

**GOVERNMENT OF GUJARAT**

**ROAD & BUILDING DEPARTMENT**

## **SPECIFICATIONS**

**Name of Work :- SR to Various Building Non  
Residential Building of Vaso and Nadiad Section  
under R & B Sub Division , Nadiad**

# **SPECIFICATIONS**

## **(A) GENERAL TECHNICAL SPECIFICATIONS**

### **1. GENERAL:**

All measurements shall be made in the metric system. Different items of work shall be measured in accordance with the procedure set forth in the relevant sections read in conjunction with General conditions of contract. The same shall not, however, apply in the case of lumpsum items. All measure- and computation unless of herwise indicated shall be carried nearest to the following limits

( i ) Length & Breadth.....	10mm.
( ii ) Height, depth or thickness of earthwork, subbase, base, surfacing and structural members.....	5 mm.
( iii ) Areas in sqm.....	0.01
(iv ) Cubic contents cum.....	0.01

In recording dimentions of work the sequence of length, width and height or depth or thickness shall be followed.

### **2. MEASUREMENTS OF LEAD FOR MATERIALS:**

Where lead is specified in the contract for construction materials. the same shall be measured as described here under.

Lead shall be measured over the shortest practicable route and not the one actually taken and decision of the Engineer- in - charge in this regard shall be taken as final. Distances upto and including 100 meters shall be measured in units of 50 meters exceeding 100 meters but riot exceeding 'I km. in units of 100 meters. and

exceeding 1 km. in units of 500 meters. The half and greater than half of the units shall be reckoned as one and less than half of the units ignored. in this regard, the source of the material shall be divided in to suitable blocks and for each block the distance from the centre of the block to the centre of placing pertaining to that block shall be taken as the lead distance.

### 3. SURFACE REGULARITY OF SUBGRADE & PAVEMENT COURSES :

The surface regularity of compacted sub base course and wearing surfaces in the longitudinal and transverse directions shall be within the tolerances indicated in table below. The longitudinal profile shall be checked with a 3m. long straight edge, at the middle of each traffic lane along a line parallel to the center line of the road. The transverse profiles shall be checked with a set of three camber boards at interval of 10 metres.

#### PERMITTED TOLERANCES OF SURFACE REGULARITY FOR PAVEMENT COURSES.

Sr.	Type of construction	Longitudinal profile with 3 metre straight edge					Cross profile
		Maximum permissible undulation in mm.	Maximum number of undulation permitted in any 300mm. length exceeding in mm.				
1	2	3	4	5	6	7	8
1.	Earth subgrade	36	30	...	...	...	15
2.	Granular / lime / cement stablised sub base	23	...	30	...	...	12
3.	Water bound macadam with nominal size metal (20-25)	18	...	...	30	...	8

	mm.						
4.	Semi-dense carpet	15	...	...	...	20	6

**Notes :**

1. These are for machine laid surface. If laid manually due to unavoidable reason, tolerances upto 50% above these values in this column may be permitted. However this relaxation does not apply to the values of maximum undulation for longitudinal and cross profiles mentioned in columns 3 and 8 in the table.
2. Surface evenness requirements in respect of both the longitudinal and cross profiles should be simultaneously satisfied.
3. **Rectification :** Where the surface irregularity of subgrade and the various pavement courses fail outside the specified tolerances the contractor shall be liable to rectify these in the manner described below and to the satisfaction of the Engineer-in Charge at his own cost.

**( i ) Sub Grade**

Where the surface is high, it shall be trimmed and suitable compacted. Where the same is low the deficiency shall be corrected by scarifying the lower layer and adding fresh material and reoccupation to the required density. The degree of compaction and the type of materials to be used shall conform to the requirements of clause 305. (MOST 1995)

**( ii ) Granular / Sub – base**

Same as at (1) above, except that the degree of compaction and the type of material to be used shall conform to the requirements of clause-401 (MOST 1995)

**( iii ) Lime / Cement stabilized soil sub base :** For lime / cement fretted materials where the Surface is high, the same shall be suitably trimmed while taking care that the material below is not disturbed due to this operation. However the surface is low the same shall be corrected as described herein below.

For cement treated material, when the time lapsed between detection of irregularity and the time of mixing of the material is less than 2 hours. the surface shall be scarified to a depth of 50 mm supplemented with freshly mixed materials as necessary and recomputed to the relevant specifications. When this time is

more than 2 hours. the full depth of the layer shall be removed from the pavement and replaced with fresh material to specification. This shall also apply to lime treated material except that the lime criteria shall be 3 hours instead of 2 hours.

**( iv ) Water Bound Macadam Base :** Where the surface is high or low, the top 75 mm shall be scarified, reshaped with added material as necessary and recomputed to clause 404. (MOST 1995) This shall also apply to wet mix macadam to clause - 406. (MOST – 1995)

**( v ) Bituminous Constructions :** For bituminous construction other than wearing course, where the surface is low, the deficiency shall be corrected by adding fresh material over a suitable tack coat if needed and recomposing to specifications. Where the surface is high, the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications. For wearing' course, where the surface is high or low, the full depth, of the layers shall be removed and replaced with fresh material and compacted to specifications. In all cases where the removal and replacement of a bituminous layer is involved, the area treated shall not be less than 5 m. in length and not less than 1 lane wide.

**( vi ) Lean Concrete Sub-base / Rolled cement concrete :**

The defective length of the course shall be removed to full depth and replaced with material conforming to clauses 601 of 603. (MOST 1995 ) as applicable. The area treated shall be at least 3 m., long, not less than 1 lane wide and extend to the full depth., before relaying the course. the disturbed sub grade or layer shall be corrected by leveling, watering and compacting.

**( vii ) Cement Concrete Pavement :** The defective areas having surface irregularity exceeding 3 mm but not greater than 6 mm may be rectified by bump cutting or scrubbling or grinding using approved equipment. When required -b the Engineer, areas which have been reduced in level by the above operation (s) shall be retextured in an approved manner either by cutting grooves (5 mm deep ) or roughening the surface by hacking the surface. If high areas is excess 6 mm or low. areas in excess of 3 mm occur, exceeding the permitted numbers if the contractor can not rectify, the slab shall be demolished and I reconstructed at the contractor's exp6nse and in no case the area removed shall be less than the full

width of the lane in which the irregularity occurs and full-length of the slab. If deemed necessary by the Engineer, any section of the slab which deviates from the specified levels and tolerances shall be demolished and reconstructed at the constructed at the contractor's expense.

#### **4. Quality Control tests during Construction :**

The materials supplied and the works carried out by the contractor shall conform to the specification prescribed in the preceding clauses. For ensuring the requisite quality of construction the materials and works shall be subjected to quality control tests, as described hereinafter. The testing frequencies set forth are the desirable minimum and the Engineer shall have the full authority to carry out additional tests as frequently as he may deem necessary, to satisfy himself that the materials and works comply with the appropriate specifications. However, the number of tests recommended in Table 7.1 may be reduced at the discretion of the Engineer if it is felt that consistency in the quality of materials can still be maintained with the reduced number of tests. Test Procedures for the various quality control tests are indicated in the respective sections of these specifications or for certain tests within this section. Where no specific testing procedure is mentioned, the tests shall be carried out as per the prevalent accepted engineering Practice to the directions of the Engineer-in-charge.

#### **Tests on Earthwork for Embank construction :**

##### **4.1 Borrow material :**

- (a) Sand content ( IS 2720 Part – IV ) two test per 8000 cum.
- (b) Plasticity Test ( IS : 2720 Part-V ) Each type to be tested, Two tests per 8000 cum. of soil.
- (c) Density test ( IS : 2720 Part VII ) Each soil type to be tested, Two tests per 8000 cum. of soil.
- (d) Moisture Content test ( IS : 2720 Part- II ) One test for every 250 cum. of soil.

##### **4.2 Compaction control :**

Control shall be exercised by taking at least one measurement of density for each 1000 sqm. Of compacted area or closer as required to yield the minimum number of test results for evaluating day's work on statistical basis. The determination of density shall be in accordance with IS : 2720 ( Part XXVIII ). Test locations shall be chosen only through random sampling techniques. Control shall not be based on the result of any one test but on the mean value of a set of 5-10 density determinations. The number of test in one set of measurements shall be 5 as long as it is felt that sufficient

control over borrow material and the method of compactions is being exercised. If considerable variations are observed between individual density results, the minimum number of tests in one set of measurement shall be increased to 10. The acceptance of work shall be subject to condition that the mean dry density equals or exceeds the specified density and the standard deviation for any set of results is below 0.08gm./cc. However for earthwork in shoulders and in top 500mm. portion of the embankment below sub grade at least one density measurement shall be taken for every 500 square metres of the compacted area provided further that the number of the tests in each set of measurement shall be at least 10 in other respects, the control shall be similar to that described earlier.

**5. Following materials shall confirm to the Indian Standards shown against them :**

- |     |                                    |           |
|-----|------------------------------------|-----------|
| (1) | Cement                             | IS : 269  |
| (2) | Sand for masonry                   | IS : 2116 |
| (3) | Sand for concrete                  | IS : 383  |
| (4) | Coarse aggregate                   | IS : 383  |
| (5) | Mild steel                         | IS : 432  |
| (6) | Hiegh Yield Strength Deformed Bars |           |
|     | (a) Hot rolled                     | IS : 1139 |
|     | (b) Cold Twisted                   | IS : 1786 |

**6. Barrel thickness of pipes of different class be as under :**

Sr. No.	Internal Diametre of pipe in mm.	Barrel thickness in mm.		
		NP 1	NP 2	NP 3
1	80	25	25	...
2	100	25	25	...
3	150	25	25	...
4	250	25	25	...
5	300	30	30	...
6	350	32	32	75
7	400	32	32	75
8	450	35	35	75
9	500	...	35	75
10	600	...	40	80
11	700	...	40	80
12	800	...	45	90
13	900	...	50	100
14	1000	...	55	100
15	1100	...	60	115
16	1200	...	65	115



## **SPECIFICATION FOR MATERIAL**

### **M – 1 :WATER :**

- 1.1 Water shall not be salty or brackish and shall be clean, reasonably clean and free from objectionable quantities of silt and traces of oil and injurious alkalis, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attach the steel in R.C.C. container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified in L.S. 456 – 1978.
- 1.2 If required by Engineer in charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in LS : 269- 1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 percent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.
- 1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surface.
- 1.4 Hard and bitter water shall not be used for curing.

1.5 Potable water will be generally found suitable for curing mortar or concrete.

### **M.3 Cement :**

3.1 Cement shall be ordinary portland slag cement as per L.S. 269-1976 or portland slag cement as per I.S. 455 – 1976.

### **M.6 Sand :**

6.1 Sand shall be natural sand, clean, well graded, hard strong durable and gritty particle free from injurious amounts of dust clay, kankar, nodules, soft or flaky particles shale, alkali, salts or organic matter, loam, mica or other deleterious substances and shall be got approved from the Engineer in charge. The same shall not contain more than 8 percent of silt as determined by field test, if necessary the sand shall be washed to make it clean.

#### **1. Coarse Sand :**

The fineness modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.0. The sieve analysis of coarse shall be as under ;

I

I.S.sieve Percentage	Percentage by weight passing sieve	I.S. sieved Designation	Percentage by weight passing sieve
4.75mm	100	600Micron	30 – 100
2.36mm	90 – 100	300 Micron	5 – 70
1.18mm	70-100	150 Micron	0 - 50

2.

**3. Fine Sand :**

The finess modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under :

I.S.sieve Percentage	Percentage by weight passing sieve	I.S. sieved Designation	Percentage by weight passing sieve
4.75mm	100	600Micron	40-85
2.36mm	100	300 Micron	5 – 50
1.18mm	70-100	150 Micron	0 – 10

**M.12 Stone Coarse Aggregate for Nominal Mix Concrete :**

- a. Coarse aggregated shall be machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- b. The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete the maximum limit may be restricted to 6mm less than the minimum lateral clear distance between bars or 6mm, less than the cover, whichever is smaller.

**TABLE**

I.S.Sieve Designation	Percentage passing for single sized aggregates of Nominal size			I.S.Sieve Designation 20mm	Percentage passing for single sized aggregates of Nominal size		
	40mm	20mm	40mm		40mm	20mm	40mm
80mm	..	..	..	12.5 mm	..	..	..
63mm	100	..	..	10 mm	0.5	0.02	0.30
40mm	85 - 100	100	..	4.75mm	...	0.50	0.05
20mm	0-20	85- 100	100	2.35mm	..	..	..
16mm	..	..	85- 100	..	..	..	..

Notes :                This percentage may be varied some what by Engineer in charge when considered

necessary for obtaining better density and strength of concrete.

- c. The grading test shall be taken in the beginning and at the change of source of materials. The necessary test indicated in I.S. 383 – 1970 and I.S. 456 – 1978 shall have to be carried out to ensure the acceptability. The aggregate shall be stored separately and handled in such a manner as to prevent the intermixing of different

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

**M.13 Black Trap Hard Stone Coarse Aggregate :**

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

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

13.1 The necessary tests indicated in I.S. 383-1978 shall have to be carried out to ensure the acceptability of the material.

13.4 If aggregate is covered with dust it shall be washed with water to make it clean.

**M.14 Brick Bats Aggregate :**

14.1 Brick bat aggregate shall be broken from well or slightly over burnt and dense brick. It shall be homogeneous in texture roughly cubical in shape, clean and free from dirt of any other foreign material. The brick bats shall be of 40mm to 50mm size unless otherwise specified in the item. The under burnt or over burnt brick bats shall not be allowed.

**M.18 Mild Steel Bars :**

18.1 Mild steel bars reinforcement for R.C.C. work shall conform to I.S. 432 ( Part-II ) 1966 and shall be of tested quality. It shall also comply with relevant part of I.S. 156-1978.

18.3 For the purpose of payment, the bar shall be measured correct upto 100mm length and weight payable worked out at the rate specified below.

1	6mm	0.22 Kg/Rmt.	8	20mm	2.47 Kg/Rmt.
2	8mm	0.39 Kg/Rmt.	9	22mm	2.98 Kg/Rmt.
3	10mm	0.62 Kg/Rmt.	10	25mm	3.85 Kg/Rmt.
4	12mm	0.89 Kg/Rmt.	11	28mm	4.83 Kg/Rmt.
5	14mm	1.21 Kg/Rmt.	12	32mm	6.31 Kg/Rmt.
6	16mm	1.58 Kg/Rmt.	13	36mm	7.99 Kg/Rmt.
7	18mm	2.00 Kg/Rmt.	14	40mm	9.86 Kg/Rmt.

#### **M.19 High Yield Strength Steel Deformed Bars :**

19.1 High Yield Strength Steel Deformed Bars be either cold twisted or hot rolled shall conform to I.S.1739-1966 and I.S. 1139-1966 respectively.

19.2 Other provision and requirements shall conform to specification

#### **M.20 High Tensile Steel Wires :**

20.1 The high tensile wires for the use in pre stressed concrete work shall conform to I.S. 2090-1962.

20.2 The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength, the minimum strength shall be taken as per Para 6.1 of I.S. 1785-1962. testing shall be done as per I.S. requirements.

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

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

#### **M.21 Mild Steel Binding Wires :**

21.1 The mild steel wire shall be of 1.63mm or 1.22mm ( 16 or 18 gauge ) diameter and shall conform to I.S. 280 – 1972.

21.2

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

## 101.INTRODUCTION

These Specifications shall apply to all such road and bridge works as are required to be executed under the Contract or otherwise directed by the Engineer-in-Charge (hereafter referred to as the Engineer). In every case, the work shall be carried out to the satisfaction of the Engineer and conform to the location, lines, dimensions, grades and cross-sections shown on the drawings or as indicated by the Engineer. The quality of materials, processing of materials as may be needed at the site, salient features of the construction work and quality of finished work shall comply with the requirements set forth in succeeding sections. Where the drawings and Specifications describe a portion of the work in only general terms, and not in complete detail, it shall be understood that only the best general practice is to prevail, materials and workmanship of the best quality are to be employed and instructions of the Engineer are to be fully complied with.

A list of Indian Roads Congress Specifications and Recommended Codes of Practice which have been made use of in the preparation of these Specifications is given at *Appendix-1*. The latest edition of all Specifications/Standards till 30 (thirty) days before the final date of submission of the tender, shall be adopted.

## 102 DEFINITIONS

The words like Contract, Contractor, Engineer (synonymous with Engineer-in-charge), Drawings, Employer, Government, Works and Work Site used in this specification shall be considered to have the meaning as understood from the definitions of these terms given in the General Conditions of Contract.

The following abbreviations shall have the meaning as set forth below:

AASHTO	:	American Association of State Highway and Transportation Officials
ASTM	:	American Society for Testing and Materials
<b>BS</b>	:	<b>British Standard published by the British Standards Institution</b>
CBR	:	California Bearing Ratio
IRC	:	Indian Roads Congress
IS	:	Indian Standard published by the Bureau of Indian Standards



### 103. MATERIALS AND TEST STANDARDS

The relevant standard for materials, as well as the testing procedures, have been indicated at appropriate places in the Specifications. A list of these standards with their full title and the year of publication applicable is included at *Appendix-2*.

### 104. SIEVE DESIGNATIONS

The sieve designation referred to in the Specifications correspond to those specified by Bureau of Indian Standards in IS: 460. Table 100-1 gives the list of the commonly used IS sieves.

**TABLE 100-1. DESIGNATION OF TEST SIEVES**

IS Designation conforming to IS: 460

(In mm)	(In micron)	
* 125	850	
106		
	*710	
* 90	600	
75		
	*500	
*63	425	
53	355	
	300	
*45		
37.5		*250
	212	
*31.5		
26.5	*180	
	150	
*22.4		
19.0	*125	
	106	
*16.0		
13.2	*90	

	75
*11.2 9.50	*63 53
*8.00 6.70	*45
*5.60 4.75	
*4.00 3.35	
*2.80 2.36	
*2.00 1.70	
*1.40 1.18	
*1.00	

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Notes: 1. >\*= are the principal sizes stated in ISO-565 and are preferred.

2. Sieve sizes given in BS:410 & ASTM-E 11 are same as in IS:460.

4. Only sieves with square openings shall be used.

## **105. SCOPE OF WORK**

**105.1.** The work to be carried out under the Contract shall consist of the various items as generally described in the Tender Documents as well as in the Bill of Quantities furnished in the Tender Documents.

**105.2** The works to be performed shall also include all general works preparatory to the construction of roads, bridges, canal crossings, drainage and all other related works. The works shall include work of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meaning of the drawings and these Specifications and further drawings and orders that may be issued by the Engineer from time to time. The scope of the work shall include compliance by the Contractor with all General Conditions of Contract, whether specifically mentioned or not in the various clauses of these Specifications, all materials, apparatus, plant, equipment, tools, fuel, water, strutting, timbering, transport, offices, stores, workshop, staff, labour and the provision of proper and sufficient protective works, diversions, temporary fencing and lighting. It shall also include: safety of workers, first-aid equipment, suitable accommodation for the staff and workmen with adequate sanitary arrangements, the effecting and maintenance of all insurances, the payment of all wages, salaries, fees, royalties, duties or other charges arising out of the erection of works and the regular clearance of rubbish, reinstatement and clearing-up of the site as may be required on completion of works, safety of the public and protection of the works and adjoining land.

**105.3.** The Contractor shall ensure that all actions are taken to build in quality assurance in the planning and execution of works. The quality assurance shall cover all the stages of work such as setting out, selection of materials, selection of construction methods, selection of equipment and plant, deployment of personnel and supervisory staff, quality control testing, etc. The work of building in quality assurance shall be deemed to be covered in the scope of the work..

**105.4.** The Contractor shall furnish, at least 15 days in advance, his programme of commencement of item of work, the method of working he intends to adopt for various items of work such as site clearance, construction for embankment, sub-base, base, surfacing, culverts, bridges, retaining walls, well-sinking, cast-in-situ piling, construction of cast-in situ prestressed concrete simply supported girders, cantilever construction of prestressed concrete superstructure, and such other items for which the

Engineer demands the submission of the method of working. He shall provide information regarding the details of the method of working and equipment he proposes to employ and satisfy the Engineer about the adequacy and safety of the same. The sole responsibility for the safety and adequacy of the methods adopted by the Contractor will, however, rest on the Contractor, irrespective of any approval given by the Engineer.

## **106.CONSTRUCTION EQUIPMENT**

In addition to the general conditions indicated in the Contract Documents, the following conditions regarding use of equipment in works shall be satisfied:

- (a) The Contractor shall be required to give a trial run of the equipment for establishing their capability to achieve the laid down Specifications and tolerances to the satisfaction of the Engineer before commencement of the work;
- (b) All equipment provided shall be of proven efficiency and shall be operated and maintained at all times in a manner acceptable to the Engineer;
- (c) All the plant/equipment to be deployed on the works shall be got approved from the Engineer for ensuring their fitness and efficiency before commencement of work;
- (d) Any material or equipment not meeting the approval of the Engineer shall be removed from the site forthwith;
- (e) No equipment will be removed from site without permission of the Engineer; and
- (f) The Contractor shall also make available the equipment for site quality control work as directed by the Engineer.

## **107. CONTRACT DRAWINGS**

**107.1.** The Contract Drawings provided for tendering purposes shall be as contained in the Tender Documents and shall be used as a reference only. The Contractor should visualise the nature and type of work contemplated and to ensure that the rates and prices quoted by him in the Bill of Quantities have due consideration of the qualitative

and quantitative variations, as may be found at the site and complexities of work involved during actual execution/construction.

**107.2.** The tendered rates/prices for the work shall be deemed to include the cost of preparation, supply and delivery of all necessary drawings, prints, tracings and negatives which the Contractor is required to provide in accordance with the Contract.

**107.3.** Two copies of drawings, on the basis of which actual execution of the work is to proceed, shall be furnished free of cost to the Contractor by the Engineer progressively according to the work programme submitted by the Contractor and accepted by the Engineer. Drawings for any particular activity shall be issued to the Contractor at least 30 days in advance of the scheduled date of the start of the activity.

**107.4.** Examination and/or approval by the Engineer of any drawings or other documents submitted by the Contractor shall not relieve the Contractor of his responsibilities or liabilities under the Contract.

## **108. SITE INFORMATION**

**108.1.** The information about the site of work and site conditions in the Tender Documents is given in good faith for guidance only but the Contractor shall satisfy himself regarding all aspects of site conditions.

**108.2.** The location of the works and the general site particulars are as generally shown on the Site plan/Index plan enclosed with the Tender Documents.

**108.3.** Whereas the right-of-way to the bridge sites/road works shall be provided to the Contractor by the Engineer, the Contractor shall have to make his own arrangement for the land required by him for site offices, labour camps, stores, etc.

**108.4.** The quarry charts enclosed with the Tender Documents indicate the location of quarries and other sources from which naturally occurring materials are available, for guidance of the Contractor. The leads indicated in the said charts are only approximate. It is assumed that the Contractor has inspected the quarries, borrow areas etc., before quoting his rates for the work to assess the availability of construction materials in required quantity and quality.

## **109. SETTING OUT**

**109.1.** The Contractor shall establish working Bench Marks tied with the Reference Bench Mark in the area soon after taking possession of the site. The Reference Bench Mark for the area shall be as indicated in the Contract Documents and the values of the same shall be obtained by the Contractor from the Engineer. The working Bench Marks shall be at the rate of four per km and also at or near all drainage structures, over-bridges and underpasses. The working Bench Marks/levels should be got approved from the Engineer. Checks must be made on these Bench Marks once every month and adjustments, if any, got agreed with the Engineer and recorded. An up-to-date record of all Bench. Marks including approved adjustments, if any, shall be maintained by the Contractor and also a copy supplied to the Engineer for his record.

**109.2.** The lines and the levels of formation, side slopes, drainage works, carriageways and shoulders shall be carefully set out and frequently checked, care being taken to ensure that correct gradients and cross-sections are obtained everywhere.

**109.3.** In order to facilitate the setting out of the works, the centre line of the carriageway or highway must be accurately established by the Contractor and approved by the Engineer. It must then be accurately referenced in a manner satisfactory to the Engineer, every 50m intervals in plain and rolling terrains and 20m intervals in hilly terrain and in all curve points as directed by the Engineer, with marker pegs and chainage boards set in or near the fence line, and a schedule of reference dimensions shall be prepared and supplied by the Contractor to the Engineer. These markers shall be maintained until the works reach finished formation level and are accepted by the Engineer.

**109.4.** On Construction reaching the formation level stage, the centre line shall again be set by the Contractor and when approved by the Engineer, shall be accurately referenced in a manner satisfactory to the Engineer by marker pegs set at the outer limits of the formation.

**109.5.** No reference peg or marker shall be moved or withdrawn without the approval of the Engineer and no earthwork or structural work shall be commenced until the centre line has been referenced.

**109.6.** The Contractor will be the sole responsible party for safe-guarding all survey monuments, bench marks, beacons, etc. The Engineer will provide the Contractor with the data necessary for setting out of the center line. All dimension and levels

shown on the drawings or mentioned in documents forming part of or issued under the Contract shall be verified by the Contractor on the site and he shall immediately inform the Engineer of any apparent errors or discrepancies in such dimensions or levels. The Contractor shall, in connection with the staking out of the centre line, survey the terrain along the road and shall submit to the Engineer for his approval, a profile along the road centre line and cross-sections at intervals as required by the Engineer.

**109.7.** After obtaining approval of the Engineer, work on earthwork can commence and the profile and cross-sections shall form the basis for measurements and payment. The Contractor shall be responsible for ensuring that all the basic traverse point are in place at the commencement of the contract and if any are missing, or appear to have been disturbed, the Contractor shall make arrangements to re-establish these points. A “Survey File” containing the necessary data will be made available for this purpose. If in the opinion of the Engineer, design modifications of the centre line or grade are advisable, the Engineer will issue detailed instructions to the Contractor and the Contractor shall perform the modifications in the field, as required, and modify the ground levels on the cross-sections accordingly as many times as required. There will be no separate payment for any survey work performed by the Contractor. The cost of these services shall be considered as being included in the cost of the items of work in the Bill of Quantities.

**109.8.** The work of setting out shall be deemed to be a part of general works preparatory to the execution of work and no separate payment shall be made for the same.

**109.9** Precision automatic levels, having a standard deviation of  $\pm 2\text{mm}$  per km, and fitted with micrometer attachment shall be used for all double run levelling work.. Setting out of the road alignment and measurement of the angles shall be done by using theodolite with traversing target, having an accuracy of one second. Measurement of distances shall be done preferably using precision instruments like Distomat.

## **110. PUBLIC UTILITIES**

**110.1.** Drawings scheduling the effected services like water pipes, sewers, oil pipelines, cables, gas ducts etc. owned by various authorities including Public Undertakings and Local Authorities included in the Contract Documents shall be verified by the Contractor for the accuracy of the information prior to the commencement of any work.

**110.2.** Notwithstanding the fact that the information on affected services may not be exhaustive, the final position of these services within the works shall be supposed to have been indicated based on the information furnished by different bodies and to the extent the bodies are familiar with the final proposals. The intermediate stage of the works are, however, unknown at the design stage, these being dictated by the Contractor's methods of working. Accordingly, the Contractor's programme must take into account the period of notice and duration of diversionary works of each body as given on the Drawings and the Contractor must also allow for any effect of these services and alterations upto the Works and for arranging regular meetings with the various bodies at the commencement of the Contract and throughout the period of the Works in order to maintain the required co-ordination. During the period of the Works, the Contractor shall have no objection if the public utility bodies vary their decisions in the execution of their proposals in terms of programme and construction, provided that, in the opinion of the Engineer, the Contractor has received reasonable notice thereof before the relevant alterations are put in hand.

**110.3.** No clearance or alterations to the utility shall be carried out unless specially ordered by the Engineer.

**110.4.** Any services affected by the Works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of the Works.

**110.5.** The Contractor may be required to carry out certain works for and on behalf of the various bodies and he shall also provide, with the prior approval of the Engineer , such assistance to the various bodies as may be authorised by the Engineer.

**110.6.** The work of temporarily supporting and protecting the public utility services during execution of the Works shall be deemed to be part of the Contract and no extra payment shall be made for the same.



**110.7.** The Contractor may be required to carry out the removal or shifting of certain service/utilities on specific orders from the Engineer for which payment shall be made to him. Such works shall be taken up by the Contractor only after obtaining clearance from the Engineer and ensuring adequate safety measures.

## **111. PRECAUTIONS FOR SAFEGUARDING THE ENVIRONMENT**

### **111.1 .General**

The Contractor shall take all precautions for safeguarding the environment during the course of the construction of the works. He shall abide by all laws, rules and regulations in force governing pollution and environmental protection that are applicable in the area where the works are situated.

### **111.2.Borrowpits for Embankment Construction**

Borrowpits shall not be dug in the right-of-way of the road. The stipulations in Clause 305.2.2. shall govern.

### **111.3. Quarry Operations**

The Contractor shall obtain materials from quarries only after the consent of the Forest Department or other concerned authorities is obtained. The quarry operations shall be undertaken within the purview of the rules and regulations in force.

### **111.4.Control of Soil Erosion, Sedimentation and Water Pollution**

The Contractor shall carry out the works in such a manner that soil erosion is fully controlled, and sedimentation and pollution of natural water courses, ponds, tanks and reservoirs is avoided. The stipulations in Clause 306 shall govern.

### **111.5.Pollution from Hot-Mix Plants and Batching Plants**

Bituminous hot-mix and concrete batching plants shall be located sufficiently away from habitation, agricultural operations or industrial establishments. The Contractor shall take every precaution to reduce the levels of noise, vibration, dust and emissions from his plant and shall be fully responsible for any claims for damages caused to the owners of property, fields and residences in the vicinity.

#### **111.6 Substance Hazardous to Health**

The Contractor shall not use or generate any material in the works which are hazardous to the health of persons, animals or vegetation. Where it is necessary to use some substances which can cause injury to the health of workers, the Contractor shall provide protective clothing or appliances to his workers.

#### **11.7. Use of Nuclear Gauges**

Nuclear gauges shall be used only where permitted by the Engineer. The Contractor shall provide the Engineer with a copy of the regulations governing the safe use of nuclear gauges he intends to employ and shall abide by such regulations.

**111.8.** The Contractor must take all reasonable steps to minimise dust nuisance during the construction of the works.

**111.9.** All existing highways and roads used by vehicle of the Contractor or any of his sub-contractors or suppliers of materials or plant, and similarly any new roads, which are part of the works and which are being used by traffic, shall be kept clean of all dust/mud or other extraneous materials dropped by the said vehicles or their tyres. Similarly, all dust/mud or other extraneous materials from the works spreading on these highways shall be immediately cleared by the Contractor.

**111.10.** Clearance shall be effected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and clearing equipment, and all dust, mud and other debris shall be removed entirely from the road surface. Additionally, if so directed by the Engineer, the road surface shall be hosed or watered using suitable equipment

**111.11** Any structural damage caused to the existing roads by the Contractor's construction equipment shall be made good without any extra cost.

**111.12** Compliance with the foregoing will not relieve the Contractor of any responsibility for complying with the requirements of any Highway Authority in respect of the roads used by him.

## **112.ARRANGEMENT FOR TRAFFIC DURING CONSTRUCTION**

### **112.1. General**

The Contractor shall at all times carry out work on the highway in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of the same. For all works involving improvements to the existing highway, the Contractor shall, in accordance with the directives of the Engineer, provide and maintain, during execution of the work, a passage for traffic either along a part of the existing carriageway under improvement, or along a temporary diversion constructed close to the highway. The Contractor shall take prior approval of the Engineer regarding traffic arrangements during construction.

### **112.2 Passage of Traffic along a part of the Existing Carriageway under Improvement**

For widening/strengthening existing carriageway where part width of the existing carriageway is proposed to be used for passage of traffic, treated shoulders shall be provided on the side on which work is not in progress. The treatment to the shoulder shall consist of providing atleast 150 mm thick granular base course covered with bituminous surface dressing in a width of atleast 1.5 m and the surface shall be maintained throughout the period during which traffic uses the same to the satisfaction of the Engineer. The continuous length in which such work shall be carried out, would be limited normally to 500 m at a place. However, where work is allowed by the Engineer in longer stretches passing places atleast 20m long with additional paved width of 2.5 m shall be provided at every 0.5 km interval.

In case of widening existing two-lane to four-lane, the additional two lanes would be constructed first and the traffic diverted to it and only thereafter the required treatment to the existing carriageway would be carried out. However, in case where on the request of the Contractor, work on existing two-lane carriageway is allowed by the Engineer with traffic using part of the existing carriageway, stipulations as in para above shall apply.

After obtaining permission of the Engineer, the treated shoulder shall be dismantled, the debris disposed of and the area cleared as per the direction of the Engineer.

### **112.3 Passage of Traffic along a Temporary Diversion**

In stretches where it is not possible to pass the traffic on part width of the carriageway, a temporary diversion shall be constructed with 7 m carriageway and 2.5 m earthen shoulders on each side (total width of roadway 12 m ) with the following provision for road crust in the 7 m width:

- (i) 200 mm (compacted) granular subbase;
- (ii) 225 mm (compacted) granular base course; and
- (iii) Premix carpet with Seal Coat/Mix Seal Surfacing.

The alignment and longitudinal section of diversion including junctions and temporary cross drainage provision shall be as approved by the Engineer.

### **112.4 Traffic Safety and Control**

The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as may be required by the Engineer for the information and protection of traffic approaching or passing through the section of the highway under improvement . Before taking up any construction, an agreed phased programme for the diversion of traffic on the highway shall be drawn up in consultation with the Engineer.

The barricades erected on either side of the carriageway/portion of the carriageway closed to traffic, shall be of strong design to resist violation, and painted with alternate black and white stripes. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path (whether on temporary diversion or part width of the carriageway) the channel for traffic shall be clearly marked with the aid of pavement markings, painted drums or a similar device to the directions of the Engineer. At night, the passage shall be delineated with lanterns or other suitable light source.

One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns/lights.

On both sides, suitable regulatory/warning signs as approved by the Engineer shall be installed for the guidance of road users. On each approach, at least two signs shall be put up, one close to the point where transition of carriageway begins and the other 120 m away. The signs shall be of approved design and of refractory type, if so directed by the Engineer.

### **112.5. Maintenance of Diversions and Traffic Control Devices**

Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required as directed by the Engineer. The temporary travelled way shall be kept free of dust by frequent applications of water, if necessary.

**Item No. 1 : Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(A) Loose or soft soil**

The work shall be executed as per the specification of "Item No. 4.0.0. (A) Page No. 29 "of attached Building Specification Booklet.

Payment shall be made on **Cum** basis

**Item No. 2 : Excavation for foundation for depth from 1.5 m to 3.0 m including sorting out and stacking of useful materials and disposing off the excavated stuff up to 50 Meter lead.(A) Loose or soft soil**

The work shall be executed as per the specification of "Item No. 4.0.0. (A) Page No. 29 "of attached Building Specification Booklet.

Payment shall be made on **Cum** basis

**Item No. 3:- Providing and laying cement concrete 1:4:8 (1- Cement : 4- coarse sand : 8- hand broken stone aggregates 40 mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth**

The work shall be executed as per the specification of "Item No. 5.3.3(A) Page No. 38" of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 4 : Providing and laying cement concrete work 1:2:4 (1- Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size) and curing complete excluding cost of formwork and reinforcement for reinforced concrete work in (A) Foundations, footings, Base or columns and Mass concrete**

The work shall be executed as per the specification of "Item No. 5.3.13. Page No. 40 " of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 5 : Providing and laying cement concrete work 1:2:4 (1- Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size) and curing complete excluding cost of formwork and reinforcement for reinforced concrete work in (D) Columns, Pillars posts and struts upto floor two level.**

The work shall be executed as per the specification of "Item No. 5.3.13. Page No. 40 " of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 6 : Filling available excavated earth (excluding rock) in trenches. plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposed layer by ramming and watering**

The work shall be executed as per the specification of "Item No. 4.12. Page No. 35 " of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 7 : Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:6 (1- Cement : 6 -fine sand)(A) Modular**

The work shall be executed as per the specification of "Item No.6.12 Page No. 51" of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 8 : 20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.**

**1.0. Materials**

1.1. Water shall conform to M-1. Cement mortar shall conform to M-11.

**2.0. Workmanship**

2.1. The work shall be carried out in the coats. The backing coat (base coat) shall be 12 mm. thick in C.M. 1:3. The relevant specifications of item No. 17.58(I) shall be followed except that the thickness of back coat shall be 12 mm. average. Before the first coat hardens its surface shall be beaten up by edges of wooden tapers and close dents shall be made on the surface. The subsequent coat shall be applied after this coat has been allowed to set for 3 to 5 days, depending upon the weather conditions. The surface shall not be allowed to dry during this period.

2.2. The second coat shall be completed to 8 mm. thickness in C.M. 1:1 as described above, including raising sand facing by bushing. The sample of sand face shall be got approved before the work is started. The whole work shall be carried out uniformly as per sample approved.

2.3. Curing :

The curing shall be started overnight after finishing of plaster. The plaster shall be kept wet for a period of 7 days. During this period, it shall be protected from all damages.

**3.0. Mode of measurement & payment**

3.1. The relevant specifications of item No. 17.58 shall be followed except that the sand face plaster on outside up to 10 m. above ground level shall be measured under this item.

**3.2. The rate shall be for a unit of One sq. meter.**

**Item No. 9 : Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials. etc complete**

**1.0. Materials**

Water shall be conforming M-1. The plastic emulsion shall conform to I.S.: 5411-1969 (part- I).

**• Workmanship**

• Scaffolding: The relevant specifications of item-No. 18.11 Para 2.1 shall be followed.

• Preparation of surface: The relevant specification of item No. 18.44 Para 2.2 shall be followed.

**• Preparation of Mix :**

This shall be done as per manufacturer's instructions. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added shall be as per manufacturer instructions.

**• Application:**

• Before pouring into small containers for use, the paint shall be stirred thoroughly in item container. When applying also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

• The paint shall be laid on evenly and smoothly by means of crossing and laying off the crossing and consist of covering the area over with paint, brushing the surface hard for the first time over and then, brushing alternately in opposite direction two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush Marks shall be left after the laying off is finished. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of moldings, etc. shall be left on the work. The full process of crossing and laying off will constitute one coat.

• The paint shall be applied with brush or rollers. For undecorated surfaces, the surface shall be treated with minimum two coats of cement water proofing paint. The second or subsequent coat shall not be started until the proceeding coat as become sufficiently hard to resist marking by brushing being used.

2.4.4. The surface on finishing shall present a flat velvety smooth finish. It shall be even and uniform in shade without patches, brush marks, paint drops etc.

**2.5. Precautions:**

xix. Old brushes if they are to be used with emulsion paints, shall be completely dried of turpentine or oil paint by washing in warm soap water. Brushes shall be quickly washed in water immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush.

xx. In the preparation of wall for plastic emulsion painting, no oil base paints shall be used in filling cracks, holes etc.

xxi. Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

xxii. Washing of surfaces treated with emulsion paint shall not be done within 3 to 4 weeks of application

2.6. Protective payment: The relevant specifications of item No. 18.11 shall be followed.

- Mode of measurements and payment
- The relevant specifications of item No. 18.11 shall be followed.
- The rate shall be for a unit of **One sq. meter**.

## **Item No. 10 : Providing TMT Bar FE 500D reinforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level**

### **1.0. GENERAL**

This work shall consist of furnishing and placing coated, or uncoated or high strength deformed reinforcement, bars (intentioned) of the shape and dimensions shown on the drawings and conforming to these specifications or as approved by the Engineer in charge.

### **2.0. MATERIAL**

**2.1. T.M.T. Bars** Reinforcements may be either T.M.T. tensile steel, conforms to IS 1786-2008 bars. They may be uncoated or coated with epoxy or with approved protective coatings.

**2.2.** T.M.T. bars reinforcement for R.C.C. work shall conform IS 432 (Part II) 1982 (Reaffirmed 1995) and shall be of tested quality. It shall also comply with relevant part of IS 456-2000.

**2.3.** All reinforcement shall be clean and free from dirt, paint, grease or oil, all scale or loose or thick rust at the time of placing.

**2.4.** All steel shall be procured from original producers no re-rolled steel shall be incorporated in the work.

**2.5.** Only new steel shall be delivered to the site every bar shall be inspected before placing to its position and defective brittle or burnt bar shall be discarded cracked ends of bars shall be discarded.

### **3.0. Pitch**

**3.1.** Distance between bars shall be as specified in drawings and as directed by the Engineer in charge all bars shall be placed at an accurate distance from each other and shall be bind tightly to maintain the desired pitch Suitable means shall be provided for holding bars securely in position.

### **4.0. Binding wire**

**4.1.** Mild steel binding wire shall be of 1.63 mm or 1.22 mm (16 to 18 gauge) diameter and shall conform IS 280-2006.

**4.2.** The use of black wire will be permitted for binding reinforcement bars. It shall be free from dirt, paint, grease or oil, oil scale or loose or thick rust and any other undesirable coating which may prevent adhesion of cement mortar at the time of binding.

**4.3.** Only new binding wire shall be delivered to the site all binding wire shall be inspected before binding to its position and defective brittle, rusted, used wire, shall be discarded.

### **5.0. PROTECTION OF REINFORCEMENT**

**5.1.** Uncoated reinforcing steel shall be protected from rusting or chloride contamination. Reinforcements shall be free from rust, mortar, loose mill scale, grease, oil or paints. This may be ensured either by using reinforcement fresh from the factory or thoroughly cleaning all reinforcement to remove rust using any suitable method such as sand blasting, mechanical wire brushing, etc. as directed by the Engineer. Reinforcements shall be stored on bricks, racks or platforms and above the ground in a clean and dry condition and shall be suitably marked to facilitate inspection and identification.

**5.2.** Portions of uncoated reinforcing steel and dowels projecting from concrete shall be protected within one week after initial placing of concrete with a brush coat of neat cement mixed with water to a consistency, of thick paint. This coating shall be removed by lightly tapping with a hammer or other tool not more than one week before placing<sup>32</sup> of the adjacent pour of concrete. Coated



reinforcing steel shall be protected against damage to the coating. If the coating on the bars is damaged during transportation or handling and cannot be repaired, the same shall be rejected.

#### **6.0. Workmanship**

**6.1.** The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed by The Engineer in charge.

**6.2.** Reinforcing steel shall conform accurate to the dimensions given in the bar bending schedules shown on relevant drawing

#### **7.0. BENDING OF REINFORCEMENT**

**7.1.** Bar bend g schedule shall be furnished by the Contractor and got approved by the Engineer before start of work.

**7.2.** Reinforcing steel shall conform to the dimensions and shapes given in the approved bar bending Schedules.

**7.3.** Bars shall be bent cold to the specified shape and dimensions or directed by the Engineer using a proper bar bender operated by hand power to obtain the correct radius of bends and shape.

Bars shall not be bent or straightened in a manner that will damage parent material or the coating bars bent during transport or handling shall, be straightened before being used on work and shall not be heated to facilitate straightening.

#### **8.0. PLACING OF REINFORCEMENT**

**8.1.** The reinforcement cage should generally be fabricated in the yard at ground level, and then shifted and placed in position. The reinforcement shall be placed strictly, in accordance with the drawings and shall be assembled in position, only when structure is otherwise ready for placing of concrete. Prolonged time gap, between assembling of reinforcements and casting of concrete, which may result in rust formation on the surface, shall not be permitted.

**8.2.** Reinforcement bars shall be placed accurately in position as shown on the drawings. The bars, crossing one another shall be tied together at every intersection with binding wire (annealed), conforming to IS:280 to make the skeleton of the reinforcement rigid such that the reinforcement does not get displaced during placing of concrete, or any other operation. The diameter of binding wire shall not be less than 1 mm.

#### **8.3. Bars shall be kept in position usually by the following methods:**

In case of beam and slab construction, industrially produced polymer cover blocks of thickness equal to the specified cover shall be placed between the bars and formwork subject to Satisfactory evidence that the polymer composition is not harmful to concrete and reinforcement. Cover blocks made of concrete may be permitted by the Engineer, provided they have the same strength and specification as those of the member.

**8.4.** In case of dowels for Columns and walls the vertical reinforcement shall be kept in position by means of timber templates with slots in them accurately, or with cover blocks tied to the reinforcement timber templates shall be removed after the concreting has progressed up to a level just below their location.

**8.5.** Layers of reinforcements shall be separated by spacer bars at approximately One meter intervals. The minimum diameter of spacer bars shall be 12 mm or: equal to maximum size of main reinforcement or maximum size of coarse aggregate, whichever is greater. Horizontal reinforcement shall not be, allowed to sag between supports.

**8.6.** Necessary stays, blocks, metal chairs, spacers, metal hangers supporting wires etc, or other subsidiary, reinforcement shall be provided to fix the reinforcements firmly in its correct position.

**8.7.** Use of pebbles, broken stone, metal pipe, brick, mortar or wooden blocks etc as devices for positioning reinforcement shall not be permitted.

**8.8.** Bars coated with epoxy or any other approved protective coating shall be placed on supports that do not damage the coating. Supports shall be installed in a manner such that planes of weakness are not created in hardened concrete. The coated reinforcing steel shall be held in place by use of plastic or plastic coated binding wires especially manufactured for the purpose.

**8.9.** Placing and fixing of reinforcement shall be inspected and approved by the Engineer before concrete is deposited.

#### **9.0. Lapping**

**9.1.** All reinforcement shall be furnished in full lengths as indicated on the drawing. No splicing of bars, except where shown on the drawing; will be permitted without approval of the Engineer. The lengths of the splice shall be as indicated on drawing or as approved by the Engineer. Where practicable, overlapping bars shall not touch each other, and shall be kept apart by 25 mm or 1 1/4

times the maximum size of coarse aggregate, whichever is greater, If this is not feasible, overlapping bars shall be bound with annealed steel binding wire, not less than 1 mm diameter and twisted tight in such a manner as to maintain minimum clear cover to the reinforcement from the concrete surface. Lapped splices shall be staggered or located at points, along the span where stresses are low.

#### **10.0. Welding**

**10.1** Splicing by welding of reinforcement will be permitted only if detailed on the drawing or approved by the Engineer. Weld shall develop an ultimate strength equal to or greater than that of the bars connected.

**10.2.** While welding may be permitted for T.M.T. reinforcing bars conforming to IS:432, welding of deformed bars conforming to IS: 1786 shall in general be prohibited. Welding may be permitted in case of bars of other than S 240 grade including special. Welding grade of S 415 grade bars conforming to IS:1786, for which necessary chemical analysis has been secured and the carbon equivalent (CE) calculated from the chemical composition using the formula:

$$CE = \frac{C}{100} + \frac{Mn}{100} + \frac{Cr}{100} + \frac{Mg}{100} + \frac{V}{100} + \frac{Ni}{100} + \frac{Cu}{100}$$

6 5 15

is 0.4 or less.

**10.3.** The method of welding shall conform to IS:2751 and IS:9417 and to any supplemental specifications to the satisfaction of the Engineer

**10.4.** Bars shall be bent cold to the specified shape and dimensions or as directed by Engineer in charge using the proper bender tool, operated by hand or power to attain proper radius of bends. Bars shall not be bend or straightened in a manner that will injure the material. Bars bent during transport or handling shall be straightened before being used in the work. Bars shall not be heated to facilitate bending

**10.5.** Unless otherwise specified a 'U' type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bane shall not be less then twice the diameter of the round bar and the length of the straight part of the bar beyond the end of the curve shall be at least four times of the diameter of the round bar. In case of bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The hooks shall be suitably encased to prevent any spiting of the concrete

**0.6.** All reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm in size and by using say blocks or metal chairs spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals, Bars shall not be allowed to sag between supports not displaced during concreting or any other operations of the work All devices used for positioning shall be of not corrodible material wooden and metal supports shall not extended to the surface of the concrete, except where shown in drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not be allowed. Pieces of broken stone or brick and wooden blocs shall not be used Layers of bars shall be separated by spacer bars pre-cast mortar blocks or other approved devices. Reinforcement after bending placed in position shall be maintained in a clean condition until completely embedded in concrete, Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement form corrosion, concrete cover shall be provided as indicated on drawings. All bars protruding from concrete and to which other bars are to be sliced and which are likely to be exposed for a period exceeding 10 days shall be protected by a thick coat of neat cement grout

**10.7.** Bars crossing each other where required shall be secured by binding wire (annealed) of size not less than 1 mm in such a manner that they do not slip over at the time of fixing and concreting As far possible bars of full length shall be used in case this is not possible, overlapping of bars shall be done as directed by the Engineer in charge When practicable overlapping bars shall not touch each other, but be kept apart by 25 mm Where no feasible overlapping bars shall be bound with annealed wires not less than 1 mm thick twisted tight The overlaps shall be staggered for different bars and located at points along the span where neither sheer not bending moments is maximum.

**10.8.** Whenever indicated on drawing or desired the Engineer in charge bars shall bejointed by coupling which shall have a cross section sufficient to transmit the full stresses of bars The end of the bars that are jointed by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than the normal cross section of the bar. Threads shall be standards threads Steel for coupling shall conform to IS 226

**10.9.** When permitted or specified on the drawings joints of reinforcement bars shall butt-welded so as to transmit their full stresses Welded joints shall preferably be located at points when steel will not be subject to more than 75 percent of the maximum permissible stresses and welds so staggered that at any one section not more than 20 percent of the rods are welded Only electric arc welding using a process which excludes air from the molten metal and conforms to any or other special provisions for the work shall be accepted Suitable means shall be provided for holding bars securely in position during welding It shall be ensured that no voids are left in welding and when welding is done in two or three stages previous surface shall be cleaned properly Ends of bars shall be cleaned of all loose scale rust stages paint and other foreign matter before welding Only competent welders shall be employed on the work. The M S electrodes used for welding shall conform IS 814 Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number shall frequency to test shall be as directed by the Engineer in charge

#### **11.0 MODE OF MEASUREMENTS & PAYMENT**

**11.1.** For the purpose of payment the bar shall be measured correct up to 10 mm length and weight payable works out at the rate specified below

<b>Sr. No</b>	<b>Diameter of steel</b>	<b>weight of steel per running meter</b>	<b>Sr. No</b>	<b>Diameter of steel</b>	<b>weight of steel per running meter</b>
<b>1</b>	<b>6 mm</b>	<b>0.22 Kg / Rmt</b>	<b>8</b>	<b>20 mm</b>	<b>2.47 Kg / Rmt</b>
<b>2</b>	<b>8 mm</b>	<b>0.39 Kg / Rmt</b>	<b>9</b>	<b>22 mm</b>	<b>2.98 Kg / Rmt</b>
<b>3</b>	<b>10 mm</b>	<b>0.62 Kg / Rmt</b>	<b>10</b>	<b>25 mm</b>	<b>3.85 Kg / Rmt</b>
<b>4</b>	<b>12 mm</b>	<b>0.89 Kg / Rmt</b>	<b>11</b>	<b>28 mm</b>	<b>4.83 Kg / Rmt</b>
<b>5</b>	<b>14 mm</b>	<b>1.21 Kg / Rmt</b>	<b>12</b>	<b>32 mm</b>	<b>6.31 Kg / Rmt</b>
<b>6</b>	<b>16 mm</b>	<b>1.58 Kg / Rmt</b>	<b>13</b>	<b>36 mm</b>	<b>7.99 Kg / Rmt</b>
<b>7</b>	<b>18 mm</b>	<b>2.00 Kg / Rmt</b>	<b>14</b>	<b>40mm</b>	<b>9.86 Kg / Rmt</b>

**11.1.** Excess consumption over 5% will be charged at penal rate.

**11.2.** Reinforcement shall be measured in length including hooks, if any, separately for different diameters as actually used in work, excluding overlaps. From the length so measured, the weight of reinforcement shall be calculated in tonnes on the basis of IS: 1732. Wastage, overlaps, couplings, welded joints, spacer bars, chairs, stays, hangers and annealed steel wire or other methods for binding and placing shall not be measured and cost of these items shall be deemed to be included in the rates for reinforcement..

**11.3.** The contract unit rate for coated/uncoated reinforcement shall cover the cost of material, fabricating, transporting, storing, bending, placing, binding and fixing in position as shown on the drawings as per these specifications and as directed by the Engineer, including all labour, equipment, supplies, incidentals, sampling, testing and supervision.

The unit rate for coated reinforcement shall be deemed to also include cost of all material, labour, tools and plant, royalty, transportation and expertise required to carry out the work. The rate shall also cover sampling, testing and supervision required for the work.

**11.4.** The rate shall be for a unit of **one KG**.

**Item No. 11 : Earthwork for embankment including breaking clods, dressing with all lead and lift and including watering rolling and consolidation of subgrade in layers at O.M.C. to required dry density including filling the depression which occur during the process using power roller 8T to 10T.(E) From Borrow area within 3.0KM. lead**

### **305 EMBANKMENT CONSTRUCTION**

#### **305.1 General:**

##### **305.1.1 Description:**

These Specifications shall apply to the construction of embankments including sub grades, earthen shoulders and miscellaneous backfills with approved materials obtained from roadway and drain excavation, borrow pits or other sources. All embankments, sub grades, earthen shoulders and miscellaneous backfills shall be constructed in accordance with the requirements of these specifications and in conformity with the lines, grades, and cross-sections shown on the drawings or as directed by the Engineer.

#### **305.2 Materials and General Requirements.**

##### **305.2.1 Physical requirements:**

**305.2.1.1** The materials used in embankments, sub grades, earthen shoulders and miscellaneous backfills shall be soil, murrum, gravel, a mixture of these or any other material approved by the Engineer. Such materials shall be free of logs, stumps, roots, rubbish or any other ingredient likely to deteriorate or affect the stability of the embankment sub grade.

The following types of material shall be considered unsuitable for embankment:

- (a) Materials from swamps, marshes and bogs;
- (b) Peat, log, stump and perishable material; and soil that classifies as OL, OI, OH or Pt in accordance with IS:1498;
- (c) Materials susceptible to spontaneous combustion;
- (d) Materials in a frozen condition;
- (e) Clay having liquid limit exceeding 50 and plasticity index exceeding 25; and
- (f) Materials with salts resulting in leaching in the embankment.

**305.2.1.2** Expansive clay exhibiting marked swell and shrinkage, properties ("free swelling index" exceeding 50 percent when tested as per IS:2720-Part 40) shall not be used as a fill material. Where an expansive clay with acceptable "free swelling index" value is used as a fill material, sub grade and top 500mm portion of the embankment just below sub grade shall be non-expansive in nature.

**305.2.1.3** Any fill material with a soluble sulphate content exceeding 1.9 grams of sulphate (expressed as  $\text{SO}_3$ ) per liter when tested in accordance with BS:1377 Part-3, but using a 2:1 water-soil ratio shall not be deposited within 500 mm or other distance described in the Contract), permanent works constructed out of concrete, cement bound materials or other cementations materials.

Materials with a total sulphate content (expressed as  $\text{SO}_3$ ) exceeding 0.5 per cent by mass, when tested in accordance with BS: 1377, Part 3 shall not be deposited within 500 mm or other distances described in the contract, of metallic items forming part of the Permanent Works.

**305.2.1.4** The size of the coarse material in the mixture of earth shall ordinarily not exceed 75mm when being placed in the embankment and 50 mm when placed in the sub grade. However, the Engineer may at his discretion permit the use of material coarser than this also if he is satisfied that the same will not present any difficulty as regards the placement of fill material and its compaction to the requirements of these specifications. The maximum particle size shall not be more than two-thirds of the compacted layer thickness

**305.2.1.5** Ordinarily, only the materials satisfying the density requirements given in Table 300-1 shall be employed for the construction of the embankment and the sub grade.

#### **TABLE 300-1. DENSITY REQUIREMENTS OF EMBANKMENT AND SUBGRADE MATERIALS**

Sr. No. Type of work Maximum laboratory dry unit weight when tested as per IS:2720(Part 8)

1. Embankments up to 3 metres height, not subjected to extensive flooding. Not less than 15.2 kN/cum.

2. Embankments exceeding 3 metres height or embankments of any height subject to long periods of inundation. Not less than 16.0 kN/cu.m.

### 3. Subgrade and earthen shoulders/ Not less than 17.5 kN/cu.m. Verges/backfill

Notes: (1) This Table is not applicable for lightweight fill materials e.g. cinder, fly ash etc.  
(2) The materials to be used in sub grade shall be non-expensive and shall satisfy design CBR at the specified dry density and moisture content. In case the available materials fail to meet the requirement of CBR, use of stabilization methods in accordance with Clause 403 and 404 or by any stabilization method approved by the Engineer shall be followed.

**305.2.1.6** The materials to be used in sub grade shall conform to the design CBR value at the specified dry density and moisture content of the test specimen. In case the available materials fail to meet the requirement of CBR, use of stabilization methods in accordance with Clause 403 and 404 or by any stabilization method approved by the Engineer or by the IRC Association Committee shall be followed.

**305.2.1.7** The materials to be used in high embankment construction shall satisfy the specified requirements of strength parameters.

#### **305.2.2 General Requirements:**

**305.2.2.1** The materials for embankment shall be obtained from approved sources with preference given to materials becoming available from nearby roadway excavation or any other excavation under the same Contract.

The work shall be so planned and executed that the best available materials are saved for the sub grade and the embankment portion just below the sub grade.

#### **305.2.2.2 Borrow materials:**

The arrangement for the source of supply of the materials for embankment and sub grade and compliance with the guidelines, and environmental requirements, in respect of excavation and borrow areas as stipulated, from time to time by the Ministry of Environment and Forests, Government of India and the local bodies, as applicable, shall be the sole responsibility of the Contractor.

Borrow pits along the road shall be discouraged. If permitted by the Engineer, these shall not be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300m. Small drains shall be cut through the ridges to facilitate drainage. The depth of the pits shall be so regulated that their bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontals projected from the edge of the final section of the bank, the maximum depth in any case being limited to 1.5 m. Also, no pit shall be dug within the offset width of a minimum of 10 m.

Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plant is operating at the place of deposition.

Where the excavation reveals a combination of acceptable and unacceptable materials, the Contractor shall, unless otherwise agreed by the Engineer, carry out the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the unacceptable materials. The acceptable materials shall be stockpiled separately.

The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants or sitting of temporary buildings or structures.

#### **305.2.2.3 Fly-Ash**

User of fly-ash shall conform to the Ministry of Environment and Forest guidelines. Where fly-ash is used the embankment construction shall conform to the physical and chemical properties and requirements of IRC: SP:38-2001, "Guidelines for Use of Fly ash in Road Construction". The term fly-ash shall cover all types of coal ash such as ponds ash, bottom ash or mound ash. Embankment constructed out of fly ash shall be properly designed to ensure stability and protection against erosion in accordance with IRC guidelines. A suitable thick cover may preferably be provided at intervening layers of pond ash for this purpose. A thick soil cover shall bind the edge of the embankment to protect it against erosion. Minimum thickness of such soil cover shall be 500mm.

#### **305.2.2.4 Compaction Requirements**

The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing programme approved by the Engineer. It shall be ensured that the sub grade material when compacted to the density requirements as in Table 300-2 shall yield the design CBR value of the sub grade.

## **TABLE 300-2. COMPACTION REQUIREMENTS FOR EMBANKMENT AND SUBGRADE.**

Type of work/material Relative compaction as percentage of max. laboratory dry density as per IS:2720 (Part 8)

1. Sub grade and earthen shoulders Not less than 97%

2. Embankment Not less than 95%

3. Expansive Clays

a) Sub grade and 500mm.portion Not allowed.

Just below the sub grade.

b) Remaining portion of embankment Not less than 90-95%

The Contractor shall at least 7 working days before commencement of compaction submit the following to the Engineer for approval:

(i) The values of maximum dry density and optimum content obtained in accordance with IS:2720 (Part 8), appropriate for each of the fill materials he intends to use.

(ii) A graph of density plotted against moisture content from which each of the values in (i) above of maximum dry density and optimum moisture content were determined.

The maximum dry density and optimum moisture content approved by the Engineer; it shall form the basis for compaction.

305.3 Construction Operations:

### **305.3.1 Setting Out**

After the site has been cleared to Clause 201, the work shall be set out to Clause 301.3.1. The limits of embankment/sub grade shall be marked by fixing batter pegs on both sides at regular intervals as guides before commencing the earthwork. The embankment/sub grade shall be built sufficiently wider than the design dimension so that surplus material may be trimmed, ensuring that the remaining material is to be desired density and the position specified and conforms to the specified side slopes.

### **305.3.2 Dewatering**

If the foundation of the embankment is in an area with stagnant water, and in the opinion of the Engineer it is feasible to remove it, the same shall be removed by bailing out or pumping, as directed by the Engineer and the area of the embankment foundation shall be kept dry. Care shall be taken to discharge the drained water so as not to cause damage to the works, crops or any other property. Due to any negligence on the part of the Contractor, if any such damage is caused, it shall be the sole responsibility of the Contractor to repair. /Restore it to original condition or compensate the damage at his own cost.

If the embankment is to be constructed under water, Clause 305.4.6 shall apply.

### **305.3.3 Stripping and Storing topsoil**

In localities where most of the available embankment materials are not conducive to plant growth, or when so directed by the Engineer, the topsoil from all areas of cutting and from all areas to be covered by embankment foundation shall be stripped to specified depths not exceeding 150 mm and stored in stockpiles of height not exceeding 2 m for covering embankment slopes, cut slopes and other disturbed areas where re-vegetation is desired. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum.

### **305.3.4 Compacting ground supporting embankment/Sub grade:**

Where necessary, the original ground shall be leveled to facilitate placement of first layer of embankment, scarified, mixed with water and then compacted by rolling in accordance with Clause 305.3.5 and 305.3.6 so as to achieve minimum dry density as given in Table 300-2.

In case where the difference between the sub grade level (top of the sub grade on which pavement rests) and ground level is less than 0.5 m and the ground does not have 97 per cent relative compaction with respect to the dry density as given in Table 300-2, the ground shall be loosened up to a level 0.5m below the sub grade level, watered and compacted in layers in accordance with Clauses 305.3.5 and 305.3.6 to achieve dry density not less than 97 percent relative compaction as given in Table 300-2.

Where so directed by the Engineer, any unsuitable material occurring in the embankment foundation (500mm portion just below the sub-grade) shall be removed and replaced by approved materials laid in layers to the required degree of compaction.

Any foundation treatment specified for embankments especially high embankments, resting on suspect foundations as revealed by borehole logs shall be carried out in a manner and to the depth as desired by the Engineer. Where the ground on which an embankment is to be built has

any of the material types (a) to (f) in Clause 305.2.1, at least 500 mm of such material must be removed and replaced by acceptable fill material before embankment construction commences.

### **305.3.5 Spreading material in layers and bringing to appropriate moisture content**

**305.3.5.1** The embankment and sub grade material shall be spread in layers of uniform thickness in the entire width with a motor grader. The compacted thickness of each layer shall not be more than 250mm when vibratory roller / vibratory soil compactor is used and not more than 200 mm when 80-100 kN static roller is used. The motor grader blade shall have hydraulic control suitable for initial adjustment and maintain the same so as to achieve the specific slope and grade. Successive layers shall not be placed until the layer under construction has been thoroughly compacted to the specified requirements as in Table 300-2 and got approved by the Engineer. Each compacted layer shall be finished parallel to the final cross-section of the embankment.

**305.3.5.2** Moisture content of the material shall be checked at the site of placement prior to commencement of compaction; if found to be out of agreed limits, the same shall be made good. Where water is required to be added in such constructions, water shall be sprinkled from a water tanker fitted with sprinkler capable of applying water uniformly with a controllable rate of flow to variable widths of surface but without any flooding. The water shall be added uniformly and thoroughly mixed in soil by balding, dicing or barrowing until a uniform moisture content is obtained throughout the depth of the layer.

If the material delivered to the roadbed is too wet, it shall be dried, by aeration and exposure to the sun, till the moisture content is acceptable for compaction. Should circumstances arise, where owing to wet weather, the moisture content can not be reduced to the required amount by the above procedure, compaction work shall be suspended.

Moisture content of each layer of soil shall be checked in accordance with IS:2720 (Part 2), and unless otherwise mentioned, shall be so adjusted, making due allowance for evaporation losses, that at the time of compaction it is in the range of 1 per cent above to 2 per cent below the optimum moisture content determined in accordance with IS:2720 (Part 8) as the case may be. Expansive clays shall, however, be compacted at moisture content corresponding to the specified dry density, but on the wet side of the optimum moisture content obtained from the laboratory compaction curve.

After adding the required amount of water, the soil shall be processed by means of graders, harrows, rotary mixers or as otherwise approved by the Engineer until the layer is uniformly wet. Clods or hard lumps of earth shall be broken to have a maximum size of 75 mm when being placed in the embankment and a maximum size of 50 mm when being placed in the sub grade.

**305.3.5.3** Embankment and other areas of fill shall, unless otherwise required in the Contract or permitted by the Engineer, be constructed evenly over their full width and their fullest possible extent and the Contractor shall control and direct construction plant and other vehicular traffic uniformly over them. Damage by construction plant and other vehicular traffic shall be made good by the Contractor with material having the same characteristics and strength as the material had before it was damaged.

Embankments and other areas of unsupported fills shall not be constructed with steeper side slopes, or to greater widths than those shown in the Contract, except to permit adequate compaction at the edges before trimming back, or to obtain the final profile following any settlement of the fill and the underlying material.

Whenever fill is to be deposited against the face of a natural slope, or sloping earthworks face including embankments, cutting, another fills and excavations steeper than 1 vertical on 4 horizontals, such faces shall be benched as per Clause 305.4.1 immediately before placing the subsequent fill.

All permanent faces of side slopes of embankments and other areas of fill formed shall, subsequent to any trimming operations, be reworked and sealed to the satisfaction of the Engineer by tracking a tracked vehicle, considered suitable by the Engineer, on the slope or any other method approved by the Engineer.

### **305.3.6 Compaction**

Only the compaction equipment approved by the Engineer shall be employed to compact the different material types encountered during construction. Static three wheeled roller, self propelled single drum vibratory roller, tandem vibratory roller, pneumatic type roller, pad foot roller etc. of suitable size and capacity as approved by the Engineer shall be used for the different types and grades of materials required to be compacted either individually or in suitable combinations.

The compaction shall be done with the help of self-propelled single drum vibratory roller or pad foot vibratory roller of 80 to 100 kN static weight or heavy pneumatic type roller of adequate capacity capable of achieving the required compaction. The contractor shall demonstrate

the efficacy of the equipment he intends to use by carrying out compaction trials. The procedure to be adopted for these site trials shall be submitted to the Engineer for approval. Earthmoving plant shall not be accepted as compaction equipment nor shall the use of a lighter category of plant to provide any preliminary compaction to assist the use of heavier plant be taken into account.

Each layer of the material shall be thoroughly compacted to the densities specified in Table 300-2. Subsequent layers shall be placed only after the finished layer has been tested according to Clause 903.2.2 and accepted by the Engineer. The Engineer may permit measurement of field dry density by a nuclear moisture/density gauge used in accordance with agreed procedure and the gauge is calibrated to provide results identical to that obtained from tests in accordance with IS: 2720 (Part 28). A record of the same shall be maintained by the Contractor.

When density measurements reveal any soft areas in the embankments / subgrade / earthen shoulders, further compaction shall be carried out as directed by the Engineer. If inspired that the specified compaction is not achieved, the material in the soft areas shall be removed and replaced by approved material, compacted using appropriate mechanical means such as light weight vibratory roller, double drum walk behind roller, vibratory plate compactor, trench compactor or vibratory tamper to the density requirements and satisfaction of the Engineer.

#### **305.3.7 Drainage**

The surface of the embankment/subgrade at all times during construction shall be maintained at such a cross fall (not flatter than that required for effective drainage of an earthen surface) as will shed water and prevent ponding.

#### **305.3.8 Repairing of damages caused by rain/spillage of water:**

The soil in the affected portion shall be removed in such areas as directed by the Engineer before next layer is laid and refilled in layers and compacted using appropriate mechanical means such as small vibratory roller, plate compactor or power rammer to achieve the required density in accordance with Clause 305.3.6. If the cut is not sufficiently wide for use of required mechanical

means for compaction, the same shall be widened suitably to permit their use for proper compaction. Tests shall be carried out as directed by the Engineer to ascertain the density requirements of the repaired area. The work of repairing the damages including widening of the cut, if any, shall be carried out by the Contractor at his own cost, including the arranging of machinery/equipment for the purpose.

#### **305.3.9 Finishing operations:**

Finishing operations shall include the work of shaping and dressing the shoulders/verge/ roadbed and side slopes to conform to the alignment, levels, cross sections and dimensions shown on the drawings or as directed by the Engineer subject to the surface tolerance described in Clause 902. Both the upper and lower ends of the side slopes shall be rounded off to improve appearance and to merge the embankment with the adjacent terrain.

The topsoil, removed and conserved earlier (Clause 301.3.2 and 305.3.3) shall be spread over the fill slopes as per directions of the Engineer to facilitate the growth of vegetation. Slopes shall be roughened and moisture slightly prior to the application of the topsoil in order to provide satisfactory bond. The depth of the top soil shall be sufficient to sustain plant growth, the usual thickness being from 75 mm to 150 mm.

Where directed, the slopes shall be turfed with sods in accordance with Clause 307. If seeding and mulching of slopes is prescribed, this shall be done to the requirement of Clause 308.

When earthwork operations have been substantially completed, the road area shall be cleared of all debris, and ugly scars in the construction area responsible for objectionable appearance eliminated.

#### **305.4 Construction of Embankment and subgrade under special conditions.**

##### **305.4.1 Earthwork for widening existing road embankment:**

When an existing embankment and/or subgrade is to be widened and its slopes are steeper than 1 vertical on 4 horizontal, continuous horizontal benches, each at least 300 mm wide, shall be cut into the old slope for ensuring adequate bond with the fresh embankment/subgrade material to be added. The material obtained from cutting of benches could be utilized in the widening of the embankment/subgrade. However, when the existing slope against which the fresh material is to be placed is flatter than 1 vertical on 4 horizontals, the slope surface may only be ploughed or scarified instead of resorting to benching.

Where the width of the widened portions is insufficient to permit the use of conventional rollers, compaction shall be carried out with the help of small vibratory rollers/plate compactors/power rammers or any other appropriate equipment approved by the Engineer. End dumping of material from trucks for widening operations shall be avoided except in difficult circumstances when



the extra width is too narrow to permit the movement of any other types of hauling equipment.

#### **305.4.2 Earthwork for embankment and subgrade to be placed against sloping ground**

Where an embankment /subgrade is to be placed against sloping ground, the latter shall be appropriately benched or ploughed/scarified as required in Clause 305.4.1 before placing the embankment/subgrade material. Extra earthwork involved in benching or due to ploughing/scarifying etc. shall be considered incidental to the work.

For wet conditions, benches with slightly inward fall and subsoil drains at the lowest point shall be provided as per the drawings, before the fill is placed against sloping ground.

Where the contract requires construction of transverse subsurface drain at the cut-fill interface, work on the same shall be carried out to Clause 309 in proper sequence with the embankment and subgrade work as approved by the Engineer.

#### **305.4.3 Earthwork over existing road surface: -**

Where the embankment is to be placed over an existing road surface, the work shall be carried out as indicated below: -

(i) If the existing road surface is of granular or bituminous type and lies within 1 m of the new formation levels, it shall be scarified to a depth of 50mm or as directed so as to provide ample bond between the old and new material ensuring that at least 500 mm portion below the top of new subgrade level is compacted to the desired density.

(ii) If the existing road surface is of bituminous type or cement concrete type and lies within 1 m of the new formation level, the bituminous or cement concrete layer shall be removed completely.

(iii) If the level difference between the existing road surface and the new formation level is more than 1 m. the existing surface shall be roughened after ensuring that the minimum thickness of 500mm of subgrade is available.

#### **305.4.4 Embankment and subgrade around structures: -**

To avoid interference with the construction of abutments, wing walls or return walls of culvert/bridge structures, the Contractor shall, at points to be determined by the Engineer suspend work on embankment forming approaches to such structures, until such time as the construction of the latter is sufficiently advanced to permit the completion of approaches without the risk of damage to the structure.

Unless directed otherwise, the filling around culverts, bridges and other structures upto a distance of twice the height of the road from the back of the abutment shall be carried out independent of the work on the main embankment. The fill material shall not be placed against any abutment or wing wall, unless permission has been given by the Engineer but in any case not until the concrete or masonry has been in position for 14 days. The embankment and subgrade shall be brought up simultaneously in equal layers on each side of the structure to avoid displacement and unequal pressure. The sequence of work in this regard shall be got approved from the Engineer.

The material used for backfill shall not be an organic soil or highly plastic clay having plasticity index and liquid limit more than 20 and 40 respectively when tested according to IS: 2720 (Part 5). Filling behind abutments and wing walls for all structures shall conform to the general guidelines given in IRC: 78. The fill material shall be deposited in horizontal layers in loose thickness and compacted thoroughly to the requirements of Table 300-2.

Where the provision of any filter medium is specified behind the abutment, the same shall be laid in layers simultaneously with the laying of fill material. The material used for filter shall conform to the requirements for filter medium spelt out in Clause 2504 unless otherwise specified in the Contract.

Where it may be impracticable to use conventional rollers, the compaction shall be carried out by appropriate mechanical means such as small vibratory roller, plate compactor or power rammer. Care shall be taken to see that the compaction equipment does not hit or come too close to any structural member so as to cause any damage to them or excessive pressure against the structure.

305.4.5 Construction of embankment over ground incapable of supporting construction equipment.

Where embankment is to be constructed across ground which will not support the weight of repeated heavy loads of construction equipment, the first layer of the fill may be constructed by placing successive loads of material in a uniformly distributed layer of a minimum thickness required to support the construction equipment as permitted by the Engineer. The Contractor, if so desired by him, may also use suitable geosynthetic

material to increase the bearing capacity of the foundation. This exception to normal procedure will not be permitted where, in the opinion of the Engineer, the embankments could be constructed in the approved manner over such ground by the use of lighter or modified equipment after proper ditching and drainage have been provided. Where this exception is permitted, the selection of the material and the construction procedure to obtain an acceptable layer shall be the responsibility of the Contractor. The cost of providing suitable traffic conditions for construction equipment over any area of the Contract, will be the responsibility of the Contractor and no extra payment will be made to him. The remainder of the embankment shall be constructed as specified in Clause 305.3.

305.4.6 Embankment construction under water- and Water-logged areas

305.4.6.1 Embankment construction under water

Where filling or backfilling is to be placed under water, only acceptable granular material or rock shall be used unless otherwise approved by the Engineer. Acceptable granular material shall be of GW, SW, GP, SP as per IS:1498 and consist of graded, hard durable particles with maximum particle size not exceeding 75mm. The material should be non-plastic having uniformity coefficient of not less than 10. The material placed in open water shall be deposited by end tipping without compaction.

305.4.6.2 Embankment construction in waterlogged and Marshy Areas:

The work shall be done as per IRC:34.

#### **305.4.7 Earthwork for high embankment: -**

The material for high embankment construction shall conform to Clause 302.2.1.7. In the case of high embankments (more than 6 m), the Contractor shall normally use fly ash in conformity with Clause 305.2.1.1 or the material from the approved borrow area.

Where provided, stage construction of embankment and controlled rates of filling shall be carried out in accordance with the Contract including installation of instruments and its monitoring.

Where required, the contractor shall surcharge embankments or other areas of fill with approved material for the periods specified in the Contract. If settlement of surcharged fill results in any surcharging fill results the Contractor shall bring the resultant level up to formation level with acceptable materials for use in fill.

#### **305.4.8 Settlement period**

Where settlement period is specified in the Contract, the embankment shall remain in place for the required settlement period before excavating for abutment, wing wall, retaining wall, footings, etc. or driving foundation piles. The duration of the required settlement period at each location shall be as provided for in the contract or as directed by the Engineer.

305.5 Plying of Traffic

Construction and other vehicular traffic shall not use the prepared surface of the embankment and/or subgrade without the prior permission of the Engineer. Any damage arising out of such use shall, however be made good by the Contractor at his own expense as directed by the Engineer.

#### **305.6 Surface Finish and Quality Control of Work**

The surface finish of construction of subgrade shall conform to the requirements of Clause 902. Control on the quality of materials and works shall be exercised in accordance with Clause 903.

#### **305.7 Subgrade Strength**

It shall be ensured prior to actual execution that the borrow area material to be used in the subgrade satisfies the requirements of design CBR.

Subgrade shall be compacted and finished to the design strength consistent with other physical requirements. The actual laboratory CBR values of constructed subgrade shall be determined on remoulded samples, compacted to the field density at the field moisture content and tested for soaked / unsoaked condition as specified in the contract.

#### **305.8 Measurements for Payment**

**305.8.1** Earth embankment/subgrade construction shall be measured separately by taking cross sections at intervals given in Sub-section 113.3 after completion of clearing and grubbing and after completion of embankment / sub-grade. The volume of earthwork in cubic metres by the method of average end areas.

**305.8.2** The measurement of fill material from borrow areas shall be the difference between the net quantities of compacted fill and the net quantities of suitable material brought from roadway and drainage excavation. For this purpose, it shall be assumed that one cum. of suitable material brought to site from road and drainage excavation forms one cu.m. of compacted fill and all bulking or shrinkage shall be ignored.

**305.8.3** The embankment constructed with fly ash will be measured in cum, separately for the fly ash portions and for the soil cover and intervening layers of soil, unless otherwise specified in the contract.

**305.8.4** Construction of embankment under water shall be measured in cu.m.

**305.8.5** Construction of high embankment with specified material and in specified manner shall be measured in cu.m.

**305.8.6** Stripping including storing and reapplication of topsoil shall be measured in cu.m.

**305.8.7** Work involving loosening and recompacting of ground supporting embankment / subgrade shall be measured in cu.m.

**305.8.8** Removal of unsuitable material at embankment/subgrade foundation and replacement with suitable material shall be measured in Cu.m.

**305.8.9** Scarifying existing granular/bituminous road surface shall be measured in square metres.

**305.8.10** Dismantling and removal of existing cement concrete pavement shall be measured vide Clause 202.6.

**305.8.11** Filter medium and backfill material behind abutments, wing walls and other retaining structures shall be measured as finished work in position in cu.m.

**305.9 RATES:**

The Contract unit rates for the items of embankment and subgrade construction shall be payment in full for carrying out the required operations including full compensation for:

(i) Cost of arrangement of land as a source of supply of material of required quantity for construction unless provided other wise in the contract.

(ii) Setting out;

(iii) Compacting ground supporting embankment/subgrade except where removal and replacement of unsuitable material or loosening and recompacting is involved;

(iv) Scarifying or cutting continuous horizontal benches 300mm wide on side slopes of existing embankment and subgrade as applicable;

(v) Cost of watering or drying of material in borrow areas and/or embankment and subgrade during construction as required;

(vi) Spreading in layers, bringing to appropriate moisture content and compacting to specification requirements;

(vii) Shaping and dressing top and slopes of the embankment and subgrade including rounding of corners;

(viii) Restricted working at sites of structures;

(ix) Working on narrow width of embankment and subgrade,

(x) Excavation in all soils from borrow pits/designated borrow areas including clearing and grubbing and transporting the material to embankment and subgrade site with all lifts and leads unless otherwise provided for in the contractor.

(xi) All labour, material, tools, equipment and incidentals necessary to complete the work to the Specifications;

(xii) Dewatering, and

(xiii) Keeping the embankment/completed formation free of water as per Clause 311.

(xiv) Transporting unsuitable excavated material for disposal with all leads and lifts.

**305.9.2** Clause 301.9.5 shall apply as regards Contract unit rates for items of stripping and storing top soil and of reapplication of topsoil.

**305.9.3.** Clause 301.9.2 shall apply as regards Contract unit rate for the item of loosening and recompacting the embankment / subgrade foundation.

**305.9.4.** Clauses 309.1.1 and 305.8 shall apply as regards Contract rates for items of removal of unsuitable material and replacement with suitable material respectively.

**305.9.5.** The Contract unit rate for scarifying existing granular/bituminous road surface shall be payment in full for carrying out the required operations including full compensation for all labour, materials, tools, equipment and incidentals, necessary to complete the work. This will also comprise of handling, giving credit towards salvage value and disposal of the dismantled materials with all leads and lifts or as otherwise specified.

**305.9.6.** Clause 202.7 shall apply as regards Contract unit rate for dismantling and removal of existing cement concrete pavement.

**305.9.7.** The Contract unit rate for providing and laying filter material behind abutments shall be payment in full for carrying out the required operations including all materials, labour, tools, equipment and incidentals to complete the work to Specifications.

**305.9.8.** The Contract unit rate for providing and compacting backfill material behind abutments and retaining walls shall be payment in full for carrying out the required operations including all materials, labour, tools, equipment and incidentals to complete the work to Specifications.

**305.9.9.** Clause 305.4.6 shall apply as regards Contract unit rate for construction of embankment under water.

**305.9.10.** Clause 305.4.7 shall apply as regards Contract unit rate for construction of high embankment. It shall include cost of instrumentation, its monitoring and settlement period, where specified in the Contract or directed by the Engineer.

In case the Contract unit rate specified is not inclusive of all leads, the unit rate for transporting material beyond the initial lead, as specified in the contract for construction of embankment and subgrade shall be inclusive of full compensation for all labour, equipment, tools and incidentals necessary on account of the additional haul or transportation involved beyond the specified initial lead.

**Measurement shall be taken and paid in Cu.m.**

## **Item No. 12 : Demolition of Brick work and stone masonry including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift.(ii) In Cement Mortar.**

**1.1.** The relevant specifications of item No. 20.1.(i) shall be followed except that demolition of brick or stone masonry in lime mortar is to be done.

### **2.0. Mode of measurements and payment**

**2.1.** The relevant specifications of item No. 20.1(i) shall be followed except that the wall and independent piers or columns of brick or stone masonry shall be measured in cubic meters. All copings, corbels, combs and other projections shall be included with the wall measurements.

**2.2.** In measuring thickness of plastered walls, the thickness of plaster shall be included. The unserviceable materials shall be disposed off with all lead and lift. Ashlars face stones dressed stone etc., if required to be taken

down intact shall be dismantled and measured separately in cubic meters.

**2.3.** The rate is exclusive of cleaning of bricks or stones. Honey comb works or hollow block walling shall be measured as solid.

**2.4.** The rate shall be for a unit of one cubic meter.

## **Item No. 13 : Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift. (i) R.C.C. work**

### **1.0. Workmanship**

**1.1.** The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work

including all relevant items as specified or shown in the drawings.

**1.2.** The demolition shall always be planned before hand shall be done in reverse order to the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work.

This however will not absolve the contractor from the responsibility of proper and safe demolition.

**1.3.** Necessary propping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in

such a way that no damage is caused to the adjoining property.

**1.4.** Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be

taken to keep the dust nuisance down as and where necessary.

**1.5.** Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles

shall be properly stacked as directed.

**1.6.** All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.

**1.7.** Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed with all lead and lift. All unserviceable materials, rubbish etc., shall be stacked as directed by the

Engineer-in-charge.

**1.8.** On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed.

## **2.0. Mode of measurements and payment**

**2.1.** Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item.

Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work,

**2.2.** All work shall be measured in decimal system as fixed in its place subject to the following limits; unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Area shall be worked out

to the nearest 0.01 sq. mt.(c) Cubical contents shall be worked out to the nearest 0.01 Cu.m.

**2.3.** The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly

and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the

safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or

portions where considered necessary.

**2.4.** The rate shall be for a unit of one cubic meter.

## **Item No. 14 : Applying two coats of two component dampproof coating of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth as per instruction of Engineer In Charge.**

**1. Manufacturer's Specifications:** Start by exploring products from reputable manufacturers that specialize in crystalline waterproofing.

**2. Certification Check:** Look for products that have certifications from recognized bodies or organizations such as ICC-ES, Ecolabel programs, or the FDA.

**3. Technical Data:** Ensure the product's technical data sheets provide information on crystalline waterproofing, SEM photographs, testing reports, and compliance with relevant standards (IS, ASTM, etc.).

### **Evaluation Criteria:**

**1. Compliance:** Verify if the product meets the standards you've listed (IS 2645, IS 516, ASTM C 1202-05, FDA standards, etc.).

**2. Testing Reports:** Request testing reports from manufacturers for SEM photographs, permeability tests, chloride penetration reduction, and chemical erosion resistance.

**1. Certifications:** Check if the product is listed in ICC-ES EVALUATION REPORT INDEX and holds green certifications from recognized Ecolabel programs.

**2. Application Method:** Ensure the product's application aligns with the approved method of waterproofing accepted by the Engineer in Charge.

### **Procurement Process:**

**1. Tender Process:** During the tender process, request comprehensive documentation from potential suppliers, including test reports, certifications, and compliance details.

**2. Review and Approval:** Evaluate the documentation provided by suppliers thoroughly, seeking clarification or additional information as needed.

**3. Contractual Agreement:** Once you've selected a product and supplier, establish a contractual agreement outlining the scope of work, compliance standards, and warranties.

**4.** The rate shall be for a unit of one sq. meter.

**Item No. 15 : Applying general insecticide pest control treatment to floors, cupboards etc including labour materials etc. complete. Using Imidacloprid 30.5 SCas Per IS 6313 part -II( 0.075% concentration by mass) is recommended 10.5ml chemical diluted with 5 liters of water application 0.5 litre chemical /Sqm of surface is recommended as per I.S.**

**1 Materials :**

The chemicals used for the soil treatment shall be only one of the following with concentration shown against each in aqueous emulsion.

Chemicals Concentration

1. Aldrin 0.50% (by weight)

2. Heptachlor 0.50% (by weight)

3. Chlordane 1.00% (by weight)

2.1. The chemicals barrier shall be complete and continuous under whole of the structure to be protected.

2.2. The bottom and the sides of foundations up to a height of 30 cms. from the bottom of excavation made for masonry foundation and for basement column pits shall be treated with the chemical emulsion at the rate 5 liters/ sq. meter of the surface area.

2.3. The chemical treatment shall be-carried out when the surfaces is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil wet with rain or sub soil water.

2.4. Once formed, treated soil barriers shall be not disturbed. If by chance, treated soil barriers are disturbed, immediate steps shall be taken to restore the continuing and compactness of the barrier system

2.5. The treatment against termite infection shall remain fully effective for a period not less than 10 years from date of issue of the final certificate to completion of work. If at any time during this period, any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed, the contractor shall be rectify the concerned defects within 14 days on receipt of notice from Engineer-in-charge. On contractor's failure to do so, the Engineer-in-charge may get the same rectified through any other agency at contractor's risk and cost, and decision of Engineer-in-charge as to the cost payable by contractor for the same shall be final and binding to the contractor.

2.6. A guarantee bond on appropriately stamped paper shall be given by the contractor to the department in the manner and form prescribed below:

**FORM OF GUARANTEE BOND**

I/We..... ( Contractor) hereby guarantee that work will remain unaffected and will not be any way damaged by termite or any other germs of similar types, for a period for 10 years after completion of the work of anti-termite as per the terms and conditions of the contract and or damage that might be caused on account of termite and or other similar type of germs and hereby Guarantees to make good any loss of damages suffered by the Government of Gujarat and further guarantee to redo effective work without claiming any extra cost.

2.7. This guarantee shall remain in force for the period of 10 years from the completion of the work under the

contract and it shall remain binding to the contractor for period of 10 years.

2.8. The deposit at the rate of 50% of the cost of this item from the running and final bills shall be recovered and retained for the first one year after completion of the work and 10% shall be retained for the balance of guarantee period and shall be refunded only after the completion of the guarantee period.

**3.0. Mode of measurements & payment**

3.1. The length and breadth shall be measured correct to a cm. as per the dimensions of sanctioned plans. No deduction shall be made nor extra paid for any opening for pipes etc. up to 0.1.sq. mt. The rate shall include the cost of all labour and materials required for the operation involved for satisfactory completion of this item. The sides of the trenches 30 cms, each side and bottom shall be measured under this item.

3.2. The rate shall be for a unit of One sq. meter.

**Item No. 16 : Removing dry or oil bound distemper by a washing and scraping and sand papering the wall surface smooth including necessary repairs to scratches complete.**

The work shall be executed as per the specification of "Item No. 18.33. Page No. 129 "of attached Building Specification Booklet.

The rate shall be for a unit of one sq. meter.

**Item No. 17 : Applying two coats of lappy (putty) and two coats of approved brand and manufacture on new wall surface to give as even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand paper smooth.**

The work shall be executed as per the specification of "Item No. 18.57. Page No. 136 "of attached Building Specification Booklet.

The rate shall be for a unit of one sq. meter.

**Item No. 18 : Distempering (Three coats) with oil bound washable distemper of approved brand and manufacture and of required shade on wall surfaces to give and even shade over and including a primer coat with alkali resistance primer of approved brand after thoroughly brushing the surface to give an even shade free from mortar droppings and other foreign matter and also including preparing the surface even and smooth for all floor etc. complete.**

**1.0. Materials**

1.1. Oil bound washable distemper and primer shall be of approved brand and manufacture. The distemper shall be of required colour and shade and the same shall conform to I.S. : 428-1969.

**2.0. Workmanship**

**2.1. Scaffolding**

Where scaffolding is required, it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be distempered. A properly secured and well tied suspended platform (Joola) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent

scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary.

**2.2. Preparation of surface :**

2.2.1. The undecorated surface to be distempered shall be thoroughly brushed from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for at least

2 months before applications of distemper.

2.2.2. All unnecessary nails shall be removed. Pitting in plaster shall be made good with plaster again with a fine grade sand paper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is allowed. The surface affected by moulds, moss, fungi, algae lichens, efflorescence etc. shall be treated in accordance with I.S; 2395 (Part 01) 1966. Before applying

distempering, any unevenness shall be made good by applying putty made of plaster of paris mixed with water on

entire surface including filling up the undulation and then sand papering the same after it is dry.

**2.3. Priming coat :**

2.3.1. A priming coat of distemper primer of approved manufacture and shade shall be applied over the papered surface in case of new work on undecorated surface. If the distemper priming is done after the wall surface

dries completely, the distemper primer shall be applied.

2.3.2. Application of primer shall be done as under: The primer shall be applied with a brush on the clean dry and

smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards.

This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush

marks. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied.

2.3.3. Oil bound distemper is not recommended to be applied within six months of the completion of wall plaster.



#### **2.4. Preparation of oil bound distemper :**

**2.4.1.** The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer only. Sufficient quantity of distemper required for a days work shall be prepared.

#### **2.5. Application of Distemper coat:**

**2.5.1.** For undecorated surfaces, after the primer coat is dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out priming coat. All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of at least 24 hours between consecutive coats to permit proper drying of the proceeding coat. The finished surface shall be even and uniform without patches, brush marks, distemper drops etc.

**2.5.2.** Sufficient quantity of distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot be completed on the same day.

**2.5.3.** 15 cm. double bristled distemper brush shall be used. After day's work brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

**2.6.** Protective measurements : The surfaces of doors, windows, floors, articles of furniture etc. and such other parts of the buildings as are not to be distempered shall be protected from being splashed upon. Such surfaces shall be cleaned of distemper splashes if any.

#### **3.0. Mode of measurements and payment**

**3.1.** Priming coat of distemper primer, scraping of surface spoiled by struck roots, removal of oil and grease spots, treatment for infestation of efflorescences, mould moss, fungi, algae and lichen and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

**3.2.** All the work shall be measured net in the decimal system as in place subject to the following limits unless otherwise stated hereinafter:

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 sq. m. All work shall be made for ends of joints, beams, posts etc., and openings, not exceeding 0.5 sq.m. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings not for finish around ends of joints, beams, posts etc.

**3.3.** Deductions of opening exceeding 0.5 sq.m. but not exceeding 3 sq. m. each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings :

(a) When both the faces of wall are provided with same finish, deductions shall be made for one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveals is less than that of the other side but no deduction shall be made on

the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more

than that on untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.

**3.4.** In case of opening of area exceeding 3 sq. m. each deduction shall be made for openings but jambs, sills and soffits shall be measured.

**3.5.** No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.

**3.6.** Item includes removing nails, making good holes, patches with materials similar in composition of distemper.

**3.7.** The rate includes cost of all materials, labours, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handling, unloading, storing work etc

#### **2.8. The rate shall be for a unit of one sq. meter**

### **Item No. 19 : Dismantling sanitary fittings like wash basin . W.C. pan Indian and European type, flushing tank etc. including stacking the materials with all lead and lift.**

The work shall be executed as per the specification of "Item No. 20.00.I. Page No. 151" of attached Building Specification Booklet.

#### **2.0. Mode of measurements & payment**

**2.1.** The relevant specifications of item No. 20.1 (i) shall be followed.

**2.2.** The rate shall be for a unit of one number..



**Item No. 20 : Providing and fixing Flush tank of approved quality with all necessary connections with inlet, outlet and overflow etc. including all labour and materials as directed by engineer in charge.**

### **Specification Explained: Flush Tank Installation**

#### **Scope of Work:**

Providing and fixing a flush tank (toilet cistern) of approved quality, complete in all respects.

#### **What is Included:**

##### **1. Supply of Flush Tank**

- A flush tank of **approved make and quality** (as per project specifications or engineer's approval).

##### **2. Fixing / Installation**

- Proper mounting and positioning of the flush tank (wall-mounted or concealed, depending on design).

##### **3. Connections**

- **Inlet connection:** Connecting water supply line to the tank with necessary fittings (valves, pipes, etc.).
- **Outlet connection:** Connecting the flush tank to the WC (toilet pan) for proper flushing.
- **Overflow arrangement:** Ensuring overflow pipe is installed to prevent water spillage.

##### **4. Accessories & Fittings**

- All required internal and external components such as:
  - Float valve / ball cock
  - Flush valve mechanism
  - Pipes, bends, connectors
  - Clamps, screws, brackets, etc.

##### **5. Labour**

- Skilled and unskilled labour required for installation, fitting, testing, and commissioning.

##### **6. Materials**

- All necessary materials required for a complete working system (unless specified otherwise).

##### **7. Testing & Completion**

- Checking for proper functioning:
  - No leakage
  - Smooth flushing operation
  - Proper water filling and cutoff

##### **8. As Directed by Engineer-in-Charge**

- Work must follow instructions, quality standards, and approvals from the supervising engineer.

#### **Mode of measurements & payment**

The rate shall be for a unit of Each

**Item No. 21 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Quarter Turn Pillar Cock for Basin including labour, material, transportation etc. complete as directed by engineer incharge.**

The work shall be executed as per the specification of "Item No. 23.8, Page No. 173" of Building Specification Booklet.

Payment shall be made on Nos. basis.

**Item No. 22 : Providing and fixing post and pipe railing as per detailed drawing including 3 coats of painting to steel works complete.**

Specification Explained: Post and Pipe Railing

**Scope of Work:**

Providing and fixing post and pipe railing as per detailed drawings, including painting and finishing, complete in all respects.

**What is Included:**

**1. Supply of Materials**

- Steel posts and pipes of required diameter, thickness, and grade as shown in drawings.
- Base plates, cleats, brackets, and other necessary steel components.

**2. Fabrication Work**

- Cutting, bending, welding, and shaping of posts and pipes as per design.
- Preparing railing panels, including horizontal/vertical members as specified.

**3. Fixing / Installation**

- Erecting posts at correct spacing and alignment.
- Fixing railing securely to:
  - Floor, slab, staircase, balcony, or ground surface.
- Embedding or anchoring using:
  - Foundation bolts, grouting, or welding (as per drawing).

**4. Surface Preparation**

- Cleaning steel surface by:
  - Removing rust, oil, grease, and scale.
- Applying primer coat before painting.

**5. Painting**

- Applying **3 coats of paint** to all exposed steel surfaces:
  - Typically includes:
    - 1 coat of primer
    - 2 coats of enamel/approved paint
- Ensuring uniform finish and protection against corrosion.

**6. Labour and Equipment**

- All skilled labour, tools, machinery, scaffolding, and handling required for fabrication and erection.

**7. Alignment & Finishing**

- Ensuring:
  - Proper line, level, and verticality
  - Smooth joints and neat welding
  - Clean and finished appearance

**8. Completion**

- Making the railing fully functional, safe, and aesthetically acceptable.

**9. As Per Detailed Drawing & Engineer's Instructions**

- All work must strictly follow approved drawings and directions of the Engineer-in-Charge.

**Mode of Payment:**

The Payment shall be made on RMT basis of finished work done.

**item No. 23 :** Providing laying and jointing in true line and level 40mm dia. U.P.V.C. Pipe ( SCH- 40) for cold water including fittings as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.

The work shall be executed as per the specification of "**Item No. 23.8 Page No. 162 (40 mm dia. Shall be used)**" of Building Specification Booklet.

Payment shall be made on **Rmt** basis.

**Item No. 24 :** Providing and fixing to wall ceiling and floor 10.0 Kg. F/Cm<sup>2</sup> working pressure poluthene pipes of the following outside Dia. Low density, complete with special falnge compression type fittings, wall clipsetc. including making good the wall ceiling and floor.(G)110 mm

The work shall be executed as per the specification of "**Item No. 23.8, Page No. 173**" of Building Specification Booklet.

Payment shall be made on **Rmt** basis.

**Item No. 25 :** Providing and fixing standared extruded of alluminium section of size 63.50 x 38.10 x 1.95 mm @ Wt 1.094 Kg/Rmt. with colour Powder Coated alluminium frame with 5 mm thick bakelite sheet shutter with steel hinge, handles and necessary fixtures and fastenings etc. complete for Door.

Specification Explained: Aluminium Door with Bakelite Sheet Shutter

### **Scope of Work:**

Providing and fixing a door made from standard extruded aluminium sections with bakelite sheet shutter, including all fittings and finishes, complete in all respects.

What is Included:

#### *1. Aluminium Frame*

- Using **standard extruded aluminium section** of size:  
**63.50 mm × 38.10 mm × 1.95 mm thickness**
- Weight: **1.094 kg per running meter (Rmt)**
- Sections to be:
  - Cut, assembled, and fixed as per door design and size.

#### *2. Powder Coating Finish*

- Aluminium frame to be **colour powder coated**:
  - Provides smooth finish
  - Improves durability and corrosion resistance
- Colour as approved by Engineer-in-Charge.

#### *3. Door Shutter*

- Shutter made using:
  - **5 mm thick bakelite sheet**
- Properly fixed within aluminium frame using suitable beading or fastening system.

#### *4. Hardware & Fittings*

- Providing and fixing:
  - **Steel hinges** (for smooth opening/closing)
  - **Handles**
  - Required fixtures such as:
    - Screws
    - Fasteners
    - Stoppers (if specified)

#### *5. Fabrication Work*

- Cutting, drilling, and assembling aluminium sections.
- Making door frame and shutter in proper shape and size.
- Ensuring tight joints and proper alignment.

#### *6. Fixing / Installation*

- Installing the door in position:
  - Proper alignment (vertical and horizontal)
  - Firm anchoring to wall/opening using screws, plugs, or holdfasts.

#### *7. Finishing & Adjustments*

- Ensuring:
  - Smooth operation of shutter
  - Proper closing and locking alignment
  - No gaps or misalignment

#### *8. Labour and Materials*

- Includes all:
  - Skilled labour
  - Tools and equipment
  - Materials required for complete installation

#### *9. Completion*

- Door to be delivered:
  - Fully functional
  - Neatly finished
  - Ready for use

#### *10. As Per Direction*

- Work executed as per:
  - Approved drawings
  - Instructions of Engineer-in-Charge

**Payment shall be made on Sqm basis.**

**Item No. 26 : Repairing to Door / Window including dissembling from frame, wroughting, providing patti, angles, replacing / repairing stoppers - aldrops - handles etc. for proper fixing in to frame hole etc. complete for smooth operation and proper utilization including assambeling and refixing of the same as directed by Engineer-in-charge.**

### **1. Scope of Work**

This specification covers the **repair, disassembly, reassembly, and painting of wooden doors/windows**, including replacement of defective parts and ensuring smooth operation.

### **2. Work Details**

#### **A. Disassembly & Inspection**

1. Carefully **dismantle the door/window from the frame** without causing damage.
2. Inspect for **damaged, worn-out, or misaligned components** such as hinges, handles, stoppers, AL drops, etc.
3. Identify any **woodwork issues** such as cracks, warping, or termite damage.

#### **B. Repair & Replacement**

4. **Roughing (reshaping/smoothing) the wooden surface** where necessary.
5. **Providing & fixing Patti, angles, or reinforcements** to strengthen the structure.
6. **Replacing or repairing defective hardware** such as: ○ **Hinges, handles, stoppers, AL drops, latches, locks.**  
○ Adjusting for proper alignment and smooth movement.
7. **Ensuring a proper fit** into the frame hole for smooth operation.

#### **C. Reassembly & Fixing**

8. **Assemble and refax the door/window back into the frame.**
9. Check for **proper alignment and ease of operation** (opening/closing smoothly).

#### **D. Painting & Finishing**

10. **Cleaning the surface** thoroughly, removing dust, dirt, and old flakes.
11. **Applying one coat of enamel paint** over the previously painted surface: ○ Ensuring **an even shade** without streaks.  
○ **Excluding primer coat** (if already primed).
12. **Final inspection** to ensure smooth operation and aesthetic finish.

### **3. Materials & Tools Required**

- **Patti, angles, screws, nails, adhesives** for reinforcements.
- **Hardware fittings:** Hinges, handles, stoppers, AL drops, locks.
- **Enamel paint (approved brand & shade)** for uniform finish.
- **Sandpaper, wire brush, putty** for surface preparation.
- **Paintbrushes/rollers** for smooth application.

### **4. Measurement & Payment**

Payment shall be made on **Sqm** basis.

**Item No. 27 : Providing and fixing screw down bib taps of following size. (B) Brass chromium plated screws down Bib Tap. (ii) 20mm dia.**

The work shall be executed as per the specification of "Item No. 23.92.(A)(II). (A) Page No. 170 " of Building Specification Booklet.

Payment shall be made on **Each basis**.

**Item No. 28 : Providing and fixing Health Faucet Heavy duty with hook with fitting including all labour and materials as directed by engineer in charge.**

**Specification Explained: Health Faucet (Heavy Duty) with Hook**

**Scope of Work:**

Providing and fixing a heavy-duty health faucet (hand shower) with hook, including all necessary fittings, labour, and materials, complete in all respects.

**What is Included:**

**1. Supply of Health Faucet**

- Providing a **heavy-duty health faucet** of approved make and quality.
- Typically includes:
  - Hand spray (trigger-operated)
  - Flexible hose (usually stainless steel or reinforced)

**2. Hook / Holder**

- Supplying and fixing a **wall-mounted hook/holder**:
  - To properly hang and support the health faucet after use.

**3. Fittings & Accessories**

- All necessary components such as:
  - Connection pipe / hose
  - Angle valve or stop cock (if specified)
  - Nipples, connectors, washers, Teflon tape, etc.

**4. Installation / Fixing**

- Fixing the health faucet near WC at suitable height and position.
- Connecting to water supply line securely.
- Ensuring proper fixing of hook on wall.

**5. Testing**

- Checking for:
  - Smooth water flow
  - Proper trigger operation
  - No leakage at joints or connections

**6. Labour and Materials**

- Includes all:
  - Skilled labour
  - Tools and equipment
  - Consumables required for complete installation

**7. Finishing**

- Neat and proper installation with:
  - Correct alignment
  - Clean appearance

## 8. Completion

- Health faucet system to be:
  - Fully functional
  - Ready for use

## 9. As Directed by Engineer-in-Charge

- Work to be executed as per:
  - Instructions
  - Approved quality standards

The rate shall be for a unit of one. number.

### **Item No. 29 : Providing and fixing M.I. fisher union for washbasin or sink. (B) 40mm dia.**

Specification Explained: M.I. Fischer Union (40 mm dia.) for Washbasin/Sink

#### **Scope of Work:**

Providing and fixing a **Malleable Iron (M.I.) Fischer Union** of 40 mm diameter for washbasin or sink, complete with all fittings, labour, and materials.

What is Included:

#### *1. Supply of M.I. Fischer Union*

- Providing **M.I. (Malleable Iron) Fischer Union**:
  - Size: **40 mm diameter**
  - Used for **easy connection and disconnection** of pipes.
- Must be of **approved make and quality**.

#### *2. Purpose*

- Installed in the waste/soil pipe line of:
  - Washbasin
  - Sink
- Allows:
  - Easy maintenance
  - Quick removal of pipe sections without cutting

#### *3. Fittings & Accessories*

- Includes all necessary components such as:
  - Nuts, sockets, and washers
  - Threading materials (Teflon tape, sealant, etc.)
  - Connectors to existing pipeline

#### *4. Installation / Fixing*

- Fixing the union in the pipeline at appropriate location.
- Proper alignment with inlet and outlet pipes.
- Ensuring tight threaded connections.

### *5. Testing*

- Checking for:
  - Leakage at joints
  - Proper fitting and alignment

### *6. Labour and Materials*

- Includes:
  - Skilled labour
  - Tools and equipment
  - All consumables required for installation

### *7. Finishing*

- Ensuring neat installation and proper positioning for accessibility.

### *8. Completion*

- System to be:
  - Leak-proof
  - Fully functional

### *9. As Directed by Engineer-in-Charge*

- Work carried out as per:
  - Standard plumbing practices
  - Instructions of Engineer-in-Charge
- **Mode of measurements and payment**
- The rate shall be for a unit of one. number.



**Item No. 30 : Providing and fixing M.S. grills of required pattern to wooden frames of windows etc. with M.S. flats at required spacings and frame around, square or round bars with round headed bolts and nuts or by screws. (A) Plain Grill.**

The work shall be executed as per the specification of "**Item No. 10.100.(A) Page No. 75**" of **attached**

**Building Specification Booklet.**

face of the frame strips.

**3.0. Mode of measurements & payment**

**3.1.** No payment shall be made for weight of screws, bolts nuts etc. only weight of grill shall be paid.

**3.2.** The rate shall be for a unit of one **kg**.

**Item No. 31 : Rehabilitation of RCC Structure including removal of cement plaster spallad, loose and disintegrated concrete with Cleaning the surface of the cement concrete and reinforcement from all the loose materials with wire brush, water jetting etc. then Pro. & Fix. Chicken wire mesh of 16x24 guage Mesh to Prevent the damaged part of the existing R.C.C. member through attend ensure proper bonding between old and new concrete application of bonding coat of slurry of POLYALK-EP and cement in 1:2 (1 cement : 2 polyalk EP) after then Providing 20 mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand) including floating coat for finishing with a floating coat of neat cement slurry.**

Specification Explained: Rehabilitation of RCC Structure

**Scope of Work:**

Repair and rehabilitation of damaged **R.C.C. (Reinforced Cement Concrete) members**, including surface preparation, treatment of reinforcement, application of bonding agent, mesh fixing, and plastering.

**Detailed Breakdown of Work**

**1. Removal of Damaged Concrete**

Carefully removing:

Cement plaster

Spalled (damaged/flaked) concrete

Loose and disintegrated portions

Ensuring only **sound concrete** remains.

Done using tools like chipping hammers (manual/mechanical).

**2. Surface Cleaning**

Cleaning exposed surfaces of:

Concrete

Reinforcement (steel bars)

Using methods such as:

Wire brushing

Water jetting

Objective:

Remove rust, dust, laitance, and loose particles

Prepare surface for proper bonding

**3. Fixing Chicken Wire Mesh**

Providing and fixing **chicken wire mesh (16 × 24 gauge)**:

Properly anchored to existing RCC surface

Purpose:

Prevent further cracking

Improve bonding between old and new material

Provide support to repair layer

#### 4. Bonding Coat Application

Applying bonding slurry made of:

**POLYALK-EP + Cement in ratio 1:2**

*(1 part cement : 2 parts Polyalk-EP)*

Applied over prepared surface before plastering.

Purpose:

Ensure **strong adhesion** between old concrete and new plaster

#### 5. Plastering Work

Providing **20 mm thick cement plaster:**

In **single coat**

On repaired RCC surfaces / walls (up to second floor level)

Plaster Mix:

Cement mortar **1:3 (1 cement : 3 sand)**

#### 6. Finishing

Applying:

**Floating coat** for leveling

Final smooth finish using **neat cement slurry**

Ensuring:

Even surface

Smooth and crack-free finish

#### 7. Labour & Materials

Includes:

All materials (cement, sand, mesh, bonding chemical, etc.)

Skilled and unskilled labour

Tools, equipment, scaffolding

#### 8. Completion Requirements

Repaired surface should be:

Structurally sound

Properly bonded

Smooth and aesthetically finished

Free from cracks and delamination

#### 9. As Directed by Engineer-in-Charge

Entire work executed as per:

Standard repair practices

Site conditions

Engineer's instructions

. Mode of Payment:

**The rate shall be for unit of Sqm.**

**Item No. 32 : Providing and fixing Fabric Curtain with Rod & Eyelet with Scratch and Rust free 1" metal (iron) rod with decorative round finials or either end. Powder coated finish in nickel, Bronze or Black shades as section to be supplied & installed in all windows with great precision. Fabric as per selection of Architect, Stitching & fixing as required by design all necessary fixtures & Fasteners including finials, brackets, fishers etc. complete**

Specification Explained: Fabric Curtain with Rod & Eyelet

Scope of Work:

Providing and fixing fabric curtains with rod and eyelet system, including all accessories, fittings, stitching, and installation, complete in all respects.

---

Detailed Breakdown of Work

**1. Curtain Fabric**

Supplying fabric curtain material:

Quality, design, colour, and pattern as selected by the Architect

Fabric should be:

Durable

Suitable for interior use

Properly finished

---

**2. Stitching of Curtains**

Curtains to be stitched as per required design:

Proper hemming on all sides

Eyelet provision at top for hanging

Ensuring:

Neat finish

Correct dimensions as per window size

---

**3. Eyelet System**

Providing eyelets (metal rings) at top of curtain:

Evenly spaced

Rust-resistant

Allows smooth sliding over curtain rod.

---

**4. Curtain Rod**

Supplying and fixing:

1-inch diameter metal (iron) rod

Rust-free and sturdy

Finish:

Powder-coated finish in approved shades:

Nickel

Bronze

Black

---

**5. Finials**

Providing decorative round finials at both ends of rod:

Enhances appearance

Prevents curtain from slipping off

---

**6. Brackets & Supports**

Fixing rod using:

Strong brackets

Proper supports at required spacing

Ensuring:  
Firm fixing to wall  
Proper alignment and level

---

## 7. Fasteners & Accessories

Including all necessary items such as:

Screws

Fischer plugs

Clamps and supports

Ensuring complete and secure installation

### **Mode of Measurement and Payment:**

This shall be measured in one liter basis and rates are as per liter basis for the volumetric capacity of the water tank. Rate shall be inclusive of placing, lifting, storing and making connection for inlet, outlet, overflow pipe, out pipe with all necessary plumbing work and material. For complete work.

**Item No. 33 : Providing and fixing wooden paneling made of framing the skeleton (plywood frame structure) with 18mm + 18mm thick MR grade plywood for vertical and horizontal plywood (patti) one side cover with 6mm thick MR grade plywood for grooving as per design. Fixing properly without any air gap and finishing with selected 1.00 mm thick laminate. Before installation, make hole/face plate for conduit pipes of electrical/networking cables with openable stud from partition. Including all materials and labour etc. complete as per detail drawing and instruction of engineer-in charge. Wooden Pelmat Laminate**

**Specification: Providing & Fixing Wooden Paneling with Laminate Finish (Including Pelmet)**

### **Scope of Work:**

Providing and fixing wooden paneling including pelmet, complete in all respects as per approved drawings and instructions of the Engineer-in-Charge.

#### **1. Framework (Skeleton Structure)**

- The paneling shall be constructed using a **plywood framework (skeleton structure)**.
- Framework to consist of:
  - **18 mm + 18 mm thick MR grade plywood** used for vertical and horizontal members (pattis).
- The framework shall be rigidly fixed to the wall surface with proper alignment, level, and plumb.

#### **2. Base Layer / Grooving Surface**

- One side of the framework shall be covered with:
  - **6 mm thick MR grade plywood.**
- This layer shall be used for **grooving/design pattern** as per approved drawings.

#### **3. Finishing**

- The visible surface shall be finished with:
  - **1.0 mm thick decorative laminate** of approved make, shade, and texture.
- Laminate shall be:
  - Properly bonded using approved adhesive.
  - Finished smoothly without bubbles, wrinkles, or surface undulations.

#### **4. Installation Requirements**

- Paneling shall be fixed:
  - **Firmly without any air gaps** between wall and framework.
  - With proper anchoring using screws, fasteners, and adhesives as required.
- All joints shall be:
  - Neatly finished and aligned.
  - Treated to avoid visible seams.

## 5. Electrical & Networking Provisions

- Prior to installation:
  - Necessary **cut-outs/holes** shall be made for **electrical and networking conduit pipes**.
- Provide:
  - **Openable access panels (stud type)** for maintenance.
  - Proper positioning of **face plates/switch boards** as per drawings.

## 6. Wooden Pelmet

- Wooden pelmet to be provided as part of the paneling work:
  - Made from the same plywood framework system.
  - Finished with **1.0 mm laminate** matching/contrasting as per design.
- Pelmet shall be:
  - Properly aligned and securely fixed.
  - Integrated seamlessly with paneling.

## 7. Materials

- All plywood shall be:
  - **MR (Moisture Resistant) grade**, IS standard compliant.
- Laminate:
  - Approved brand and quality.
- Adhesives, screws, and hardware:
  - Of standard quality as approved.

## 8. Workmanship

- Work shall be executed:
  - As per detailed drawings and site conditions.
  - Under supervision of the Engineer-in-Charge.
- Finished surface shall be:
  - Smooth, level, and aesthetically uniform.

## 9. Measurement & Rate

- The rate shall include:
  - All materials, labour, tools, and tackles.
  - Cutting, fixing, finishing, electrical provisions, and pelmet work.
- Complete **in all respects**.

### Mode of Payment:

The Payment shall be made on Sqm basis of finished work done.

**Item No. 34 : Providing and erecting Approved make Ceiling fan with double ball bearing ISI mark with condenser A.C. 230V.50 c/s.1200 mm. sweep complete, canopy erected on existing hook or clamp with earthing. [Make shall be approved by Engineer in charge]**

Specification Explained: Ceiling Fan (1200 mm Sweep)

**Scope of Work:**

Providing and erecting an approved make ceiling fan with all necessary fittings, electrical connections, and accessories, complete in all respects.

Detailed Breakdown of Work

1. Supply of Ceiling Fan

Providing **ceiling fan of approved make** (as per Engineer-in-Charge).

Specifications:

**Sweep:** 1200 mm

**Type:** A.C. fan

**Voltage:** 230 V

**Frequency:** 50 cycles/second (Hz)

Equipped with **condenser (capacitor type motor)**

2. Quality Standards

Fan must be:

**ISI marked** (ensuring standard quality and safety)

Fitted with **double ball bearings:**

Ensures smooth and noiseless operation

Longer life

3. Components Included

Complete fan set including:

Motor unit

Blades

Downrod

Shackle assembly

Capacitor

Fan regulator (if specified separately or included as per BOQ)

4. Canopy

Providing and fixing **top and bottom canopy:**

To cover mounting and wiring joints

Ensures neat appearance

5. Installation / Erection

Fixing the fan:

On **existing hook or clamp** provided in ceiling

Ensuring:

Proper alignment

Safe and firm fixing

6. Electrical Connections

Connecting fan to power supply:

Proper wiring

Tight and secure connections

Ensuring correct functioning of capacitor and motor

7. Earthing

Providing proper **earthing connection:**

For safety against electric shock

8. Testing

Checking:

Smooth rotation

No noise or wobbling

Proper speed control (if regulator connected)

## 9. Labour and Materials

Includes:

All materials required for installation

Skilled electrician labour

Tools and equipment

## 10. Completion

Fan to be:

Fully operational

Safely installed

Neatly finished

## 11. As Approved

Make/brand must be:

**Approved by Engineer-in-Charge**

Work executed as per standard electrical practices.

Payment shall be made on **E.a.** basis.

## **Item No. 35 : Replacing the bearing/ bushing of Ceiling fan and putting the fan in working order including credit of D.M. retained by Agency. (a) Bearing**

Specification Explained: Replacement of Ceiling Fan Bearing

Scope of Work:

Replacing the bearing of an existing ceiling fan and restoring it to proper working condition, including all labour, materials, and adjustments.

Detailed Breakdown of Work

### 1. Dismantling of Fan

Carefully removing the ceiling fan from its position.

Disconnecting electrical connections safely.

Lowering the fan for repair work.

### 2. Opening the Motor Assembly

Dismantling the fan motor housing.

Accessing internal components, especially the bearing.

### 3. Replacement of Bearing

Removing the worn-out or damaged bearing.

Supplying and fixing a new suitable bearing of proper size and quality.

Ensuring:

Proper fitting

Alignment with shaft

### 4. Cleaning & Servicing

Cleaning internal parts:

Removing dust, grease, and old lubricant

Applying fresh lubrication where required.

### 5. Reassembly

Reassembling motor and fan components.

Ensuring all parts are properly tightened and aligned.

### 6. Refixing the Fan

Mounting the fan back on:

Existing hook or clamp

Reconnecting electrical wiring safely.

## 7. Testing & Commissioning

Checking:

Smooth rotation

No abnormal noise or vibration

Proper speed performance

## 8. Labour & Materials

Includes:

Skilled electrician/mechanic labour

Cost of bearing and consumables

Tools and equipment

## 9. Credit of D.M. (Dismantled Material)

The old (replaced) bearing:

Is retained by the contractor/agency

Its scrap/residual value is adjusted (credited) in the item rate

Payment shall be made on **E.a.** basis.

**Item No. 36 : Providing following type of Modular Type Accessories mounted with PVC / metallic/Wooden box, single mounting base frame covered with textured / metallic/white front plate , modules erected with necessary connections as per site situation directed by Engineer In charge. (5) Electronic hum Free steps EME Fan regulator, Cat.III**

Specification Explained: Modular Type Electronic Fan Regulator (EME, Step Type)

### **Scope of Work:**

Providing and fixing a **modular type electronic, hum-free step fan regulator (EME type, Category III)** with all accessories, fittings, and connections, complete in all respects.

---

#### Detailed Breakdown of Work

##### 1. Supply of Modular Accessories

Providing **modular type fan regulator:**

**Electronic type (EME – Electronic Modular Equipment)**

**Step type regulator** (fixed speed levels)

**Hum-free operation** (no buzzing sound during use)

Category: **Cat. III** (as per specified quality/standard)

---

##### 2. Mounting Arrangement

Regulator to be installed in:

**PVC / Metallic / Wooden box** (as available or specified)

Fitted with:

**Single mounting base frame**

Compatible modular support system

---

##### 3. Cover Plate

Providing **front cover plate:**

Finish options:

Textured

Metallic

White

Ensures:

Aesthetic appearance

Protection of internal components

---

##### 4. Installation / Fixing

Properly fixing regulator module into the base frame.

Mounting inside switch box firmly and in alignment.



---

#### 5. Electrical Connections

Connecting regulator to:

Fan circuit

Phase line and load side

Ensuring:

Proper and सुरक्षित wiring

Tight connections to avoid sparking or heating

---

#### 6. Performance Requirements

Regulator should:

Control fan speed in **steps (levels)**

Operate **smoothly without humming noise**

Be energy-efficient (electronic type)

---

#### 7. Labour and Materials

Includes:

All materials (regulator, plate, frame, screws, etc.)

Skilled electrician labour

Tools and consumables

---

#### 8. Testing

Checking:

Proper speed variation

No humming or heating

Smooth functioning

---

#### 9. Completion

Installed unit should be:

Safe

Neatly finished

Fully operational

---

#### 10. As Directed by Engineer-in-Charge

Work executed as per:

Site conditions

Instructions of Engineer-in-Charge

---

Payment shall be made on **E.a.** basis.

## **Item No. 37 : Replacing condenser for ceiling fan/ Exhaust Fan / Pedestal Fan / Table Fan / Cabin Fan {Credit of D.M. retained by Agency.}**

### **Specification Explained: Replacement of Condenser for Fans**

#### **Scope of Work:**

Replacing the **condenser (capacitor)** of ceiling fans, exhaust fans, pedestal fans, table fans, or cabin fans, including all labour, materials, testing, and adjustments, with **credit for old dismantled material (D.M.)** retained by the agency.

#### **Detailed Breakdown of Work**

##### 1. Dismantling the Fan

- Safely disconnecting and removing the fan from power supply.
- Lowering the fan (ceiling/exhaust type) carefully for repair.

##### 2. Accessing the Condenser

- Opening the motor housing of the fan.
- Identifying and removing the faulty or damaged capacitor/condenser.

##### 3. Supply of Condenser

- Providing a **new condenser/capacitor** of appropriate:
  - **Capacitance ( $\mu\text{F}$ )**
  - **Voltage rating (V)**
  - Quality and brand approved by Engineer-in-Charge.
- Must be compatible with the specific fan type (ceiling, pedestal, table, exhaust, or cabin fan).

##### 4. Replacement

- Installing the new condenser in correct position.
- Ensuring proper connections:
  - Correct polarity (if applicable)
  - Firm and safe electrical contacts
- Securing capacitor to prevent vibration or displacement.

##### 5. Cleaning and Servicing

- Optional cleaning of fan motor and blades.
- Lubricating bearings (if required).
- Ensuring no dust or debris remains inside motor.

##### 6. Reassembly & Refixing

- Closing fan motor housing securely.
- Refitting fan to its original location:
  - Hook/clamp for ceiling fan
  - Stand/base for pedestal or table fan

##### 7. Testing & Commissioning

- Powering fan and checking:
  - Smooth operation
  - Correct speed
  - No humming, sparking, or overheating

## 8. Labour & Materials

- Includes:
  - Cost of new condenser
  - Skilled labour for replacement and testing
  - Tools, wiring, and consumables

## 9. Credit of D.M.

- Old condenser (dismantled material) retained by agency.
- Its value is **credited against the item rate**, reducing cost of the work.

## 10. Completion

- Fan fully functional and safe to operate.
- Smooth, noiseless performance.

## 11. As Directed by Engineer-in-Charge

- All work carried out following standard electrical practices and site conditions.

Payment shall be made on **E.a.** basis.

## **Item No. 38 : Providing & erecting following type of Modular Type Accessories with necessary connection As desired by Engineer In charge. (1) 6 Amp. SP one way switch**

### **Specification Explained: Modular Type 6 Amp SP One-Way Switch**

#### **Scope of Work:**

Providing and erecting a **6 Ampere, single pole (SP), one-way modular switch** along with all necessary accessories, wiring, and connections, complete as per Engineer-in-Charge's instructions.

---

### **Detailed Breakdown of Work**

#### 1. Supply of Switch

- **Type:** Modular switch
- **Rating:** 6 Ampere
- **Function:** Single Pole (SP), One-Way
  - Controls a single electrical point from one location
- **Make/Brand:** Approved by Engineer-in-Charge

---

#### 2. Mounting Arrangement

- Switch to be mounted on:
  - **PVC / Metallic / Wooden modular box** (as per site)
  - Single mounting base frame
- Ensuring:
  - Proper alignment
  - Neat installation

### 3. Cover Plate

- Providing modular front cover plate:
    - Finish: White / Textured / Metallic (as approved)
  - Protects internal wiring and ensures aesthetic look
- 

### 4. Electrical Connections

- Connecting switch to the circuit:
    - Phase wire (live) connected to switch terminal
    - Load wire to the controlled point (light/fan/socket)
  - Ensuring:
    - Tight, safe, and correct connections
    - Compliance with electrical safety norms
- 

### 5. Accessories & Fasteners

- Including:
    - Screws
    - Brackets
    - Clips / fishers (if needed)
  - All necessary materials for secure fixing
- 

### 6. Testing

- Checking:
    - Proper ON/OFF operation
    - No sparking or loose connection
    - Firm installation
- 

### 7. Labour & Materials

- Includes:
    - Supply of switch and accessories
    - Skilled electrician for installation
    - Tools, consumables, and minor fittings
- 

### 8. Completion

- Switch should be:
    - Fully functional
    - Safely fixed
    - Neatly finished
- 

### 9. As Directed by Engineer-in-Charge

- Work executed according to site conditions and Engineer's instructions

**Item No. 39 : Providing & erecting following type of Modular Type Accessories with necessary connection As desired by Engineer In charge. (2) 16 Amp. SP one way switch**

Specification Explained: Modular Type 16 Amp SP One-Way Switch

**Scope of Work:**

Providing and erecting a **16 Ampere, single pole (SP), one-way modular switch** along with all necessary accessories, wiring, and connections, complete as per Engineer-in-Charge's instructions.

---

Detailed Breakdown of Work

1. Supply of Switch

**Type:** Modular switch

**Rating:** 16 Ampere

**Function:** Single Pole (SP), One-Way

Controls a single electrical point from one location

**Make/Brand:** Approved by Engineer-in-Charge

---

2. Mounting Arrangement

Switch to be mounted on:

**PVC / Metallic / Wooden modular box** (as per site requirement)

Single mounting base frame

Ensuring:

Proper alignment

Neat installation

---

3. Cover Plate

Providing **modular front cover plate:**

Finish options: White / Textured / Metallic (as approved)

Protects internal wiring and gives a neat appearance

---

4. Electrical Connections

Connecting switch to the circuit:

Phase wire (live) connected to switch terminal

Load wire to the controlled point (fan, light, appliance)

Ensuring:

Tight and safe connections

Compliance with electrical safety standards

---

5. Accessories & Fasteners

Including:

Screws

Brackets

Clips / fishers (if needed)

All necessary materials for secure fixing

---

6. Testing

Checking:

Proper ON/OFF operation

No sparking or loose connections

Firm and stable mounting

---

## 7. Labour & Materials

Includes:

Supply of switch and accessories

Skilled electrician for installation

Tools, consumables, and minor fittings

---

## 8. Completion

Switch should be:

Fully functional

Safely fixed

Neatly finished

---

## 9. As Directed by Engineer-in-Charge

Work executed according to site conditions and instructions

Payment shall be made on **E.a.** basis.

## **Item No. 40 : Providing & erecting following type of Modular Type Accessories with necessary connection As desired by Engineer In charge. (3) 6/16Amp. Universal socket**

Specification Explained: Modular Type 6/16 Amp Universal Socket

### **Scope of Work:**

Providing and erecting a **modular type universal socket** rated **6/16 Amp**, including all necessary accessories, wiring, and connections, complete as per Engineer-in-Charge's instructions.

---

### Detailed Breakdown of Work

#### 1. Supply of Universal Socket

**Type:** Modular universal socket

**Rating:** 6/16 Amp (suitable for both low and high power appliances)

**Function:** Accepts plugs of multiple types (e.g., 2-pin, 3-pin, round or flat pin)

**Make/Brand:** Approved by Engineer-in-Charge

Ensures:

Safe usage for various electrical appliances

Compliance with electrical safety standards

---

#### 2. Mounting Arrangement

Socket to be mounted on:

**PVC / Metallic / Wooden modular box** (as per site)

Single mounting base frame for modular accessories

Ensuring:

Proper alignment

Neat and flush fitting

#### 3. Cover Plate

Providing **modular front cover plate:**

Finish options: White / Textured / Metallic (as approved)

Protects wiring and gives aesthetic appearance

#### 4. Electrical Connections

Connecting socket to the electrical circuit:

Phase (live), neutral, and earth wires connected to appropriate terminals

Ensuring:

Tight and secure connections

Proper polarity and earthing

Compliance with electrical standards

#### 5. Accessories & Fasteners

Includes:

Screws

Brackets

Clips / fishers if needed

Ensures secure and stable installation

---

#### 6. Testing

Checking:

Proper functionality for different plug types

No loose connections

Safe earthing

---

#### 7. Labour & Materials

Includes:

Supply of socket and accessories

Skilled electrician for installation

Tools and consumables

---

#### 8. Completion

Socket should be:

Fully functional

Neatly installed

Safe to use

---

#### 9. As Directed by Engineer-in-Charge

Work executed according to site conditions and Engineer's instructions

Payment shall be made on **E.a.** basis.

### **Item No. 41 : Providing & erecting following type of Modular Type Accessories with necessary connection As desired by Engineer In charge. (4) 6 A socket**

Specification Explained: Modular Type 6 Amp Socket

#### **Scope of Work:**

Providing and erecting a **6 Amp modular socket** along with all necessary accessories, wiring, and connections, complete as per Engineer-in-Charge's instructions.

Detailed Breakdown of Work

##### 1. Supply of Socket

**Type:** Modular socket

**Rating:** 6 Amp

**Function:** Standard socket for low-power appliances (like lamps, fans, chargers)

**Make/Brand:** Approved by Engineer-in-Charge

Ensures:

Safe usage

Compliance with electrical safety standards

##### 2. Mounting Arrangement

Socket to be mounted on:

**PVC / Metallic / Wooden modular box** (as per site requirement)

Single mounting base frame for modular accessories

Ensuring:

Proper alignment

Flush and neat fitting

### 3. Cover Plate

Providing **modular front cover plate**:

Finish: White / Textured / Metallic (as approved)

Purpose:

Protects wiring

Gives a neat and aesthetic appearance

### 4. Electrical Connections

Connecting socket to the electrical circuit:

Phase (live), neutral, and earth wires connected to respective terminals

Ensuring:

Tight and secure connections

Proper earthing

Safe and reliable operation

### 5. Accessories & Fasteners

Includes:

Screws

Brackets

Clips / fishers if required

Ensures secure and stable installation

### 6. Testing

Checking:

Correct operation

No sparking, heating, or loose connection

Safe earthing

### 7. Labour & Materials

Includes:

Supply of socket and accessories

Skilled electrician labour for installation

Tools and consumables

### 8. Completion

Socket should be:

Fully functional

Safely installed

Neatly finished

### 9. As Directed by Engineer-in-Charge

Installation and connections done according to site conditions and Engineer's instructions

Payment shall be made on **E.a.** basis.



**Item No. 42 : Providing & erecting Switch board for Computer or electric apparatus consisting of following modular type accessories mounted with PVC / Metallic concealed /open box with single mounting base frame covered with textured / metallic /white front plate,modules erected with necessary connections as directed**

**1 no. 6A/16A universal plug-switch combined.**

**3 nos. 6A Switch**

**3 nos. 6A 5 pin Plug,**

**For Modular Type Accessories, Cat.III**

**Specification Explained: Modular Switchboard for Computer / Electrical Apparatus**

**Scope of Work:**

Providing and erecting a **modular switchboard** for computers or other electrical apparatus, complete with **modular accessories**, PVC/metallic concealed or open box, single mounting base frame, cover plate, and all necessary wiring and connections as directed by the Engineer-in-Charge.

**Detailed Breakdown of Work**

1. Switchboard Box

- **Type:** PVC / Metallic (concealed or open) modular box
- **Mounting:** Single base frame for modular accessories
- **Cover Plate:** Textured / Metallic / White finish (as approved)
- Ensures:
  - Protection of wiring
  - Neat, aesthetic appearance

2. Modular Accessories

The switchboard will include:

1. **6A/16A Universal Plug-Switch Combined (1 No.)**
    - Functions as a **plug point with ON/OFF switch**
    - Can accept multiple plug types (2-pin, 3-pin, flat/round)
  2. **6A Switches (3 Nos.)**
    - Single Pole (SP) switches
    - Controls lights or small electrical appliances
  3. **6A 5-Pin Plugs (3 Nos.)**
    - Standard 5-pin plugs for power supply
    - Suitable for computer or peripheral equipment
- All accessories should be **Modular Type, Category III**, ISI-approved quality.

3. Electrical Connections

- Proper wiring of all modules as per site and Engineer-in-Charge instructions:
  - Phase, Neutral, and Earth connections
  - Correct alignment of switches and plugs
  - Safe and reliable operation

#### 4. Accessories & Fasteners

- Includes all necessary fixing items:
  - Screws
  - Brackets
  - Clips / fishers
- Ensures firm and stable installation

#### 5. Testing

- After installation, test for:
  - Functionality of all switches and sockets
  - Safe earthing
  - No sparking or loose connections

#### 6. Labour & Materials

- Includes:
  - Supply of box, cover plate, and all modular accessories
  - Skilled electrician for installation and wiring
  - Tools, consumables, and minor fittings

#### 7. Completion

- Switchboard should be:
  - Fully functional and safe
  - Neatly installed
  - Aesthetically aligned with interior design

#### 8. As Directed by Engineer-in-Charge

- Installation to be executed according to site requirements and instructions

### **4. Measurement & Payment**

Payment shall be made on **E.a.** basis.

**Item No. 43 : Supplying and erecting LED indoor fittings with LEDs of wattage 0.2 Watt to 0.5 Watt assembled on single MCPCB, with housing used as a heat sink shall be made of thick sheet Steel conforming to IS: 513/CRCA/ aluminium die cast powder coated and high U.V. & corrosion resistance with diffuser with company mark/name 160V to 270V, Power Factor more than 0.95, THD < 15%, CCT 3000 K to 6500K, Luminaire efficacy > 85 lumens/watt, LED driver efficiency > 85 % (fitting required LM-79 & LM-80 Certificates) (NOTE: Below description have shown ranges of Wattage capacity of LED fittings. The Engineer incharge may select any wattage capacity between the ranges shown.) (A) Tube Light with integral driver (iii) 18-20 Watts, Surge - 2KV, IP-20, conventional 4 feet, Cat-III**

**Specification Explained: LED Indoor Tube Light (18–20 Watts, Cat-III)**

### **Scope of Work:**

Supplying and erecting **indoor LED tube light fittings** of 18–20 Watts, complete with integral driver, housing, diffuser, and all electrical connections as per Engineer-in-Charge's instructions.

### **Detailed Breakdown of Work**

#### 1. LED Source

- LEDs of **0.2–0.5 Watt** assembled on a **single MCPCB (Metal Core PCB)**.
- Ensures:
  - Uniform light distribution
  - Thermal management

#### 2. Housing / Body

- Made of either:
  - **Thick sheet steel conforming to IS:513 / CRCA**
  - **Aluminium die-cast**
- Powder-coated with **high UV and corrosion-resistant finish**
- Serves as a **heat sink** to improve LED life and performance

#### . Diffuser

- Proper **diffuser** to:
  - Ensure uniform light
  - Reduce glare
- Material and design must be durable and fire-resistant

#### 4. Electrical Specifications

- Input Voltage: **160V–270V AC**
- Power Factor: **> 0.95**
- Total Harmonic Distortion (THD): **< 15%**
- LED Driver Efficiency: **> 85%**
- Luminaire Efficacy: **> 85 lumens/watt**
- Surge Protection: **2 kV**
- IP Rating: **IP-20**

#### 5. Light Characteristics

- Correlated Color Temperature (CCT): **3000 K to 6500 K**
  - Warm white to cool white range <sup>75</sup>
- Required certifications for LED and luminaire:

- **LM-79** (Photometric test report)
- **LM-80** (LED performance and longevity)

## 6. Fitting Type

- **Tube light with integral driver**
- Conventional **4 feet length**
- Wattage: **18–20 W**
- Category: **Cat-III**
- Suitable for indoor environments

## 7. Installation / Erection

- Mounting the tube light:
  - Surface mounting or suitable holder as per site
- Connecting to mains supply safely
- Ensuring correct polarity and earthing
- Proper alignment to ensure uniform lighting

## 8. Labour & Materials

- Includes:
  - Supply of LED fitting
  - Fixing brackets or mounting accessories
  - Electrical wiring and terminations
  - Skilled electrician for installation

## 9. Testing & Commissioning

- Testing for:
  - Proper illumination
  - Smooth operation without flickering
  - Voltage, current, and power factor compliance

## 10. Completion

- Fitting should be:
  - Fully operational
  - Safely installed
  - Uniformly illuminated
  - Compliant with Cat-III standards and LM-79 / LM-80 certified

## 11. Engineer-in-Charge Selection

- Wattage selection within **18–20 W range** to be finalized by Engineer-in-Charge

Payment shall be made on **E.a.** basis.

**Item No. 44 : Demolition and disposal of unserviceable materials with all lead and lift. (i) Cement concrete.**

The work shall be executed as per the specification of "Item No. 20.1.(i) Page No. 147" of Building Specification Booklet.

The rate shall be for a unit of one Cum.

**Item No. 45 : Providing and applying two coats of Hybrid Polymer flexible acrylic coating of Sovacryl K-10 of Parex(Sika India) or approved equivalent brand with under coat adhesion promotor priming coat of Flow Prime WB of Parex( Sika India ) or approved equivalent make.Cleaning the existing surface throughly, chase open the crack available at surface and fill the same with crack filler material of approved brand. After application of 1st coat of Sovacryl K-10 on Flowprime WB, a fibre glass mesh of 45 GSM to be sandwiched between 1st & 2nd coat of Sovacryl K-10. The products shall be applied in strict accordance with the manufacturer's specification. (The crack filling shall be paid under relevant item).**

Specification Explained: Hybrid Polymer Flexible Acrylic Coating (Sovacryl K-10)

Scope of Work:

Providing and applying two coats of Hybrid Polymer flexible acrylic coating on a prepared surface, including priming, crack filling, and reinforcement with fiberglass mesh, as per manufacturer's guidelines and Engineer-in-Charge's instructions.

Detailed Breakdown of Work

**1. Surface Preparation**

Thoroughly clean the existing surface of dust, loose particles, oil, grease, or any contaminant. Open existing cracks on the surface using a chisel or cutter to create a groove for filling. Crack filling to be done using approved crack filler material (paid separately under relevant item).

**2. Priming**

Apply undercoat adhesion promotor / priming coat:

Material: Flow Prime WB (Parex/Sika India) or approved equivalent

Ensures:

Better adhesion of topcoat

Sealing of the substrate

**3. First Coat of Hybrid Polymer Coating**

Apply 1st coat of Sovacryl K-10 (Parex/Sika India or approved equivalent) over primed surface.

Immediately embed fiberglass mesh (45 GSM) into the wet first coat:

Ensures crack resistance

Reinforces the surface

Care to maintain uniform mesh placement without wrinkles

**4. Second Coat of Hybrid Polymer Coating**

Apply 2nd coat of Sovacryl K-10 over fiberglass mesh to sandwich it between first and second coat.

Achieve uniform thickness, smooth finish, and proper curing

## 5. Material Specifications

Hybrid Polymer Flexible Acrylic Coating: Sovacryl K-10

Flexible and crack-resistant

Suitable for exterior and interior surfaces

Fiberglass Mesh: 45 GSM

Provides reinforcement between coats

Primer / Adhesion Promotor: Flow Prime WB

Ensures proper bonding with substrate

## 6. Application Guidelines

All products applied strictly according to manufacturer's instructions

Coverage and thickness per product specification

Avoid application in extreme temperature or wet conditions unless specified by manufacturer

## 7. Labour & Materials

Includes:

Cleaning and surface preparation

Priming and two-coat application

Fiberglass mesh placement

Skilled painters for proper finish

Crack filling billed separately under relevant item

## 8. Completion

Surface should be:

Smooth and uniform

Free from air bubbles, peeling, or visible defects

Properly cured and adhered

## 9. Engineer-in-Charge Oversight

Work to be executed according to site conditions and manufacturer's specification under the direction of the Engineer-in-Charge.

**Payment shall be made on Sqm basis.**

**Item No. 46 : Providing and laying concrete 1:2:4 ( 1 cement :2 coarse Sand: 4 Graded Stone Aggregate 20 mm nominal size ) in proper gradient on terrace slab as directed by Engineer-in-charge to have proper slope for draining rain water including finishing top with floating coat of neat cement.**

**The work shall be executed as per the specification of "Item No. 5.4.1 Page No. 43 "of attached Building Specification Booklet.**

**Payment shall be made on Cum basis.**

**Item No. 47 : Providing & fixing of Waste Pipe for Wash basin & Urinal C.P. 40 mm dia. as per the instruction of Engineer-In-Charge.**

**23.124.(A) Providing and fixing urinal of approved quality including connection with trap and with integral longitudinal flush pipe squatting plate pattern white earthenware 550 mm. x 300 mm.**

**1.0. Materials :** The squatting plate pattern, white glazed earthenware urinal of 550 mm x 300 mm shall conform to I.S. 771-1063. It shall be test India make.

**2.0. Workmanship**

**2.1.** The squatting plate urinal shall be fixed as directed.

**2.2.** The top edge of the squatting plate shall be flush with the finished floor level adjacent to it. It shall be embedded on a layer of 25 mm. thick cement mortar 1:8 (1 cement: 8 fine sand) laid over a bed of burnt brickbat cement 1:5 :10( 1 cement: 5 fine sand, 10 graded brick aggregate 20 mm. nominal size). There shall be 100 mm. dia.

glazed earthenware or vitreous china channel as specified with stop and outlet pieces suitably fixed in floor in cement

mortar 1:3 (1 cement: 3 coarse sand) and joint finished with white cement. The earthenware vitreous china shall discharge into 65 mm. C.P. brass outlet grating. The trap and fitting shall be fixed as directed.

**3.0. Mode or measurements and payment**

**3.1.** The rate includes .cost of all materials, tools and plants and labour required for satisfactory completion of this item.

**3.2.** The rate shall be for a unit of Each

**Item No. 48 : Providing and fixing glazed louvered glass windows and ventilators with teak wood frame 10cm. x 7cm. size including 3 coats of oil painting to wood work etc. complete.**

Specification Explained: Glazed Louvered Glass Windows and Ventilators with Teak Wood Frame

Scope of Work:

Providing and fixing glazed louvered glass windows and ventilators with teak wood frames, including all necessary wood finishing, glass work, fittings, and painting as directed by Engineer-in-Charge.

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Detailed Breakdown of Work

**1. Teak Wood Frame**

Frame Size: 10 cm × 7 cm (width × depth)

Material: Teak wood, well-seasoned and free from knots or defects

Fabrication: Cut, joined, and assembled as per design specifications

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**2. Louvered Glass Windows / Ventilators**

Glazing: Glass panes fixed in the louvers

Louvered design: Adjustable or fixed slats for ventilation

Fittings: Necessary hinges, handles, and locking arrangements

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**3. Fixing**

Frames to be properly fixed in walls or openings using suitable fasteners

Ensure proper alignment, squareness, and stability of the assembly

Provide glazing beads or rubber gaskets to secure glass panes firmly

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**4. Painting / Finishing**

Three coats of oil paint on woodwork:

First coat: Primer / base coat

Second coat: Intermediate coat

Third coat: Finish coat

All surfaces properly sanded between coats for smooth finish

Ensures protection of teak wood and aesthetic appearance

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## 5. Accessories & Hardware

Hinges, handles, locks, and other necessary fixtures included

All hardware of approved quality and finish

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## 6. Labour & Materials

Includes:

Teak wood frame fabrication and fixing

Glass louvers supply and fixing

Oil painting (3 coats)

Skilled labour for precise installation and finishing

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## 7. Completion

Windows and ventilators should be:

Properly aligned and stable

Smooth in operation (louvers open/close freely)

Evenly painted and aesthetically finished

Glass panes securely fixed without rattling

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## 8. As Directed by Engineer-in-Charge

All work executed according to site conditions and design instructions

Payment shall be made on Sqm basis.

**Item No. 49 : Scientific cleaning of over head water tank and under ground sump including wall cleaning with turbolesor with high Pressure and removed sludge and impurities of suction operation in under ground water sump wt. and dry cleaning by vacuum pump disinfiucion with anti backterial agent and viral disinfection with U.V. radiation and mosquitto distroy with specific system etc. complete. (D) More Than 5000 litre capacity.**

**Specification Explained: Scientific Cleaning of Overhead Water Tank & Underground Sump (>5000 Litres)**

### Scope of Work:

Scientific cleaning and disinfection of **overhead water tanks and underground sumps** with a capacity of **more than 5000 litres**, including sludge removal, wall cleaning, vacuum drying, chemical and UV disinfection, and mosquito control, complete as per Engineer-in-Charge's instructions.

### Detailed Breakdown of Work

#### 1. Preliminary Work

- **Inspection:** Assess tank/sump condition, water level, and sludge accumulation
- **Drainage:** Remove existing water safely before cleaning
- **Safety Measures:** Ensure worker safety with ladders, harness, or scaffolding as required

#### 2. Wall and Surface Cleaning

- **High-Pressure Cleaning:** Use **Turbo Laser or high-pressure water jets** to remove dirt, biofilm, and algae from walls and floor
- **Scrubbing:** Manual or mechanical scrubbing of stubborn deposits if required



### 3. Sludge and Impurity Removal

- **Suction Operation for Underground Sumps:** Remove sludge, sediments, and debris with **industrial-grade suction systems**
- **Dry Cleaning:** Vacuum pump or dry methods to remove remaining particulate matter

### 4. Disinfection

- **Chemical Disinfection:** Apply **anti-bacterial and viral agents** approved for potable water systems
- **UV Disinfection:** Use **U.V. radiation** to neutralize bacteria, viruses, and other pathogens
- **Mosquito Control:** Apply **specific anti-mosquito treatment/system** to prevent breeding

### 5. Water Tank Specific Steps

- Overhead tanks:
  - Wall and floor cleaning
  - Sludge removal
  - Surface disinfection and drying
- Underground sumps:
  - Full suction of sludge
  - Dry cleaning by vacuum pump
  - Chemical and UV disinfection

### 6. Material & Equipment

- **Cleaning equipment:** Turbo cleaner / high-pressure jet, suction pump, vacuum pump
- **Disinfectants:** Anti-bacterial and viral agents approved for potable water
- **UV system:** Portable or fixed UV disinfection unit
- **Mosquito control agents:** Approved chemicals or devices

### 7. Labour & Materials

- Includes:
  - Skilled manpower for cleaning, suction, and chemical treatment
  - Protective gear for workers
  - All consumables, disinfectants, and UV operation

### 8. Testing & Quality Check

- **Post-cleaning water test:** Ensure water is safe, free from bacteria and pathogens
- **Tank inspection:** Walls, floor, and fittings clean and debris-free
- **Documentation:** Completion report for site records

### 9. Completion

- Tank and sump should be:
  - Free from sludge, dirt, and microbial contamination
  - Disinfected and safe for potable water
  - Mosquito-free

### 10. Engineer-in-Charge Oversight

- All operations carried out as per site requirements and under Engineer-in-Charge's instructions

Payment shall be made on **Litre** basis.

**Item No. 50 : Providing erecting and fixing double coated ISI water tank of required capacity each with all necessary fittings and connection etc. complete on terrace**

**Materials:**

Polyethylene water storage tank shall be of as per ID marked and IS 12701, this materials should be light weight, nontoxic all fitting materials shall be H.D.P.E. / Brass 1.2 The P.V.C. tank shall be of I.S.I. mark and approved quality and brand like infra or Syntax or equivalent. It shall be approved by Engineer in charge. The thickness of P.V.C. materials shall be as per Company's specification. The size of tank shall be decided by Engineer in charge.

**Workmanship:**

Water tank shall be installed on perfectly planed and smooth surface. Outlet pipe shall be 7.5 cm high then bottom surface. Diameter of overflow pipe shall be bigger than inlet pipe diameter. Unions shall be used in inlet and outlet pipe. For connection in water tank required vicer, and check-nuts shall be used. Fitting shall be done by G.I. / P.V.C. pipes as per instruction of Engineer in charge in each tank. All joints shall be leak proof.

**Mode of Measurement and Payment:**

This shall be measured in one liter basis and rates are as per liter basis for the volumetric capacity of the water tank. Rate shall be inclusive of placing, lifting, storing and making connection for inlet, outlet, overflow pipe, out pipe with all necessary plumbing work and material. For complete work.

**Item No. 51 : Providing and fixing to wall ceiling and floor 10.0 Kg. F/Cm2 working pressure poluthene pipes of the following outside Dia. Low density, complete with special falnge compression type fittings, wall clipsetc. including making good the wall ceiling and floor.(D) 40mm**

**1.0. Materials :** The low .density polythene pipe of specified diameter with 56 Kg/f. Sq. Cm. working pressure shall conform to I.S. 3076-1968. The specials and fittings required shall be of best quality.

**2.0. Workmanship**

**2.1.** The P.V.C Pipes of specified diameter shall be fixed as directed. Due to thermal expansion of rigid P-V.C. Pipes, due allowances shall be made particularly in over-ground pipe line for any change in length of pipe line which

may occur during installation or when pipe fine is in service.

**2.2.** Above ground installation of rigid P.V.C. pipe should be undertaking after precautions are observed for their protection again dirt, sun rays and mechanical damage.

**2.3.** The rigid P.V.C. tines should not be kept exposed above ground when it passes through public places, railway lines, roads, road side and foot paths.

**2.4.** P.V.C. pipe shall be supported at the following intervals ;  
-20 mm dia 500 mm. -25 mm. dia. 750 mm. -32 mm. dia. 900 mm.

**2.5.** Close support spacing shall be provided if recommended by the manufacturer.

**2.6.** The guide lines indicated by the manufacturer regarding handling, transportation, storing, laying and jointingof pipes shall be kept in view during execution.

**2.7.** P.V.C. pipes shall be fixed on wall with wooden plugs suitable plastic clamps.

**2.8. Jointing the pipes :**

**2.8.1.** The pipes and socket s shall be accurately cut. The ends of the pipes and fittings should be absolutely free

from dirt and dust. The outside surface of the pipes and the inside of the fittings shall then be roughened with emery

paper, and then solvent cement shall be applied to the matching surface and pushed home and joint. Since solvent

cement is aggressive to P.V.C. care must be taken to avoid applying excessive cement to the inside of pipe sockets as

any surplus cement cannot be wiped off after jointing. Empty solvent cement tins, brushes, rags of paper impregnated

with cement should not be buried in the trenches. They should be gathered, not left scattered about, as they can prove to be a hazard to animals, which may chew them.

**2.8.2.** If any manufacturer recommends its own methods of jointing the same shall be adopted after necessary approval from the Engineer-in-charge.

**2.9. Laying pipes in trenches:**

**2.9.1.** The pipes shall be laid over uniform relatively soft fine grained solid found to be free of presence of hard object such as large feints, rocky projections, large tree roots etc. The width of the trenches shall be minimum width

required for working.

**2.9.2.** The pipes laid underground shall not be less than one meter from the ground level. The pipe shall be positioned in the trenches so as to avoid any induced stresses due to retraction. Any deviation required shall be obtained by using proper type of rubber ring joints.

**3.0. Mode of measurements & payment**

**3.1.** The relevant specifications of item No. 23.2. (A) shall be followed except that the P.V.C. pipes of specified dia.

shall be paid under this item.

**3.2.** The unit rate shall be for a unit of One running meter.

**Item No. 52 : Providing and fixing 12.5 Litres low level flushing cistern with a pair, of C.I. or Mild brackets, complete with fittings such as lead valve less syphon, 15mm nominal size brass ball valve with polythene float, C.P brass handle unions and couplings for connections, with inlet, outlet and overflow pipes, 40mm dia. porcelain enamelled flush bend including cutting holes in walls and making good the same connecting the flush bend with cistern and closet (overflow pipe to be measured and paid for separately) (A) Vitreous China (I) In white colour**

**Specification Explained: 12.5 Litre Low-Level Flushing Cistern (Vitreous China, White)**

**Scope of Work:**

Providing and fixing a **12.5-litre low-level flushing cistern** with all required brackets, fittings, flush bend, and connections, complete as per Engineer-in-Charge's instructions.

**Detailed Breakdown of Work**

**1. Cistern Body**

- **Capacity:** 12.5 litres
- **Material:** Vitreous China, **white colour**
- **Type:** Low-level flush cistern (mounted on wall, low position relative to WC pan)

**2. Brackets / Supports**

- **Material:** Cast Iron (C.I.) or Mild Steel (MS) brackets
- **Purpose:** Firmly fix cistern on the wall
- Ensure proper alignment and stability

**3. Fittings**

- **Syphon:** Lead valve-less syphon for water discharge
- **Ball Valve:** 15 mm nominal size, brass, with polythene float
- **Handle / Flush Mechanism:** C.P. (Chrome Plated) brass handle for flushing
- **Unions and Couplings:** Brass for inlet/outlet connections

**4. Piping & Connections**

- **Inlet, Outlet, and Overflow Pipes:** Properly connected to cistern
- **Flush Bend:** 40 mm diameter, porcelain-enameled
  - Includes cutting holes in walls for flush bend installation
  - Making good the wall after fixing
- **Overflow Pipe:** Measured and paid separately

**5. Installation Requirements**

- Fix cistern with brackets, ensuring:
  - Horizontal and vertical alignment
  - Proper slope of flush bend

- Connect flush bend securely between cistern and WC pan
- Connect inlet pipe and test ball valve operation

## 6. Labour & Materials

- Includes:
  - Supply of cistern, fittings, and flush bend
  - Skilled plumber for installation
  - Cutting and making good walls
  - Sealing and testing all joints

## 7. Testing

- Check for:
  - Proper flushing operation
  - No leaks in inlet, outlet, or flush bend connections
  - Smooth operation of ball valve and handle

## 8. Completion

- Cistern should be:
  - Firmly fixed
  - Fully functional
  - Wall properly restored and neat
  - Aesthetic with white vitreous china finish

## 9. Engineer-in-Charge Oversight

- Work executed according to site conditions and design instructions

**The rate shall be for a unit of Each. Basis**

## **Item No. 53 : Providing and fixing Health Faucet Heavy duty with hook with fitting including all labour and materials as directed by engineer in charge.**

### **Specification Explained: Heavy-Duty Health Faucet with Hook**

#### **Scope of Work:**

Providing and fixing a **heavy-duty health faucet (hand spray bidet)** with hook, including all necessary fittings, connections, labour, and materials, as per Engineer-in-Charge's instructions.

#### **Detailed Breakdown of Work**

##### 1. Health Faucet

- **Type:** Heavy-duty hand-held bidet / health faucet
- **Material:** Stainless steel or brass, corrosion-resistant
- **Features:**
  - High durability for frequent use
  - Smooth operation of lever or trigger

##### 2. Hook / Holder

- **Purpose:** To hold the health faucet when not in use
- **Material:** Brass / stainless steel, corrosion-resistant
- Installed securely near the WC pan or location directed by Engineer

##### 3. Fittings & Connections

- Includes all necessary plumbing fittings for proper functioning:
  - Flexible pipe / hose connection to water supply
  - T-joint / angle valve if required
  - Screws, clamps, or other fastening accessories

##### 4. Installation Requirements

- Mount faucet and hook as per ergonomic placement
- Ensure leak-proof connections to water supply
- Verify smooth operation of faucet trigger or lever

##### 5. Labour & Materials

- Includes:
  - Supply of faucet, hook, and all fittings
  - Skilled plumber for installation
  - Necessary tools, clamps, and consumables

##### 6. Testing

- Check for:
  - Leak-free connections
  - Proper water flow and trigger operation
  - Firm mounting of faucet and hook

##### 7. Completion

- Health faucet should be:
  - Fully functional
  - Firmly mounted
  - Aesthetically installed
  - Easily operable

## 8. Engineer-in-Charge Oversight

- Installation executed according to site instructions and ergonomic placement

**The rate shall be for a unit of No. Basis**

**Item No. 54 : Providing and fixing pillar tap, capstan head, screw down high pressure with screws, shanks and back nuts.(ii) 20mm dia.**

The work shall be executed as per the specification of "Item No 23.95(A) Page No. 170 " of attached Building Specification Booklet.

Payment shall be made on **Each** basis.

**Item No. 55 : Providing and fixing flat back wash basin 550 mm x 400 mm size of first grade, white in colour with single hole for pillar trap with CI or MS brackets painted with including cutting holes and making good the same including providing and fixing CP brass wastecoupling 32mm dia including providing and fixing MI washer union 32 mm dia, including providing and fixing 15mm dia pillar tap capstan head screw down high pressure with screws, shanks and back nuts, including providing and fixing waste pipe 15mm x 600 mm pvc inlet connection 15mm brass screw down stop tap with necessary fittings etc. complete**

The work shall be executed as per the specification of "Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168" of attached Building Specification Booklet.

Payment shall be made on **Nos/Each** basis.

**Item No. 56 : Providing and fixing coloured wash down water closet (European type WC pan) with integral 'P' or 'S' trap with soil pipe in cement mortar 1:1 (1 cement : 1 fine sand) with coloured plastic seat cover with CP brass hinges and rubber buffers including cutting holes in wall and making good the same etc complete.**

**The work shall be executed as per the specification of "Item No. 23.111.(A)(I) Page No. 163 Item No. 23.113 (A) Page No. 165 Item No. 23.114 Page No. 165 Item No. 23.96 (A) + 23.00.4 Page No. 171" of attached Building Specification Booklet.**

Payment shall be made on **Nos/Each** basis.

**Item No. 57 : Providing and laying Acrylic Polymer type waterproofing treatment to terrace by Cutting out cracks of roof terrace to V- section , cleaning out, wetting , grouting with cement and sand slurry 1:3 (1-cement 3-sand ) including waterproofing Solutions in single coat then applying second coat of waterproofing materilas with white cement to seal the joints properly using brush as directed by Engineer in charge..**

Here's a clear breakdown of the specification you provided for **Acrylic Polymer waterproofing treatment on a terrace**:

Scope of Work:

Providing and laying an **Acrylic Polymer type waterproofing treatment** on the roof terrace.

### Step-by-Step Procedure:

1. **Preparation of Cracks:**
  - Identify all cracks on the roof terrace.
  - Cut the cracks into a **V-section** to ensure better bonding of repair materials.
  - Clean the cracks thoroughly to remove dust, debris, loose particles, or any contaminants.
2. **Wetting:**
  - Lightly **wet the cracks and surrounding surface** to aid proper bonding of the slurry and waterproofing solution.
3. **Grouting of Cracks:**
  - Prepare a **cement-sand slurry** in the ratio **1:3** (1 part cement, 3 parts sand).
  - Mix the slurry with **waterproofing solution** as per manufacturer's instructions.
  - Fill and **grout the cracks** thoroughly using this slurry to ensure proper filling.
4. **First Coat of Waterproofing:**
  - Apply the **first coat of Acrylic Polymer waterproofing solution** over the terrace surface, including the grouted cracks.
  - Use a **brush** for proper application.
  - Ensure uniform coverage and proper adhesion as per engineer's directions.
5. **Second Coat of Waterproofing (Sealing Joints):**
  - Apply a **second coat** of waterproofing material mixed with **white cement** specifically over joints and cracks.
  - This coat is aimed at **sealing joints properly** and providing a smooth, watertight finish.
  - Application should again be with a **brush** for precision.
6. **Curing and Inspection:**
  - Allow adequate **curing time** for the waterproofing layers as recommended by the manufacturer.
  - Final inspection to ensure **all cracks and joints are sealed**, and no leaks or voids remain.

### Materials Required:

- Acrylic Polymer Waterproofing Solution
- Cement
- Sand
- White Cement (for joint sealing)
- Clean Water
- Brushes for application

Payment shall be made on **Rmt.** basis.

**Item No. 58 : Lifting of submersible motor pump set complete with required No .& size of casing pipes by means of proper chain pulley block and pipe. wrenches. Job includes stacking of pipes chronologically after due checking of threads. (A) Up to 60 mtrs**

**Scope of Work:**

Lifting of a **submersible motor pump set** along with the required casing pipes, including proper handling, checking, and stacking, up to a depth of **60 meters**.

**Step-by-Step Procedure:**

1. **Preparation:**
  - Verify the **submersible pump set**, casing pipes, and accessories for correct **number, size, and condition**.
  - Ensure all **tools and equipment** are ready, including:
    - Chain pulley blocks
    - Pipe wrenches
    - Lifting chains or slings
    - Safety gear (helmets, gloves, harnesses, etc.)
2. **Lifting Arrangement:**
  - Install a **suitable chain pulley block** over the well or lifting point.
  - Securely attach lifting chains or slings to the pump set and connected casing pipes.
  - Ensure proper alignment to avoid **bending or damaging the pump or pipes** during lifting.
3. **Lifting the Pump and Pipes:**
  - Lift the pump and attached casing pipes **slowly and steadily** using the pulley block.
  - Avoid **sudden jerks** to prevent thread damage on pipes or misalignment of pump parts.
  - If multiple sections of casing pipe are present, lift them **sequentially**.
4. **Thread Inspection:**
  - During lifting, **check the threads** of all casing pipes carefully for:
    - Damage
    - Debris
    - Proper alignment
  - Clean and lubricate threads if required to prevent seizing.
5. **Stacking of Casing Pipes:**
  - After lifting, **stack the pipes chronologically** according to their position in the well (from top to bottom or vice versa).
  - Ensure **no twisting or bending** occurs and that the pipes are **stable** and secure for storage or reinstallation.
6. **Final Checks:**
  - Inspect the **pump and all lifted components** for any damage during lifting.
  - Confirm all threads are intact and ready for reinstallation if required.
  - Record any observations for **maintenance logs or reporting**.

**Tools and Equipment Required:**

- Chain pulley block
- Pipe wrenches
- Lifting chains or slings
- Safety equipment (helmets, gloves, harnesses)
- Cleaning brushes or cloth for threads

- **The rate shall be for a unit of one Per job basis.**



## **Item No. 59 : Replacement of bronze/ carbon thrust bearing with fibre plate & housing for (B) 200 mm dia.**

Scope of Work:

Replacement of a **bronze or carbon thrust bearing** with a **fibre thrust plate and bearing housing** for a shaft or pump system, specifically for **200 mm diameter**.

Step-by-Step Procedure:

1. **Preparation:**
  - Ensure the machine/pump is **completely shut down** and **disconnected from power**.
  - Gather all necessary tools and materials:
    - Replacement fibre thrust plate
    - New bearing housing (if required)
    - Wrenches, pullers, or relevant mechanical tools
    - Lubricants (if specified)
2. **Removal of Existing Bearing:**
  - Carefully **dismantle the pump or rotating assembly** to access the thrust bearing.
  - Remove the **old bronze or carbon thrust bearing** without damaging the shaft or surrounding components.
  - Inspect the **shaft and housing** for wear, scoring, or misalignment.
3. **Cleaning and Inspection:**
  - Clean the bearing seat and housing thoroughly.
  - Check alignment and dimensions to ensure compatibility with the **replacement fibre plate**.
  - Remove any debris, old grease, or corrosion.
4. **Installation of Fibre Thrust Plate:**
  - Place the **fibre thrust plate** in the housing, ensuring it sits **flush and properly aligned**.
  - Install the **bearing housing** if it is part of the replacement.
  - Check that the plate and bearing assembly allow **smooth rotation** of the shaft without binding.
5. **Assembly:**
  - Reassemble all pump components in reverse order of disassembly.
  - Ensure proper alignment of the shaft and thrust bearing.
  - Apply lubricants if required (as per manufacturer's instructions).
6. **Testing:**
  - Rotate the shaft manually first to ensure **smooth operation**.
  - Reconnect power and perform a **trial run** under no-load conditions.
  - Monitor for **abnormal noise, vibration, or heating**.

Materials Required:

- Fibre thrust plate suitable for 200 mm shaft
- Bearing housing (if replacement needed)
- Lubricant (as per specification)
- Standard mechanical tools (wrenches, pullers, alignment tools)

**The rate shall be for a unit of one E.a.**

**Item No. 60 : Rewinding of submersible motor by using approved make PVC insulated copper winding Cores of suitable size complete with connection. Capacity Suitable for pump of following size. Dismantled Materials to be retained by agency. (B) 7.5 H.P**

Scope of Work:

Rewinding of a **7.5 H.P. submersible motor** using **PVC-insulated copper winding cores**, including proper connections and retention of dismantled materials by the agency.

Step-by-Step Procedure:

1. **Preparation:**
  - Ensure the motor is **completely disconnected from power** and removed safely from the well or installation site.
  - Gather **tools and materials**:
    - PVC-insulated copper winding cores (approved make)
    - Soldering/connection tools
    - Insulating varnish or resin (if required)
    - Standard electrical and mechanical tools
2. **Dismantling the Motor:**
  - Carefully dismantle the motor to access the **stator and rotor**.
  - Remove the **old windings**, noting their **connections and winding pattern**.
  - Keep all **dismantled materials** organized as they will be retained by the agency.
3. **Inspection:**
  - Check the **stator and rotor cores** for wear, damage, or insulation breakdown.
  - Ensure the core slots are clean and free of debris.
4. **Winding Installation:**
  - Select **PVC-insulated copper winding cores** of suitable size as per motor specifications.
  - Rewind the stator (and rotor if required) with proper **turns, coil spacing, and phasing**.
  - Ensure **connections** match the original motor configuration.
5. **Insulation and Assembly:**
  - Apply **insulation varnish or resin** to secure the windings and provide electrical insulation.
  - Reassemble the motor carefully, ensuring **alignment and tight fitting**.
6. **Testing:**
  - Perform **continuity and insulation resistance tests**.
  - Conduct a **no-load trial run** to check for smooth operation, absence of abnormal noise, and correct rotation.
7. **Material Retention:**
  - Collect and hand over all **dismantled materials** (old copper windings, cores, etc.) to the agency, as required.

Materials Required:

- PVC-insulated copper winding cores (approved make)
- Insulating varnish/resin
- Standard electrical tools
- Soldering equipment and connections

Payment shall be made on **E.a** basis.

**Item No. 61 : Replacement of motor bush, upper/ lower with sleeve with following material (A) Bronze (ii) 200 mm. dia.**

Scope of Work:

Replacement of **upper and/or lower motor bushes** with new **sleeves**, specifically **bronze material**, for a motor shaft of **200 mm diameter**.

Step-by-Step Procedure:

1. **Preparation:**
  - Ensure the motor is **completely shut down and disconnected** from power.
  - Gather all necessary tools and materials:
    - Bronze motor bush (upper/lower) with sleeve
    - Wrenches, pullers, and alignment tools
    - Lubricants (if required)
    - Cleaning brushes/cloths
2. **Dismantling Existing Bushes:**
  - Carefully dismantle the motor to access the **upper and lower bushings**.
  - Remove the **old bush and sleeve** without damaging the shaft or housing.
  - Inspect the shaft and housing for **wear or scoring** that may require minor machining.
3. **Cleaning and Inspection:**
  - Clean the **bush seat and surrounding area** thoroughly.
  - Check **shaft diameter and housing dimensions** to ensure compatibility with the new bronze bush.
4. **Installation of New Bronze Bush:**
  - Fit the **bronze bush with sleeve** into the housing.
  - Ensure the bush is **properly seated and aligned** with the motor shaft.
  - Apply lubricants if specified to allow smooth rotation.
5. **Reassembly:**
  - Reassemble the motor components carefully, maintaining correct alignment.
  - Check for **free rotation** of the motor shaft within the new bush.
6. **Testing:**
  - Conduct a **trial run** to ensure smooth operation without unusual noise or vibration.
  - Inspect for **proper seating and alignment** under operational conditions.

Materials Required:

- Bronze motor bush with sleeve (upper/lower) suitable for 200 mm shaft
- Lubricants (if required)
- Standard mechanical tools (wrenches, pullers, alignment tools)

The rate shall be for a unit of **E.a.**

## **Item No. 62 : Replacement of Bowl bearing/ bush (B) Lead (ii) 200 mm. dia.**

### Scope of Work:

Replacement of **bowl bearing or bush made of lead** for a motor, pump, or rotating shaft assembly with a **shaft diameter of 200 mm**.

### Step-by-Step Procedure:

1. **Preparation:**
  - Ensure the **machine/pump is shut down, isolated from power**, and safe for maintenance.
  - Arrange required **tools and materials**:
    - Lead bowl bearing/bush (suitable for 200 mm shaft)
    - Wrenches, pullers, hammers, alignment tools
    - Lubricants (if applicable)
    - Cleaning tools (brushes, cloths)
2. **Dismantling the Old Bearing/Bush:**
  - Remove the **rotor/shaft assembly** to access the bearing housing.
  - Carefully extract the **existing lead bowl bearing/bush** using pullers or suitable mechanical tools.
  - Avoid **damage to the shaft or housing surfaces** during removal.
3. **Inspection and Cleaning:**
  - Inspect the **shaft journal and housing** for wear, scoring, or deformation.
  - Clean the **bearing seat and housing** thoroughly to ensure proper seating of the new bearing.
4. **Installation of New Lead Bearing/Bush:**
  - Place the **new lead bowl bearing/bush** into the housing, ensuring it is **aligned correctly with the shaft**.
  - Apply lubricants if required for smooth operation.
  - Ensure the bearing is **seated firmly** without gaps or misalignment.
5. **Reassembly:**
  - Reinstall the shaft or rotor assembly carefully into the new bearing.
  - Confirm that the shaft rotates freely and smoothly without resistance or wobble.
6. **Testing:**
  - Conduct a **trial rotation under no-load conditions**.
  - Observe for **vibration, noise, or excessive heating**, which could indicate misalignment or improper installation.

### Materials Required:

- Lead bowl bearing/bush for 200 mm shaft
- Lubricants (as specified)
- Standard mechanical tools (wrenches, pullers, alignment tools)

Payment shall be made on **E.a** basis.

**Item No. 63 : Providing Water proof straight Joint in PVC insulated flat flexible copper cable by using insulating material, water proofing material, & making the joint complete. (A) Up to 10Sq. mm .**

Scope of Work:

Making a **waterproof straight joint** in a **PVC-insulated, flat, flexible copper cable** of cross-section **up to 10 sq. mm** using appropriate **insulating and waterproofing materials**.

Step-by-Step Procedure:

1. **Preparation:**
  - **Disconnect the cable** from all power sources to ensure safety.
  - Gather required materials and tools:
    - Insulating tape (PVC or equivalent)
    - Waterproofing compound or resin
    - Heat-shrink tubing (if specified)
    - Wire strippers, pliers, soldering equipment (if soldered joint)
2. **Cable Preparation:**
  - Strip the **insulation from the ends** of both cable sections to expose the copper conductor.
  - Clean the exposed copper thoroughly to remove oxides or dirt.
3. **Making the Joint:**
  - **Twist or crimp the copper conductors** together.
  - For better conductivity and strength, the joint may be **soldered** (if approved).
  - Ensure a **secure mechanical and electrical connection**.
4. **Insulation and Waterproofing:**
  - Wrap the joint with **insulating tape** to prevent short circuits.
  - Apply **waterproofing material** (such as a resin or waterproof tape) around the joint to prevent moisture ingress.
  - Use **heat-shrink tubing** over the joint if required, ensuring a tight seal.
5. **Final Checks:**
  - Check the joint for **mechanical strength** and **proper insulation**.
  - Ensure there is **no exposed copper**.
  - Test the continuity of the cable to verify the electrical connection.

Materials Required:

- PVC-insulated copper cable (existing)
- Insulating tape (PVC or approved)
- Waterproofing material/resin
- Heat-shrink tubing (if applicable)
- Standard electrical tools (wire stripper, pliers, soldering iron)

**The rate shall be for a unit of one E.a.**

## **Item No. 64 : Providing and erecting ISI marked PVC insulated PVC Sheathed Flat flexible Submersible copper cable approved make of following Size. (C) 3 Core x 4 Sq. mm**

### Scope of Work:

Supply and installation of **ISI-marked PVC-insulated, PVC-sheathed, flat flexible submersible copper cable** of size **3-core × 4 sq. mm**, approved make, suitable for submersible pump connections.

### Step-by-Step Procedure:

1. **Material Verification:**
  - Procure **ISI-marked submersible cable** of **3-core × 4 sq. mm**, approved by the Engineer.
  - Check **manufacturer certification, ISI mark, and quality of insulation and sheath.**
2. **Route Preparation:**
  - Inspect and prepare the **cable path**, ensuring it is free of sharp edges, debris, or obstructions.
  - Ensure the route is **safe, dry, and accessible** for laying the cable.
3. **Cable Laying / Erection:**
  - Uncoil the cable carefully to avoid **kinks or twists.**
  - Lay the cable along the designated route, securing it with **cable clamps, saddles, or ties** at regular intervals.
  - Avoid excessive tension while pulling the cable, especially at bends.
4. **Termination:**
  - Strip the insulation carefully at both ends, exposing the copper conductors.
  - Connect the conductors to the **submersible motor or terminal box** as per electrical specifications.
  - Ensure **tight, corrosion-free connections** using proper tools.
5. **Insulation and Protection:**
  - Verify proper insulation and ensure the cable is **waterproof and protected along its length.**
  - Ensure that bends comply with the **minimum bending radius** of the cable.
6. **Testing:**
  - Perform continuity and insulation resistance tests before energizing.
  - Confirm that the cable is **properly laid, connections are secure**, and no conductors are exposed.

### Materials Required:

- ISI-marked **PVC-insulated, PVC-sheathed submersible cable** (3-core × 4 sq. mm)
- Cable clamps, ties, or saddles
- Electrical tools: strippers, crimpers, screwdrivers

### Measurement

**Measured per number Mtr.**

**Item No. 65 : Supply of following size of TOP & BOTTOM accessories i.e. Adaptor set (CI) long, pump guard set, starter pipe Rubber ring for submersible pump & UPVC column pipe as directed by Engineer - in - charge with necessary plumbing as desired. [F] 80 mm dia**

Scope of Work:

Supply and installation of **top and bottom accessories** for a submersible pump system, including adaptor sets, pump guard set, starter pipe, rubber rings, and UPVC column pipe, **80 mm diameter**, with necessary plumbing as directed by the Engineer-in-Charge.

Step-by-Step Procedure:

1. **Material Supply:**
  - Provide the following **approved accessories**:
    - **Adaptor set (CI) long** – for connecting pump to column pipe
    - **Pump guard set** – for protecting the pump intake
    - **Starter pipe** – as required for alignment with pump and column pipe
    - **Rubber ring/gasket** – for sealing joints and preventing leakage
    - **UPVC column pipe** – 80 mm diameter, as specified
  - Ensure all items are **of approved make and ISI/ISO quality**.
2. **Preparation:**
  - Inspect all supplied components for **defects or damage**.
  - Prepare the site and the pump for assembly.
3. **Installation – Bottom Accessories:**
  - Install the **pump guard set** at the pump suction end.
  - Fit the **starter pipe** with rubber rings for sealing.
  - Ensure **proper alignment** of the pump and column pipe connection.
4. **Installation – Column Pipe:**
  - Erect the **80 mm UPVC column pipe** vertically as per design.
  - Connect it securely with the **adaptor set (CI long)** to the pump.
  - Use **rubber rings or gaskets** at all joints to ensure a **waterproof seal**.
5. **Installation – Top Accessories:**
  - Connect the **top adaptor set and necessary fittings** to the column pipe.
  - Ensure alignment for connection to the **delivery pipeline or headworks**.
6. **Final Checks:**
  - Inspect all joints for **tightness and leak-proof installation**.
  - Verify proper vertical alignment of the column pipe.
  - Perform a **trial run** of the pump if required, observing for leakage or vibration.

Materials Required:

- CI adaptor set (long)
- Pump guard set
- Starter pipe
- Rubber rings / gaskets
- 80 mm diameter UPVC column pipe
- Plumbing tools (wrenches, sealant, alignment tools)

Measurement

- Measured in Per set

**Item No. 66 : Lowering of submersible motor pump set at the depth of following ,complete with required. Nos. and size of casing pipes erected by means of proper chain pulley block & pipe wrenches after checking of threads of each pipe with coupling to take the load of the pump set and pipe assembly filled up with water (A) Up to 60 mtrs.**

Scope of Work:

Lowering a **submersible motor pump set**, along with the required number and size of **casing pipes**, into a well or borehole up to a **depth of 60 m**, using proper lifting/lowering equipment and ensuring safe and correct assembly.

Step-by-Step Procedure:

**Preparation:**

Verify the **submersible pump set** and all associated **casing pipes** for size, number, and condition.

Inspect all **threads and couplings** for damage.

Ensure availability of necessary **equipment**:

Chain pulley block

Pipe wrenches

Lifting chains or slings

Safety gear (helmets, gloves, harnesses)

**Assembly of Pump and Casing Pipes:**

Assemble the **casing pipes sequentially**, checking and cleaning threads for proper engagement.

Attach the **pump set securely** to the bottom of the casing pipe assembly.

Fill the casing pipes with **water** to reduce the weight stress during lowering (hydraulic cushioning).

**Lowering Operation:**

Set up the **chain pulley block** over the well or borehole.

Slowly **lower the pump and casing assembly** into the borehole.

Ensure **controlled, steady movement** to prevent twisting, misalignment, or thread damage.

**Thread and Coupling Verification:**

Check **each pipe joint and coupling** during lowering to ensure proper alignment and load distribution.

Re-tighten or adjust any **misaligned threads** carefully.

**Final Positioning:**

Once the pump reaches the correct depth, verify that the **pump is properly seated** at the well bottom.

Confirm that all **casing pipes are vertical, aligned, and stable**.

**Testing:**

If required, conduct preliminary **water run** to ensure no leakage at joints and correct operation of the pump assembly.



Materials and Equipment Required:

Submersible motor pump set

Required casing pipes and couplings (as per pump specifications)

Chain pulley block

Pipe wrenches and hand tools

Water for filling pipes during lowering

Safety equipment

Measurement

The rate shall be for a unit of per job

**Item No. 67 : Dismantling tiled of Stone floor laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift.**

The work shall be executed as per the specification of "Item No. 20.23. Page No. 148 " of Building Specification Booklet.

The rate shall be for a unit of one sq. meter

**Item No. 68 : Dismantling C.I. pipes G.S. W.pipes and A.C. rain water pipes with fittings and clamps including stacking the materials with all lead and lift (for any dia, of pipe)**

The work shall be executed as per the specification of "Item No. 20.56. Page No. 151 " of Building Specification Booklet.

The rate shall be for a unit of one Running Meter.

## Item No. 69 : CHIPPING EXIST CONC

Surface of member should be checked for sounding using hammer. The damaged / delaminated portion will sound hollow. The same should be marked to regular geometrical shapes. The edges should be grooved using slim and powerful 850W (230V) corded angle grinder about 25 mm deep. Grinder to have no load speed of 11500 rpm with on / off side switch and for use of cutting disc upto 100 mm. Concrete within the grooved area should be removed using High performance chipper hammer featuring low weight & low vibration having single impact energy of 7.5 J, full hammering frequency of 3180 impacts/minute, maximum chiselling performance of 900 cm<sup>3</sup>/min, weighted emission sound pressure level of 94 dB (A) according to EN 60745, Triaxial vibration for chiseling in concrete 12. m/s<sup>2</sup> according to 60745-2-6 and having weight according to EPTA procedure 01/2003 of 5.6 Kgs

Scope of Work:

Removal of **damaged or delaminated concrete** from structural members using proper inspection and high-performance equipment, ensuring safe, controlled, and precise removal.

Step-by-Step Procedure:

### 1. Inspection and Marking:

- Check the **concrete surface by sounding** with a hammer.
- Identify areas that **sound hollow** (indicating delamination or damage).
- Mark these areas into **regular geometric shapes** (rectangular or square) for controlled removal.

### 2. Grooving Edges:

- Use a **corded angle grinder** to groove the edges of the marked area:
  - Power: **850 W, 230 V**
  - No-load speed: **11,500 rpm**
  - Cutting disc diameter: up to **100 mm**
  - Groove depth: **approximately 25 mm**
- Grinder should have an **on/off side switch** for safety and control.

### 3. Concrete Chipping:

- Remove the concrete within the grooved area using a **high-performance chipper hammer**:
  - Low weight & low vibration for operator safety
  - Single impact energy: **7.5 J**
  - Hammering frequency: **3,180 impacts/min**
  - Maximum chiselling performance: **900 cm<sup>3</sup>/min**
  - Weighted emission sound pressure level: **94 dB(A)** (EN 60745)
  - Triaxial vibration for chiselling in concrete: **12 m/s<sup>2</sup>** (EN 60745-2-6)
  - Tool weight: **5.6 kg** (EPTA procedure 01/2003)
- Ensure **concrete is removed fully**, leaving a clean substrate for repair.

### 4. Safety and Quality Checks:

- Use **personal protective equipment (PPE)**: helmet, goggles, gloves, ear protection, dust mask.
- Inspect the chipped area to ensure **all delaminated concrete is removed**.
- Check the edges are **clean and regular** for subsequent repair works.

#### Equipment and Materials Required:

- Corded angle grinder (850 W, 230 V, disc up to 100 mm)
- High-performance chipper hammer (specifications as above)
- Hammer for sounding
- Marking tools
- PPE: helmets, goggles, gloves, dust mask, ear protection

**The rate shall be for a unit of one sq. meter.**

#### **Item No. 70 : P/A ANTI CORROSIVE**

**REINFORCEMENT: Providing and applying anti corrosive rust remover "Rusticide" of M/S Sunanda speciality coating pvt. Ltd. or equivalent approved including cleaning the reinforcement bars with wire brush or air blowing including removing of all loose particle with applying rust remover thoroughly on reinforcement bars by using cotton waste swab etc. comp. with all the required tools, tackles, labourers as required and as directed by the Engineer in charge. (Area of Concrete treated with poymer modified mortar shall be measured for payment please)**

#### Scope of Work:

Application of an **anti-corrosive rust remover ("Rusticide")** on exposed reinforcement bars before repair, including cleaning and preparation, to prevent corrosion and ensure proper bonding with repair materials.

#### Step-by-Step Procedure:

##### **Surface Preparation:**

Clean exposed **reinforcement bars** using **wire brushes** or **air blowing** to remove:

Loose rust

Dirt, dust, and debris

Ensure the surface is **dry and free of loose particles** before applying rust remover.

##### **Application of Anti-Corrosive Treatment:**

Use **Rusticide** of **M/s Sunanda Speciality Coating Pvt. Ltd.** or equivalent approved brand.

Apply thoroughly using:

**Cotton waste swabs**, brushes, or other approved applicators

Ensure **all surfaces of the reinforcement** are treated evenly

Repeat application if required for **thick rust layers**.

##### **Post-Application Handling:**

Allow the treatment to **react as per manufacturer's instructions**.

Remove excess material if necessary.

Ensure **reinforcement is ready for subsequent repair** with polymer-modified mortar.

##### **Measurement and Payment:**

The **area of concrete treated with polymer-modified mortar** (not just the steel surface) will be measured for payment.

Include all tools, tackles, and labor required for the application.

Materials and Equipment Required:

Anti-corrosive rust remover ("Rusticide") – approved make

Wire brushes or air blower

Cotton waste, swabs, or brushes for application

PPE: gloves, goggles, masks

Standard tools and tackles for handling and cleaning

The rate shall be for a unit of one sq. meter.

**Item No. 71 : P/A STEEL PROTECTIVE COATING: Providing and Applying Steel protective coating: The exposed and cleaned reinforcement bars shall be applied with a single component cementitious corrosion inhibiting primer which shall be applied on the surface using suitable brush. Product: Mucis Protozione Ferro Mono of Thermax (Area of Concrete treated with polymer modified mortar shall be measured for payment please)**

Scope of Work:

Application of a **cementitious corrosion-inhibiting primer** on **exposed and cleaned reinforcement bars** to protect steel from corrosion before repair, ensuring proper adhesion and long-term durability.

Step-by-Step Procedure:

1. **Surface Preparation:**
  - Ensure all **reinforcement bars are cleaned and free of rust, dust, grease, or loose particles.**
  - Use **wire brushes, air blowers, or other suitable tools** to prepare the steel surface.
  - Verify that the surface is **dry and sound** before applying the primer.
2. **Application of Protective Coating:**
  - Use **single-component cementitious corrosion-inhibiting primer**, specifically:
    - **Product:** Mucis Protozione Ferro Mono by Thermax (or approved equivalent)
  - Apply **uniformly using a suitable brush** on all exposed steel surfaces.
  - Ensure **complete coverage**, including corners and inaccessible areas.
3. **Curing / Setting:**
  - Allow the primer to **set as per manufacturer's instructions** before applying polymer-modified mortar.
  - Ensure no contamination of the coated steel surface before further repair.
4. **Measurement and Payment:**
  - Payment will be made based on **the area of concrete treated with polymer-modified mortar**, not just steel area.
  - Include **all labor, tools, and tackles** required for proper application.

Materials and Equipment Required:

- Cementitious corrosion-inhibiting primer (Mucis Protozione Ferro Mono or equivalent)
- Wire brushes, air blowers for cleaning
- Suitable brushes for primer application
- PPE: gloves, goggles, mask
- Standard tools and tackles for handling steel and primer

Payment shall be made on Sqm basis.

**Item No. 72 : Bonding Coat** Providing and applying bond coat on the prepared surface to receive new polymer mortar / polymer modified concrete, with application of bonding coat of slurry made of Polyalk EP of M /S Sunanda Speciality Coating Private Ltd or of equivalent approved brand and manufacture in the weight proportion of 1 :2 (1 cement 2 Polyalk EP) or / Lanco 751 of Parex Chemicals or Krishna Conchem as per manufactures specification over the cleaned and dried old concrete surface in one full coat Laying of reinforcement polymer mortar or micro concrete shall b completed within the overlay time of bonding coat This coat s bonding agent between old and new concrete and also acts as 'barrier coat' to the migration of chloride ions from host concrete Item rate is inclusive of the materials all labour ,scaffolding, supervision, tools and tackles and transportation etc complete a per specification and as directe To ensure proper bonding between old and new concre application of bonding coat of slurry made of Polyalk EP of M /S Sunanda Speciality Coating Private Ltd or of equivalent approved brand and manufacture in the weight proportion of 1 :2 (1 Cement : 2 Polyalk EP) or Lanco 751 of Parex Chemical as per manufactures specification over the cleaned and dried old concrete surface

#### **Specification: Bond Coat for Polymer-Modified Concrete**

##### Scope of Work

Providing and applying a **bond coat** on a prepared old concrete surface to ensure proper adhesion of **new polymer mortar or polymer-modified concrete/micro-concrete**, while also acting as a **barrier to chloride migration**.

##### Step-by-Step Procedure

###### *1. Surface Preparation*

- Thoroughly clean the old concrete surface to remove:
  - Loose concrete particles
  - Dust, oil, grease, or any contaminants
- Ensure the surface is **dry, sound, and ready** for bonding coat application.

###### *2. Preparation of Bonding Coat Slurry*

- Use one of the approved materials:
  - **Polyalk EP** by M/s Sunanda Speciality Coating Pvt. Ltd.
  - **Lanco 751** by Parex Chemicals
  - **Krishna Conchem** or equivalent approved brand
- Mix the bonding coat in the **weight proportion of 1:2 (1 cement : 2 Polyalk EP)** or as per manufacturer's instructions.

###### *3. Application of Bonding Coat*

- Apply a **uniform full coat** of the slurry over the cleaned and dried surface using a **brush or suitable applicator**.
- Ensure **complete coverage**, including edges, corners, and joints.
- Avoid **pooling or uneven application**.

###### *4. Overlay Timing*

- Lay the **reinforcement, polymer mortar, or micro-concrete** within the **overlay time** specified by the manufacturer to ensure proper adhesion.

## 5. Functionality

- Acts as a **bonding agent** between old and new concrete.
- Serves as a **barrier coat** to prevent migration of chloride ions from the host concrete.

## Measurement and Payment

- The item rate includes:
  - **Materials:** bonding coat, cement, Polyalk EP
  - **Labour,** scaffolding, supervision
  - **Tools, tackles, and transportation**
- Work must be executed **as per specification and directions of Engineer-in-Charge.**

## Materials and Equipment Required

- **Bonding agent:** Polyalk EP / Lanco 751 / Krishna Conchem (approved)
- **Ordinary Portland Cement** (for mixing as per ratio)
- **Brushes or trowels** for application
- **Cleaning tools:** wire brush, air blower, etc.
- **PPE:** gloves, goggles, masks
- **Standard scaffolding, tools, and tackles**

Payment shall be made on **Sqm** basis.

**Item No. 73 : P&A POLYMER MODIFIED CEMENT MORTAR Applying Corrosion Resistance single Component polymer modified cement mortar to patch up the damaged concrete section in planks of upto 25mm thickness Providing and a g and applying Corrosion Resistance Single Component, polymer modified, fiber reinforced cementitious repair mortar having water powder ratio in the range of 0.16 and the mixed density of around 2.05 - 2.20 Gms/cc. The repair mortar shall achieve a minimum compressive strength of 45 MPa @ 28 days when tested as per ASTM C -109 and a flexural strength of 7 MPa when tested as per ASTM C 348. It shall achieve a minimum Adhesion Bond Strength of 2 MPa when tested on Standard Elcometer as per ASTM D 4541 - 8 The modulus of Elasticity shall be a minimum of 28 kN/mm<sup>2</sup> when tested as per BS 1881. Product: corrosion resistance single Component, polymer modified, fibre reinforced cementitious of M/s. Fosroc (Renderoc SP-40), Parex (Lanko-731).**

**Specification: Polymer Modified Cement Mortar (Corrosion Resistant Repair Mortar)**

**1. Scope of Work**

Providing and applying **single-component, polymer modified, fiber-reinforced cementitious repair mortar** for patch repair of damaged concrete surfaces in layers up to **25 mm thickness**, including surface preparation, application, and curing.

**2. Material Description**

The repair mortar shall be:

- **Single component (ready-to-use dry powder)**
- **Polymer modified**
- **Fiber reinforced**
- Cementitious in nature
- Designed for **corrosion resistance and structural repair**

**3. Approved Products**

The material shall be equivalent to:

- Fosroc Renderoc SP-40 by Fosroc
- Parex Lanko 731 by Parex

(Or approved equivalent meeting all specifications)

**4. Technical Properties**

Fresh Properties

- **Water–Powder Ratio:** ~0.16
- **Mixed Density:** 2.05 – 2.20 g/cc

## Hardened Properties

Property	Requirement	Test Standard
Compressive Strength (28 days)	$\geq 45$ MPa	ASTM C109
Flexural Strength	$\geq 7$ MPa	ASTM C348
Bond Strength (Adhesion)	$\geq 2$ MPa	ASTM D4541
Modulus of Elasticity	$\geq 28$ kN/mm <sup>2</sup>	BS 1881

### 5. Application Thickness

- Suitable for repair in layers up to **25 mm thickness per application**

### 6. Surface Preparation

- Remove all loose, damaged, and deteriorated concrete
- Expose reinforcement (if corroded) and clean thoroughly
- Ensure surface is:
  - Clean
  - Roughened
  - Free from dust, oil, grease
- Pre-wet substrate to **SSD (Saturated Surface Dry) condition**

### 7. Mixing

- Add clean potable water as per manufacturer recommendation (~0.16 ratio)
- Mix using mechanical mixer until homogeneous lump-free consistency is achieved
- Do not add extra water beyond specified limits

### 8. Application Procedure

- Apply mortar using:
  - Trowel or hand application
- Ensure:
  - Proper compaction
  - No air voids
- Finish surface as required
- Apply in layers if thickness exceeds recommendation

### 9. Curing

- Cure using:
  - Wet hessian cloth, or
  - Curing compound
- Minimum curing period: **7 days**

### 10. Performance Requirements

The applied mortar must:

- Provide **high bond strength**
- Exhibit **low permeability**
- Offer **corrosion resistance to embedded reinforcement**
- Maintain **dimensional stability (low shrinkage)**



## 11. Measurement

- Measured in **square meters (m<sup>2</sup>)** or **cubic meters (m<sup>3</sup>)** depending on BOQ format
- Thickness to be clearly specified

### **Item No. 74 : Providing and applying 15 mm thick mala plaster in single coat on ir side on brick / concrete wall for interior plastering in C.M. 1:3 cement: 3 coarse sand) incl. finishing with a floating coat of neat cement slurry**

The work shall be executed as per the specification of "Item No. 17.58 I. Page No. 119" of attached **Building Specification Booklet**.

Payment shall be made on Sqmt basis.

### **Item No. 75 : Distempering (Three coats) with oil bound washable distemper of approved brand and manufacture and of required shade on wall surfaces to give and even shade over and including a primer coat with alkali resistance primer of approved brand after thoroughly brushing the surface to give an even shade free from mortar droppings and other foreign matter and also including preparing the surface even and smooth for all floor etc. complete.**

#### **1.0. Materials**

**1.1.** Oil bound washable distemper and primer shall be of approved brand and manufacture. The distemper shall be of required colour and shade and the same shall conform to I.S. : 428-1969.

#### **2.0. Workmanship**

##### **2.1. Scaffolding**

Where scaffolding is required, it shall be erected in such a way that as far as possible no pail of scaffolding shall rest against the surface to be distempered. A properly secured and well tied suspended platform (Joola) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent

scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary.

##### **2.2. Preparation of surface :**

**2.2.1.** The undecorated surface to be distempered shall be thoroughly brushed from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for at least

2 months before applications of distemper.

**2.2.2.** All unnecessary nails shall be removed. Pitting in plaster shall be made good with plaster again with a fine grade sand paper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is allowed. The surface affected by moulds, moss, fungi, algae lichens, efflorescence etc. shall be treated in accordance with I.S; 2395 (Part 01) 1966. Before applying distempering, any unevenness shall be made good by applying putty made of plaster of paris mixed with water on

entire surface including filling up the undulation and then sand papering the same after it is dry.

##### **2.3. Priming coat :**

**2.3.1.** A priming coat of distemper primer of approved manufacture and shade shall be applied over the papered surface in case of new work on undecorated surface. If the distemper priming is done after the wall surface

dries completely, the distemper primer shall be applied.

**2.3.2.** Application of primer shall be done as under: The primer shall be applied with a brush on the clean dry and

smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards.

This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush

marks. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied.

**2.3.3.** Oil bound distemper is not recommended to be applied within six months of the completion of wall plaster.

##### **2.4. Preparation of oil bound distemper :**

**2.4.1.** The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the

manufacturer only. Sufficient quantity of distemper required for a day's work shall be prepared.

## **2.5. Application of Distemper coat:**

**2.5.1.** For undecorated surfaces, after the primer coat is dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out priming coat. All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of at least 24 hours between consecutive coats to permit proper drying of the preceding coat. The finished surface shall be even and uniform without patches, brush marks, distemper drops etc.

**2.5.2.** Sufficient quantity of distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot be completed on the same day.

**2.5.3.** 15 cm. double bristled distemper brush shall be used. After day's work brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

**2.6.** Protective measurements : The surfaces of doors, windows, floors, articles of furniture etc. and such other parts of the buildings as are not to be distempered shall be protected from being splashed upon. Such surfaces shall be cleaned of distemper splashes if any.

## **3.0. Mode of measurements and payment**

**3.1.** Priming coat of distemper primer, scraping of surface spoiled by struck roots, removal of oil and grease spots, treatment for infestation of efflorescences, mould moss, fungi, algae and lichen and patch repairs to plaster shall

be included in this item for which nothing extra shall be paid.

**3.2.** All the work shall be measured net in the decimal system as in place subject to the following limits unless otherwise stated hereinafter:

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 sq. m. All work shall be made for ends of joints, beams, posts etc., and openings, not exceeding 0.5 sq.m. each and no addition shall be made for reveals,

jambes, soffits, sills etc. of these openings not for finish around ends of joints, beams, posts etc.

**3.3.** Deductions of opening exceeding 0.5 sq.m. but not exceeding 3 sq. m. each shall be made as follows and net addition shall be made for reveals, jambes, soffits etc. of these openings :

(a) When both the faces of wall are provided with same finish, deductions shall be made for one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveals is less than that of the other side but no deduction shall be made on

the other side. Where the width of reveals on both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more

than that on untreated side neither deductions nor additions to be made for reveals, jambes, soffits, sills etc.

**3.4.** In case of opening of area exceeding 3 sq. m. each deduction shall be made for openings but jambes, sills and soffits shall be measured.

**3.5.** No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.

**3.6.** Item includes removing nails, making good holes, patches with materials similar in composition of distemper.

**3.7.** The rate includes cost of all materials, labours, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handling, unloading, storing work etc

**2.8. The rate shall be for a unit of one sq. meter.**

**Item No. 76 : Providing laying and jointing in true line and level 15mm dia U.P. V.C. Pipe (SCH- 40) for cold water including fittings make or equivalent as approved by Engineer In Charge. Pipe shall be fixed on the help of clamp at every two meter C / C or shall be Concelled as directed in including necessary Fitting etc. including testing of pipe and joints and fixing the same with adhesiv solvent, including cost of all materials**

The work shall be executed as per the specification of "Item No. 23.8 Page No. 162 (15 mm dia. shall be used)" of Building Specification Booklet.

Payment shall be made on Rmt basis.

**Item No. 77 : Providing laying and jointing in true line and level 25mm dia. U.P.V.C. Pipe ( SCH- 40) for cold water including fittings as approved by Engineer In Charge. Pipe shall be fixed on the wall with the help of clamp at every two metre C/C or shall be cancelled as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials. [B] 25mm dia.**

The work shall be executed as per the specification of "Item No. 23.8 Page No. 162 (25 mm dia. shall be used)" of Building Specification Booklet.

Payment shall be made on Rmt basis.

**Item No. 78 : Providing and fixing to wall ceiling and floor 10.0 Kg. F/Cm2 working pressure polythene pipes of the following outside Dia. Low densidy, complete with special falnge compression type fittings, wall clipsetc. including making good the wall ceiling and floor.(F) 75mm**

The work shall be executed as per the specification of "Item No. 23.8, Page No. 173" of Building Specification Booklet.

Payment shall be made on Rmt basis.

**Item No. 79 : Providing, laying and jointing in true line and level 110 diametre U.P.V.C (Type B) conforming to IS 13592-1992 with one end plain and other end socketed with rubber ring, & fittings conforming to ISI 14735-1999 of approved make for drainage system pipe line, pipe shall be jointed with each other with rubber lubricant, pipe shall be fixed on wall using of PVC clamp of the size 110 mm diametre x 149 mm length x 145 mm heigh at every 2000 mm center to center or shall be concealed in walls as directed including necessary fittings such as bends, shoes etc. including testing of pipes and joints and jointed with adhesive solvent cement including cost of all materials.**

The work shall be executed as per the specification of "Item No. 28.8 (II) Page No. 162 (75 mm dia. U.P.V.C (Type B) pipe shall be used)" of Building Specification Booklet.

Payment shall be made on Rmt basis.

**Item No. 80 : Providing and laying Ceramic tiles 6mm thick in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand ) finishing with flush pointing in white cement. ( up to 10 ton )**

The work shall be executed as per the specification of "Item No. 14.29 Page No. 96( shall be used)" of Building Specification Booklet.

The rate shall be for a unit of one sq. meter.

**Item No. 81 : Providing and laying coloured glazed tiles of the size 300 mm x 200 mm x 8 mm / 300 mm x 450 mm x 8 mm in skirting, risers of steps and dado on 10 mm. thick cement plaster 1:3 (1 cement : 3 coarse sand) & jointed with white cement slurry.**

**Specification: Providing and Laying Coloured Glazed Tiles**

**1. Scope of Work**

Providing and fixing **coloured glazed ceramic tiles** in:

- Skirting
- Risers of steps
- Dado (wall cladding)

including surface preparation, bedding, jointing, finishing, and curing.

**2. Materials**

**Tiles**

- Type: **Coloured glazed ceramic tiles**
- Sizes:
  - 300 mm × 200 mm × 8 mm
  - 300 mm × 450 mm × 8 mm
- Tiles shall be:
  - Uniform in size and thickness
  - Free from cracks, chips, or defects
  - Of approved colour, shade, and make

**Mortar Bedding**

- Thickness: **10 mm**
- Mix: **1:3 (1 cement : 3 coarse sand)**
- Sand shall be clean, well-graded, and free from impurities

**Jointing Material**

- **White cement slurry**
- Shade to match tile colour (if required)

**3. Surface Preparation**

- Substrate shall be:
  - Clean and free from dust, oil, grease
  - Even and properly cured
- Background surface to be **roughened** for proper bond
- Surface shall be wetted before application <sup>108</sup>

#### 4. Laying Procedure

- Apply **10 mm thick cement mortar (1:3)** as bedding
- Tiles shall be:
  - Soaked in water (if required) before laying
  - Properly aligned both vertically and horizontally
- Tiles shall be pressed firmly into the mortar bed
- Ensure:
  - Full contact without voids
  - Proper line, level, and plumb

#### 5. Jointing

- Joints shall be:
  - Uniform (typically 2–3 mm unless specified otherwise)
- Fill joints with **white cement slurry**
- Clean excess slurry immediately after filling

#### 6. Finishing

- Surface shall be:
  - Even and true to line and level
  - Free from lippage (uneven tile edges)
- Tiles shall be cleaned with a damp cloth after setting

#### 7. Curing

- Curing shall be done for **minimum 7 days**
- Keep surface moist to ensure proper bonding

#### 8. Measurement

- Measured in **square meters (m<sup>2</sup>)**
- Rate shall include:
  - Cost of tiles
  - Mortar bedding
  - Labour
  - Jointing and finishing

**Item No. 82 : Providing and fixing machine Cut , Free edge. machin polishec Granite stone slab 18 mm thick (single piece not more than 15 Doors/Windows sill and Jambs, staircase tread and risers cladding etc. as per design including edge polish of a edges of granite stone and laid on 20 mm thick cement mortar 1:6 (1 cement:6 coarse sand) jointed with grey cement slurry including rubbing and polishing finishing etc Complete.**

**1.0. Materials**

Water shall conform to M-1 Cement mortar shall conform to M-11 White glazed tiles shall conform to M-55

**2.0. Workmanship**

**2.1. Preparation of Surface:**

In case of brick masonry wall, the joints shall be raked out to a depth of least 15 mm. while the masonry is being laid. In case of concrete wall the surface shall be chiseled and roughed with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

**2.2. Laying ;**

2.2.1. The wall surface shall be covered with 10 mm. thick plaster of cement mortar 1:3 mix and allowed to harden. The plaster shall be roughened with wire brushes both way. The back of tiles shall be floated with grey cement slurry set and edges with white cement slurry in bedding mortar. The tiles shall be gently tapped in position on after the other keeping the joints as thin as possible. Top of skirting or dedo shall be truly horizontal and the joints vertical or as per required pattern.

2.2.2. Risers of steps, skirting and dedo shall rest on top of treads or flooring. Where full size tiles cannot be fixed, They shall be cut to the required size and the edges be smoothened.

2.2.3. The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

**3.0. Mode of measurements and payment**

3.1. The rate shall include the cost of all materials and labour required for various operations described above. Risers of steps: skirting and dedo shall be measured in square meters, length and height shall be measured along the finished face of the skirting or dedo including curves, where special such as covers. internal and external angles, etc., used. The length and height shall be measured correct to the centimetre except in case of risers and skirting where height shall be measured correct to 3 mm

3.2. The rate shall be for a unit of one sq. meter.

**Item No. 83 : Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C member including stacking of serviceable material and disposal of unserviceable from site of work with all lead and lift.**

**1.0. Workmanship**

1.1. The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings.

1.2. The demolition shall always be planned before hand shall be done in reverse order to the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work.

This however will not absolve the contractor from the responsibility of proper and safe demolition.

1.3. Necessary propping, shoring and under pinning shall be provided for the safety of the adjoining work or

property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in

such a way that no damage is caused to the adjoining property.

**1.4.** Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be

taken to keep the dust nuisance down as and where necessary.

**1.5.** Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles

shall be properly stacked as directed.

**1.6.** All materials obtained from demolition shall be the property of Government unless otherwise specified and

shall be kept in safe custody until handed over to the Engineer-in-charge.

**1.7.** Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked

properly as directed with all lead and lift. All unserviceable materials, rubbish etc., shall be stacked as directed' by the

Engineer-in-charge.

**1.8.** On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed.

## **2.0. Mode of measurements and payment**

**2.1.** Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item.

Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work,

**2.2.** All work shall be measured in decimal system as fixed in its place subject to the following limits; unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Area shall be worked out

to the nearest 0.01 sq. mt.(c) Cubical contents shall be worked out to the nearest 0.01 Cu.m.

**2.3.** The rate shall include cost of all labour involved and tools used in demolishing and dismantling including

scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly

and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the

safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or

portions where considered necessary.

**2.4.** The rate shall be for a unit of one Sq.Mt.

**Item No. 84 : Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats architraves, holdfasts and other attachment etc. complete and stacking them within all lead and lift.(ii) Exceeding 3 Sq.M. in area.**

The work shall be executed as per the specification of "Item No. 20.49.(i) Page No. 150" of attached **Building Specification Booklet.**

Payment shall be made on **Each** basis.

**Item No. 85 : Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg./Sq.m. in foundation and plinth in cement mortar 1:6 (1 cement:6 fine sand) (b) Conventional.**

**1.0. Materials**

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Brick shall conform to M-15.

Cement mortar shall conform to M-11.

**2.0. Workmanship**

**2.1. Proportion:**

**2.1.1.** The proportion of the cement mortar shall be 1:5 (1 cement: 5 fine sand) by volume.

**2.2. Wetting of bricks:**

**2.2.1.** The bricks required for masonry shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water is as indication of through wetting of bricks.

**2.3. Laying:**

**2.3.1.** Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond; closures in such case shall be cut to required size and used near the ends of walls.

**2.3.2.** A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

**2.3.3.** The walls shall be taken up truly in plumb. All courses shall be laid truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept uniform.

**2.3.4.** The brick shall be laid with frog up wards. A set of tools comprising of wooden straight edges, man son's spirit level, square half meter rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

**2.3.5.** Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one meter over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

**2.3.6.** All futures, pipes, outlets of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar

**2.4. Joints:**

**2.4.1.** Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exposed 12 mm.

The face joints shall be raked out as directed by raking tools daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

**2.4.2.** The face of brick shall be cleaned the very day on which the work is laid and all mortar dropping removed.

**2.5. Curing:**

**2.5.1.** Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well wetted at the close of the day.

**2.6. Preparation of foundation bed:**

**2.6.1.** If the foundation is to be laid directly on the excavated bed, the shall be leveled, cleared of all loose materials, cleaned and wetted before stating masonry, If masonry is to be laid on concrete footing, the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed before foundation

masonry is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.



### **3.0. Mode measurements & payment**

**3.1.** The measurements of this item shall be taken for the brick masonry fully completed in foundation up to plinth.

The limiting dimensions not exceeding those shown on the plinths or as directed shall be final. Battered tapered and curved portions shall be measured net.

**3.2.** No deduction shall be made from the quantity of brick work, for any extra payment made for embedding in masonry or making holes in respect of following items:

- (1) Ends of joists, beams, posts, girders, purlins, trusses, corbel, steps etc. where cross sectional area does not exceed 500 Sq.Cm.
- (2) Openings not exceeding 1000 Sq.Cm.
- (3) Wall plates and bed plates, bearing of slabs, chajjas and the like whose thickness does not exceed 10 Cms. and the bearing does not extend to the full thickness of wall.
- (4) Drainage holes, and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
- (5) Iron fixtures, pipes up to 300 mm. dia hold fasts, and doors and windows built into masonry and pipes etc. for concealed wiring.
- (6) Forming chases of section not exceeding 350 -Sq. Cm. in masonry.

**3.3.** Apertures for fire places shall not be deducted nor shall be paid for separately.

**3.4. The rate shall be for a unit of one cubic meter.**

### **Item No. 86 : Providing 15mm thick cement plaster in single coat on Rough (Similar)side of single or half brick walls for interior plastering upto floor two level and finished even and smooth in (i) Cement mortar 1:3 (1-cement:3-sand)**

#### **1.0. Materials**

**1.1.** Water shall conform to M-1. The cement mortar of proportion 1:3 shall conform to M-13.

#### **2.0. Workmanship**

##### **2.1. Scaffolding:**

Wooden bullies, bamboos, planks, trestles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

##### **2.2. Preparation of back-ground :**

**2.2.1.** The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be toughened by wire brushing if it is not hard and by

hacking if it is hard. In case of concrete surface, if a chemical retarded has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the readers if left on the surface. Trimming of projections on brick/concrete surfaces where necessary shall be carried out to get an even surface.

**2.2.2.** Raking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before

carrying out the plaster work.

**2.2.3.** The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such area shall be moistened again.

**2.2.4.** For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be-started wherever the building frame and cladding work are ready

and the temporary supports of the ceiling resting on the wall of the floor have been removed. Ceiling plaster shall

be completed before starting plaster to walls.

##### **2.3. Application of plaster:**

**2.3.1.** The plaster about 15x15 cms. shall be first applied horizontally and vertically at not more than 2 meters intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small

upward and sideways movements at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a smooth or a sandy granular texture is required Excessive troweling or overworking

the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Hounding or chamfering, corners, arises junctions etc. shall be carried out

with proper templates to be size required.

**2.3.2.** Cement plaster shall be used within half an hour after addition of water. And mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

**2.3.3.** In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically, when recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together.

Plastering

work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises.

It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

**2.3.4.** Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only

as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of

building in hot air or dry weather shall be prevented by hanging matting or gunny bags on the outside of the plaster

and keeping them wet.

### **3.0. Mode of measurements & payment**

**3.1.** The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

**3.2.** All plastering shall be measured in square meters unless otherwise specified. Length breadth or height shall be measured correct to a centimetre.

**3.3.** Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.

**3.4.** This item includes plastering up to floor two level.

**3.5.** The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices

if any shall be deducted.

**3.6.** Soffits of stairs shall be measured as plastering on ceilings, following soffits shall be measured separately.

**3.7.** For jambs, soffits, sills etc. for openings not exceeding 0.5 sq. met each in area for ends of joints beams, posts, girders, steps etc. not exceeding 0.5 sq. mt each in area and for openings exceeding 0.5. sq. mt and not exceeding 3.00 sq. mt. in each area deductions and additions shall be made in the following manners.

(a) No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq. mt each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, for finish to plaster around ends of joints, beams posts etc.

(b) Deduction for openings exceeding 0.5 sq. mt but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, (i) When both faces of all wall are

plastered with same plaster, deduction shall be made for one face only, (ii) When two faces of wall are plastered with different types of plasters or if one face is plastered and the other pointed, deductions shall be made from the

plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other

side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and / or pointing as the case may be.

**3.8.** For openings having door frames equal to or projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.

**3.9.** In case of openings of area above 3 sq. mt. each, deduction shall be made for openings but jambs, soffits and sills shall be measured.

**3.10.** The rate shall be for a unit of One sq. meter

**Item No. 87 : Providing and laying Mirror polished Machine polished Granite stone slab 18mm (Average ) thick for doors & windows sill & Jams clading as per design including full moulded round front steps & 1cm nosing & necessary groove on trades of steps ;laid on 20mm thick cement mortar 1:6 ( 1 cement : 6 coarse sand ) jointed with gray cement slurry including rubbing and polsihing etc. complete.for Doors / windows sill & jams clading.**

**1.0. Materials**

Water shall conform to M-1 Cement mortar shall conform to.M-11 White glazed tiles shall conform to M-55

**2.0. Workmanship**

**2.1. Preparation of Surface:**

In case of brick masonry wall, the joints shall be raked out to a depth of least 15 mm. while the masonry is being laid. In case of concrete wall the surface shall be chiseled and roughed with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

**2.2. Laying ;**

2.2.1. The wall surface shall be covered with 10 mm. thick plaster of cement mortar 1:3 mix and allowed to harden. The plaster shall be roughened with wire brushes both way. The back of tiles shall be floated with grey cement slurry set and edges with white cement slurry in bedding mortar. The tiles shall be gently tapped in position on after the other keeping the joints as thin as possible. Top of skirting or dedo shall be truly horizontal and the joints vertical or as per required pattern.

2.2.2. Risers of steps, skirting and dedo shall rest on top of treads or flooring. Where full size tiles cannot be fixed, They shall be cut to the required size and the edges be smoothened.

2.2.3. The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

**3.0. Mode of measurements and payment**

3.1. The rate shall include the cost of all materials and labour required for various operations described above. Risers of steps: skirting and dedo shall be measured in square meters, length and height shall be measured along the finished face of the skirting or dedo including curves, where special such as covers. internal and external angles, etc., used. The length and height shall be measured correct lo the centimetre except in case of risers and skirting where height shall be measured correct to 3 mm

3.2. The rate shall be for a unit of one sq. meter.

**Item No. 88 : Wall painting with Applying two coats of putty & two coats of primer of approved brand (three coats) plastic emulsion paint with one wall in every to highlight in special effect (royal play) color shade and color of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.**

**1.0. Materials**

Water shall be conforming M-1. The plastic emulsion shall conform to I.S.: 5411-1969 (part-I).

**2.0. Workmanship**

2.1. Scaffolding: The relevant specifications of item-No. 18.11 Para 2.1 shall be followed.

2.2. Preparation of surface: The relevant specification of item No. 18.44 Para 2.2 shall be followed.

**2.3. Preparation of Mix :**

This shall be done as per manufacturer's instructions. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added shall be as per manufacturer instructions.

**2.4. Application:**

2.4.1. Before pouring into small containers for use, the paint shall be stirred thoroughly in item container. When applying also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

2.4.2. The paint shall be laid on evenly and smoothly by means of crossing and laying off the crossing and consist of covering the area over with paint, brushing the surface hard for the first time over and then, brushing alternately in opposite direction two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush Marks shall be left after the laying off is finished. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of moldings, etc. shall be left on the work. The full process of crossing and laying off will constitute one coat.

2.4.3. The paint shall be applied with brush or rollers. For undecorated surfaces, the surface shall be treated with minimum two coats of cement water proofing paint. The second or subsequent coat shall not be started until the proceeding coat as become sufficiently hard to resist marking by brushing being used.

2.4.4. The surface on finishing shall present a flat velvety smooth finish. It shall be even and uniform in shade without patches, brush marks, paint drops etc.

**.5. Precautions:**

(a) Old brushes if they are to be used with emulsion paints, shall be completely dried of turpentine or oil paint by washing in warm soap water. Brushes shall be quickly washed in water immediately after use and kept immersed in water fusing break periods to prevent the paint from hardening on the brush.

(b) In the preparation of wall for plastic emulsion painting, no oil base petals shall be sued in filling cracks, holes etc.

(c) Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

(d) Washing or surfaces treated with emulsion paint shall not be done within 3 to 4 weeks of application

2.6. Protective payment: The relevant specifications of item No. 18.11 shall be followed.

**3.0. Mode of measurements and payment**

3.1. The relevant specifications of item No. 18.11 shall be followed.

**3.2. The rate shall be for a unit of One sq. meter.**

**Item No. 89 : Providing and laying Vitrified tiles 8 to 10 mm thick , 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement :3-coarse sand ) finishing with flush pointing in white cement.**

Specification – Providing and Laying Vitrified Floor Tiles

Providing and laying **vitrified tiles** of **8–10 mm thickness**, size of approved make and shade, , **24" x 24"** in **flooring, treads of steps, and landings**.

Tiles shall be laid over a **12 mm thick cement mortar bed** in the proportion **1:3 (1 cement : 3 coarse sand)**, properly mixed and spread to true levels and slopes.

Joints shall be kept uniform and finished with **flush pointing using white cement**, mixed with approved pigment if required. Tiles shall be properly aligned, tamped, and set to achieve an even and smooth surface.

The work shall include:

- Cutting of tiles wherever required
- Proper bedding, jointing, and finishing
- Cleaning and curing after laying

The item shall be **complete in all respects**, including all materials, labour, tools, and incidentals, as per drawings and directions of the Engineer-in-Charge.

The rate shall be for a unit of **Sqm**.

**Item No. 90 : Applying general insecticide pest control treatment to floors, cupboards etc including labour materials etc. complete. Using Imidacloprid 30.5 SCas Per IS 6313 part -II( 0.075% concentration by mass) is recommended 10.5ml chemical diluted with 5 liters of water application 0.5 litre chemical /Sqm of surface is recommended as per I.S.**

**2 Materials :**

The chemicals used for the soil treatment shall be only one of the following with concentration shown against each in aqueous emulsion.

Chemicals Concentration

1. Aldrin 0.50% (by weight)

2. Heptachlor 0.50% (by weight)

3. Chlordane 1.00% (by weight)

2.1. The chemicals barrier shall be complete and continuous under whole of the structure to be protected.

2.2. The bottom and the sides of foundations up to a height of 30 cms. from the bottom of excavation made for masonry foundation and for basement column pits shall be treated with the chemical emulsion at the rate 5 liters/ sq. meter of the surface area.

2.3. The chemical treatment shall be-carried out when the surfaces is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil wet with rain or sub soil water.

2.4. Once formed, treated soil barriers shall be not disturbed. If by chance, treated soil barriers are disturbed, immediate steps shall be taken to restore the continuing and compactness of the barrier system

2.5. The treatment against termite infection shall remain fully effective for a period not less than 10 years from date of issue of the final certificate to completion of work. If at any time during this period, any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed, the contractor shall be rectify the concerned defects within 14 days on receipt of notice from Engineer-in-charge. On contractor's failure to do so, the Engineer-in-charge may get the same rectified through any other agency at contractor's risk and cost, and decision of Engineer-in-charge as to the cost payable by contractor for the same shall be final and binding to the contractor.

2.6. A guarantee bond on appropriately stamped paper shall be given by the contractor to the department in the manner and form prescribed below:

**FORM OF GUARANTEE BOND**

I/We..... ( Contractor) hereby guarantee that work will remain unaffected and will not be any way damaged by termite or any other germs of similar types, for a period for 10 years after completion of the work of anti-termite as per the terms and conditions of the contract and or damage that might be caused on account of termite and or other similar type of germs and hereby Guarantees to make good any loss of damages suffered by the Government of Gujarat and further guarantee to redo effective work without claiming any extra cost.

2.7. This guarantee shall remain in force for the period of 10 years from the completion of the work under the

contract and it shall remain binding to the contractor for period of 10 years.

2.8. The deposit at the rate of 50% of the cost of this item from the running and final bills shall be recovered and retained for the first one year after completion of the work and 10% shall be retained for the balance of guarantee period and shall be refunded only after the completion of the guarantee period.

**3.0. Mode of measurements & payment**

3.1. The length and breadth shall be measured correct to a cm. as per the dimensions of sanctioned plans. No deduction shall be made nor extra paid for any opening for pipes etc. up to 0.1.sq. mt. The rate shall include the cost of all labour and materials required for the operation involved for satisfactory completion of this item. The sides of the trenches 30 cms, each side and bottom shall be measured under this item.

3.2. The rate shall be for a unit of One sq. meter.<sub>118</sub>

**Item No. 91 : Finishing wall with Texture Finish paint of metallic finish on wall surface (three coat) including priming coat to give an even shade / pattern and of approved brand and manufacture including all material and labour work with thoroughly brooming the surface to remove all dirt and remains of loose powdered material etc. complete.**

Specification: Textured Metallic Finish Paint on Wall Surface

Providing and applying **textured finish paint with metallic finish** on wall surfaces, consisting of **three coats**, including **one priming coat**, to achieve an even shade and uniform pattern.

The work shall include:

- Thorough **cleaning of the surface** by brooming to remove all dust, dirt, and loose powdered material.
- Proper **surface preparation** to ensure good adhesion of paint.
- Application of **approved brand and manufacture** materials.
- Application of **primer coat** followed by **two or more finishing coats** to achieve the specified textured metallic effect.
- Ensuring **uniform texture, color consistency, and pattern finish** across the surface.
- Including all **materials, tools, labor, scaffolding, and equipment** required to complete the work.

The work shall be carried out **as per standard specifications** and completed to the satisfaction of the engineer-in-charge.

#### Bill of Quantities (BOQ)

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and applying textured finish paint with <b>metallic finish</b> on wall surface in <b>three coats</b> , including <b>one coat of primer</b> , to achieve uniform shade and pattern, of approved brand and manufacture. The work includes thorough <b>surface preparation by brooming</b> , removing dust, dirt, and loose materials, complete with all materials, labour, tools, scaffolding, and equipment, as per specifications and direction of Engineer-in-Charge.	Sq.m	_____	_____	_____

#### Notes:

- **Unit:** Square Meter (Sq.m)
- **Quantity:** To be measured as per actual executed area
- **Rate:** Inclusive of all materials, labour, and surface preparation
- **Amount:** Quantity × Rate

#### Mode of measurements and payment

The rate shall be for a unit of One sq. meter.

**Item No. 92 : Providing and fixing wooden paneling made of framing the skeleton(plywood frame structure)with 18mm + 18mm thick MR grade plywood for vertical and horizontal plywood (patti) one side cover with 6mm thick MR grade plywood for grooving as per design.Fixing properly without any air gap and finishing with selected 1.00 mm thick laminate.Before installation,make hole/face plate for conduit pipes of electrical/networking cables with openable stud from partition Including all materials and labour etc.complete as per detail drawing and instruction of engineer-in charge.Wooden Pelmat Veneer**

**Specification: Wooden Paneling with Laminate Finish & Pelmet (Veneer Finish)**

Providing and fixing **wooden paneling** made from a framed skeleton (plywood frame structure) using **18 mm + 18 mm thick MR grade plywood** for vertical and horizontal members (patti framework).

One side shall be covered with **6 mm thick MR grade plywood** to form grooves as per approved design and pattern.

The work shall include:

- Proper **fixing of the framework** ensuring no air gaps between wall and paneling.
- Necessary **cut-outs and provisions for electrical and networking conduits**, including face plates and openable access panels (studs) in the partition.
- Finishing the exposed surface with **1.0 mm thick decorative laminate** of approved make and shade.
- All joints, grooves, and edges to be finished neatly as per design.
- Providing and fixing **wooden pelmet finished with veneer**, complete as per drawings.
- Including all **materials, labour, hardware, tools, and scaffolding**, complete as per instructions of the Engineer-in-Charge.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and fixing <b>wooden wall paneling</b> made of plywood frame structure using 18 mm + 18 mm thick MR grade plywood for vertical and horizontal members, covered on one side with 6 mm thick MR grade plywood for groove design, including necessary cut-outs for electrical/networking services with openable access panels, properly fixed without air gaps, and finished with 1.0 mm thick decorative laminate of approved make, including all materials, labour, tools, and complete as per drawings and direction of Engineer-in-Charge.	Sq.m	_____	_____	_____
2	Providing and fixing <b>wooden pelmet with veneer finish</b> , including all materials, polishing, labour, and complete as per design and direction of Engineer-in-Charge.				

**Mode of measurements and payment**

The rate shall be for a unit of One sq. meter.



### Item No. 93 : WOODEN PARTITION

Providing and fixing partitions, the average height of partition will be 1520 mm. The basic structure shall be made out of the Aluminium tubular/rolled section as framing, Aluminium Box Section size of 50mm x 25mm x 1.6mm thickness & at suggested intervals i.e 600 c / c fixed with each other 50MM\*25MM\*1MM thickness angle cleat proper fixity. The entire Alu. frame work shall be covered with 8 mm thickness plywood IS 310 on both the sides. All open sides of the framework shall be covered with the 12 mm thickness plywood for partitions. All the gaps either vertical or horizontal with proper material shall be filled properly. All the vertical members of the partition shall be inserted / fixed in the floor for proper strength necessary provisions shall be made in the partition for the electrical conduits / switch boards/etc. The external plywood components including the thickness of partition shall be finished with 1 MM thickness decorative laminate on both the sides. All visible exposed area of the partition covered with Indian teak wood beading where ever required. It shall have (3 coats)malamine spreay polishing finish. The quoting price should be inclusive of all types of taxes & duties ,packing, forwarding, loading, unloading, installaion. As per detail drawing & choice of users department and Concern officers in charge as directed by the Architect / Engineer.

#### **Specification: Wooden Partition (Laminate Finish with Aluminium Framework)**

Providing and fixing **wooden partitions** of average height **1520 mm**, consisting of an **aluminium framework** made from tubular/rolled sections.

The work shall include:

- Framework using **aluminium box sections of size 50 mm × 25 mm × 1.6 mm thickness**, placed at **600 mm c/c intervals**, properly fixed with **50 mm × 25 mm × 1 mm thick angle cleats** for rigidity.
- All vertical members to be **securely fixed into the floor** to ensure stability and strength.
- Covering both sides of the aluminium framework with **8 mm thick plywood (IS 303/IS 710 equivalent to IS 310 as specified)**.
- All exposed/open edges to be finished with **12 mm thick plywood**.
- Filling of all vertical and horizontal gaps with suitable material for a smooth and uniform surface.
- Providing necessary **cut-outs and provisions for electrical conduits, switchboards, and services** within the partition.
- Finishing both sides with **1.0 mm thick decorative laminate** of approved make and shade.
- All visible exposed edges to be finished with **Indian teak wood beading**, neatly fixed.
- Final surface finishing with **3 coats of melamine spray polish** for smooth appearance.
- Including all **materials, labour, fittings, taxes, packing, transportation, loading/unloading, and installation**, complete as per drawings and instructions of Architect/Engineer-in-Charge.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and fixing <b>wooden partition (1520 mm height)</b> with aluminium framework of 50×25 mm box section (1.6 mm thick) at 600 mm c/c, fixed with angle cleats, covered on both sides with 8 mm thick plywood and edges with 12 mm plywood, including filling gaps, providing provisions for electrical services, fixing vertical members into floor, finished with 1.0 mm decorative laminate on both sides, with Indian teak wood beading on exposed edges and 3 coats melamine spray polish, including all materials, labour, taxes, transport, loading/unloading and complete as per drawings and direction of Engineer-in-Charge.	Sq.m	_____	_____	_____

**Notes:**

- **Unit:** Square Meter (Sq.m)
- Height considered: **1520 mm (1.52 m)**
- Rate to include **complete finished partition work**
- Measurement shall be based on **actual executed surface area**
- All work to comply with **approved drawings and specifications**
- **Mode of measurements and payment**
- The rate shall be for a unit of One sq. meter.

**Item No. 94 : Repairing to Door / Window including dissembling from frame, wroughting, providing patti, angles, replacing / repairing stoppers - aldrops - handles etc. for proper fixing in to frame hole etc. complete for smooth operation and proper utilization including assambeling and refixing of the same as directed by Engineer-in-charge.**

### **1. Scope of Work**

This specification covers the **repair, disassembly, reassembly, and painting** of **wooden doors/windows**, including replacement of defective parts and ensuring smooth operation.

### **2. Work Details**

#### **A. Disassembly & Inspection**

1. Carefully **dismantle the door/window from the frame** without causing damage.
2. Inspect for **damaged, worn-out, or misaligned components** such as hinges, handles, stoppers, AL drops, etc.
3. Identify any **woodwork issues** such as cracks, warping, or termite damage.

#### **B. Repair & Replacement**

4. **Roughing (reshaping/smoothing) the wooden surface** where necessary.
5. **Providing & fixing Patti, angles, or reinforcements** to strengthen the structure.
6. **Replacing or repairing defective hardware** such as:
  - o **Hinges, handles, stoppers, AL drops, latches, locks.**
  - o Adjusting for proper alignment and smooth movement.
7. **Ensuring a proper fit** into the frame hole for smooth operation.

#### **C. Reassembly & Fixing**

8. **Assemble and refax the door/window back into the frame.**
9. Check for **proper alignment and ease of operation** (opening/closing smoothly).

#### **D. Painting & Finishing**

10. **Cleaning the surface** thoroughly, removing dust, dirt, and old flakes.
11. **Applying one coat of enamel paint** over the previously painted surface:
  - o Ensuring **an even shade** without streaks.
  - o **Excluding primer coat** (if already primed).
12. **Final inspection** to ensure smooth operation and aesthetic finish.

### **3. Materials & Tools Required**

- **Patti, angles, screws, nails, adhesives** for reinforcements.
- **Hardware fittings:** Hinges, handles, stoppers, AL drops, locks.
- **Enamel paint (approved brand & shade)** for uniform finish.
- **Sandpaper, wire brush, putty** for surface preparation.
- **Paintbrushes/rollers** for smooth application.

### **4. Measurement & Payment**

Payment shall be made on **Sqm** basis.

**Item No. 95 : Both side laminate finish flush door.** Providing Material & Labour charge for making laminate finish Flush Door (finished size of door is 40 mm) of size 975 mm x 2400 mm considering waterproof flush door sheet of 38 mm thickness covered both side by 1.0 mm thick Laminate supported by SS -314 finish hinges. All exposed framing of 65 mm x12 mm made by teak wood bidding complete with polish. Finishing with all necessary hardwares like handles, conceal mortise locks, cylinders with 6 nos of keys, stoppers, tower bolt, MS nails, SS-314 screws etc. as per details given in drawing and as per instructions of Architect/Engineer In charge. Please see the Attached Make List for Approved Makes.

Specification: Both Side Laminate Finish Flush Door

Providing and fixing **flush door shutters** of finished thickness **40 mm** and size **975 mm × 2400 mm**, made from **38 mm thick waterproof flush door core**, finished on both sides with **1.0 mm thick decorative laminate** of approved make and shade.

The work shall include:

Proper bonding of laminate on both sides with uniform finish.

Fixing the shutter with **SS-304 grade hinges** of approved make.

All exposed edges to be finished with **teak wood beading of size 65 mm × 12 mm**, neatly polished.

Providing and fixing all necessary **door hardware**, including:

Handles

Concealed mortise lock

Cylinder with **6 keys**

Door stoppers

Tower bolts

SS-304 screws and MS nails

Complete **polishing of wooden beading** for a smooth finish.

Including all **materials, labour, fittings, fixing, and installation**, complete as per drawings and instructions of Architect/Engineer-in-Charge.

Work to be executed using **approved makes** as per attached make list.

BOQ (Bill of Quantities)

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and fixing <b>both side laminate finish flush door shutter</b> of size 975 mm × 2400 mm and 40 mm thickness, made from 38 mm thick waterproof flush door core, finished with 1.0 mm thick decorative laminate on both sides, including teak wood beading (65×12 mm) on exposed edges with polish, fixed with SS-304 hinges, and including all necessary hardware fittings such as handles, concealed mortise lock, cylinder with 6 keys, tower bolts, door stoppers, screws, nails, etc., complete as per drawings and direction of Engineer-in-Charge.	Each	_____	_____	_____

Notes:

**Unit:** Each (per door)

**Rate:** Inclusive of door shutter, laminate, hardware, polishing, and installation

Door frame (if any) is **not included** unless specified separately

All materials shall be of **approved makes**

Measurements shall be as per **finished installed size**

- **Mode of measurements and payment**

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- The rate shall be for a unit of One sq. meter.

**Item No. 96 : Providing and supplying Medium back chair for conference with M.S frame work. Upholstered with changeable fabric upholstery covers (as per requirement) and molded PU foam, together with molded seat & back covers. The back foam should be designed with contoured lumbar support for extra comfort. Caster of high durability & hydraulic. The chair should have cylinder with 5 years warranty. The size of chair 47.5cm x 58cm (Back side) and 49cm x 48cm (seat size). The PU foam should be molded with density = $45 \pm 2$  kg/m<sup>3</sup> .with One piece armrests. The armrests are scratch and weather resistant. The permanent contact mechanisms is designed with 360° revolving type, with pneumatic height adjustment & 17 ° maximum tilt only & tilt tension adjustment facility. complete as per sample approved and as directed by the Architect and approved by the Engineer in Charge**

**Specification: Medium Back Conference Chair**

Providing and supplying **medium back conference chair** with **M.S. (mild steel) framework**, ergonomically designed for comfort and durability.

The work shall include:

- Upholstery with **changeable fabric covers** (as per requirement and approved sample).
- Seat and back made of **molded PU foam** with density  $45 \pm 2$  kg/m<sup>3</sup>.
- Backrest designed with **contoured lumbar support** for enhanced comfort.
- **Molded seat and back covers** for durability and finish.
- **One-piece armrests**, scratch-resistant and weather-resistant.
- **360° घूमने वाला (revolving) mechanism** with:
  - Pneumatic height adjustment
  - Maximum **17° tilt**
  - Tilt tension adjustment facility
- **Heavy-duty castors (wheels)** for smooth mobility.
- **Hydraulic system (gas lift cylinder)** with **minimum 5-year warranty**.
- Chair dimensions:
  - Back size: **47.5 cm × 58 cm**
  - Seat size: **49 cm × 48 cm**
- Complete in all respects including **materials, labour, assembly, and delivery**, as per approved sample and instructions of Architect/Engineer-in-Charge.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and supplying <b>medium back conference chair</b> with M.S. frame, molded PU foam (density $45 \pm 2$ kg/m <sup>3</sup> ), contoured lumbar support, changeable fabric upholstery, one-piece armrests, 360° revolving mechanism with pneumatic height adjustment and tilt facility, heavy-duty castors, hydraulic cylinder with 5-year warranty, complete as per approved sample and direction of Engineer-in-Charge.	Each	_____	_____	_____

## Notes:

- **Unit:** Each
- **Rate:** Inclusive of supply, transportation, and installation (if required)
- Chair to be approved based on **sample before bulk supply**
- Warranty certificate for **hydraulic cylinder** must be provided
- Make/brand to follow **approved vendor list (if applicable)**
- **Mode of measurements and payment**
- The rate shall be for a unit of One Nos.

**Item No. 97 : Providing And Arranging table for chamber having overall thickness of Top 40 mm (18+18+4mm) 18 mm thick MR Grade plywood and 4.00 mm thick veneer at top with melamine polish finish including 8mm thick back painted glass. Top to be made from 75mm x 50 mm Indian teak wood with half round moulded on long side with melamine polish. Leg 50 mm x 50 mm x 1.6 mm thick CRCA Square pipe and supporting pipe 50 mm x 25mm x 1.8 mm finishing with epoxy powder coated 50 micron with leveller. Apron having 18 mm thick MR Grade plywood with 4.00 mm thick veneer having melamine polish finish. Drawer Unit- 450 x 550 x 600 mm having all Structure 18 mm thick MR grade plywood with veneer and teakwood border of specified size with melamine polish finish. Drawers (3 Nos) slides on Ebco make telescopic channel with Godrej make lock with two keys and necessary fixtures and fastening as approved with balancing laminate inside 0.8 mm thick of approved shade including all materials and labour etc. Complete as per drawing and instruction of engineer-in charge. Side Unit to be provided saparetly. Judge Table with MDU veneer Size :- 1800mm x 900mm x 750mm**

### **Specification: Chamber Table / Judge Table with Veneer Finish**

Providing and arranging **chamber table (Judge Table)** of size **1800 mm × 900 mm × 750 mm**, constructed with premium materials and finished with veneer and melamine polish.

The work shall include:

#### Table Top:

- Overall thickness **40 mm** made from **18 mm + 18 mm MR Grade plywood + 4 mm veneer** on top.
- Finished with **melamine polish** for smooth surface.
- Providing **8 mm thick back-painted glass** on top (where specified).
- Edges finished with **75 mm × 50 mm Indian teak wood section** with half-round moulding and melamine polish.

#### Table Frame / Legs:

- Legs made from **50 mm × 50 mm × 1.6 mm thick CRCA square pipe**.
- Supporting members using **50 mm × 25 mm × 1.8 mm thick CRCA pipe**.
- Finished with **epoxy powder coating (minimum 50 microns thickness)**.
- Including **adjustable levellers**.

#### Apron:

- Made from **18 mm thick MR Grade plywood** with **4 mm veneer finish** and melamine polish.

#### Drawer Unit (Size: 450 × 550 × 600 mm):

- Structure made from **18 mm MR Grade plywood** with veneer finish.
- Finished with **teak wood borders** and melamine polish.
- Providing **3 drawers** with:
  - **Telescopic channels (Ebco make)**
  - **Godrej make lock** with 2 keys
  - Internal surface finished with **0.8 mm balancing laminate**
- Including all necessary fittings and hardware.

#### General:

- All materials, labour, fittings, fixtures, and installation included.
- Work to be executed as per **approved drawings and instructions of Engineer-in-Charge**.
- **Side unit to be provided separately** (not included in this item).

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#### BOQ (Bill of Quantities)

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and arranging <b>chamber/judge table</b> of size 1800×900×750 mm with 40 mm thick top (18+18 mm MR plywood + 4 mm veneer) finished with melamine polish, including 8 mm back painted glass, teak wood moulded edge, CRCA steel frame with epoxy powder coating, apron with veneer finish, and complete drawer unit (3 drawers with telescopic channels and locking system), including all materials, labour, fittings and fixtures, complete as per drawings and direction of Engineer-in-Charge.	Each	_____	_____	_____

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#### Notes:

- **Unit:** Each
- **Rate:** Inclusive of table, drawer unit, hardware, polishing, and installation
- **Side unit:** To be measured and paid separately
- All materials must be of **approved make (Ebco, Godrej, etc.)**
- Finish to match **approved sample**
- **Mode of measurements and payment**
- The rate shall be for a unit of One Nos.

**Item No. 98 : Providing and supply The chair pipe structure of MS CRCA finish 16 gauge round pipe having a diameter of 32 mm, the understructure frame tubular structure with stability for proper balance, the seat and back is supported on spring structure, the backrest armrest and seat dimensioned and curved from an ergonomics point of view, the frame and spring-seat structure prepared from MIG welding process & powder coated, proper high-density rubber bush provided at all four legs, seat & back upholstered with fabric.**

**Specification: Fabric Upholstered MS Chair (Visitor/General Purpose Chair)**

Providing and supplying **fabric upholstered chair** with **M.S. CRCA pipe structure**, designed for durability and ergonomic comfort.

The work shall include:

- Frame made from **16 gauge MS CRCA round pipe of 32 mm diameter**.
- Properly designed **tubular understructure** to ensure stability and balance.
- Seat and back supported on **spring structure** for enhanced comfort.
- Ergonomically designed **seat, backrest, and armrest** with appropriate curvature.
- Complete frame and spring structure fabricated using **MIG welding process**.
- Frame finished with **powder coating** for durability and corrosion resistance.
- Providing **high-density rubber bushes** at all four legs to prevent slipping and floor damage.
- Seat and back upholstered with **approved quality fabric**.
- Including all **materials, labour, fabrication, finishing, and delivery**, complete as per approved sample and instructions of Engineer-in-Charge.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and supplying <b>fabric upholstered MS chair</b> made from 16 gauge CRCA round pipe (32 mm dia), with tubular frame, spring-supported seat and back, ergonomically designed backrest and armrest, MIG welded and powder coated finish, fitted with rubber bushes, complete with fabric upholstery, including all materials, labour, and delivery, as per approved sample and direction of Engineer-in-Charge.	Each	_____	_____	_____

**Notes:**

- **Unit:** Each
- **Rate:** Inclusive of fabrication, upholstery, and transportation
- Chair shall be approved based on **sample before supply**
- Powder coating thickness and finish to match **approved specification**
- Fabric shade and quality to be **approved by Architect/Engineer**
- **Mode of measurements and payment**
- The rate shall be for a unit of One Nos.



**Item No. 99 : Zebra Roller blinds-CURTAIN :-** Blinds assemblies are to be supplied & installed in all windows with great precision. It should be water resistant and fitted on aluminium headrails duly powder coated and fitted with stainless steel drive rods. Manual operated and should have ISI mark. Providing & fixing roller type window curtains of Deck, Aerolux, Siddhi or eq. make including same brand channel - chain mechanism, synthetic black out fabric of approved colour & design, silver coated backside, same fabric plated pelmet etc. with all necessary fittings etc. complete as per Architect/ Site engineer's instructions as per sized specified in detail drawings. Material selection should be as per engineer in charge and chief architect.

**Specification: Zebra Roller Blinds / Curtains**

Providing, supplying, and installing **Zebra roller blinds** for all windows, ensuring precision, durability, and aesthetics.

The work shall include:

- **Blinds assemblies** to be mounted on **aluminium headrails**, duly **powder coated** for corrosion resistance.
- **Manual operation** with stainless steel drive rods.
- Fabric should be **water-resistant**, synthetic black-out, with **silver-coated backside**, and approved colour/design.
- Provision of **matching pelmet** of same fabric, neatly plated.
- **Chain/roller mechanism** from approved brands (Deck, Aerolux, Siddhi, or equivalent).
- All necessary **fittings, fixtures, and hardware** to complete the installation.
- Work to conform to **approved ISI standards**.
- Installation and material selection as per instructions of **Architect / Engineer-in-Charge** and detailed drawings.
- Complete in all respects including **labour, tools, and materials**.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing, supplying, and fixing <b>Zebra roller blinds</b> with aluminium powder-coated headrails, stainless steel drive rods, manual operation, synthetic black-out fabric with silver-coated back, matching pelmet, approved brand mechanism (Deck / Aerolux / Siddhi or equivalent), including all necessary fittings, fixtures, and labour, as per detailed drawings and instructions of Architect/Engineer-in-Charge.	Sq.m	_____	_____	_____

**Notes:**

- **Unit:** Square Meter (based on visible area of the blind)
- **Rate:** Inclusive of complete supply, installation, and accessories
- Fabric, mechanism, and pelmet to match **approved sample**
- Installation to ensure **smooth operation and alignment**
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 100 : CHIPPING EXIST CONC.FROM RCC MEMBER** Surface of member should be checked for sounding using hammer. The damaged/ delaminated portion will sound hollow. The same should be marked to regular geometrical shapes. The edges should be grooved using slim and powerful 850W (230V) corded angle grinder about 25 mm deep. Grinder to have no load speed of 11500 rpm with on / off side switch and for use of cutting disc upto 100 mm. Concrete within the grooved area should be removed using High performance chipper hammer featuring low weight & low vibration having single impact energy of 7.5 J, full hammering frequency of 3180 impacts/minute, maximum chiselling performance of 900 cm<sup>3</sup>/min, weighted emission sound pressure level of 94 dB (A) according to EN 60745, Triaxial vibration for chiseling in concrete 12.1m/s<sup>2</sup> according to 60745-2-6 and having weight according to EPTA procedure 01/2003 of 5.6 Kgs

**Specification: Chipping of Existing Concrete from RCC Member**

Carrying out **removal of damaged/delaminated concrete** from RCC members, ensuring safe, precise, and controlled execution.

The work shall include:

**1. Inspection and Marking**

- Surface of the RCC member shall be **sounded using a hammer**.
- Damaged, hollow, or delaminated areas will be marked into **regular geometrical shapes**.

**2. Grooving Edges**

- Edges of marked area shall be **grooved using a corded angle grinder**:
  - Power: **850 W, 230 V**
  - No-load speed: **11,500 rpm**
  - Cutting disc: up to **100 mm**
  - On/off side switch for safe operation
- Groove depth: **25 mm**

**3. Chipping Concrete**

- Concrete inside grooved area to be removed using **high-performance chipping hammer**:
  - Single impact energy: **7.5 J**
  - Hammering frequency: **3180 impacts/min**
  - Maximum chiselling performance: **900 cm<sup>3</sup>/min**
  - Weighted emission sound pressure level: **94 dB(A)** (EN 60745)
  - Triaxial vibration: **12.1 m/s<sup>2</sup>** (EN 60745-2-6)
  - Weight: **5.6 kg** (EPTA 01/2003)
  - Low weight and low vibration for operator safety

**4. Safety and Cleanup**

- Proper disposal of chipped concrete.
- Surface left **ready for further repair or patching**.
- All work to comply with **site safety standards**.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Chipping <b>existing concrete from RCC member</b> : Marking damaged/delaminated areas by sounding, grooving edges using 850W angle grinder (25 mm depth), removing concrete using high-performance chipping hammer (7.5 J impact, 3180 bpm, 5.6 kg weight, low vibration), clearing debris, and leaving surface ready for repair, complete as per Engineer-in-Charge's instructions.	Sq.m	_____	_____	_____

## Notes:

- **Unit:** Square Meter (area of concrete to be chipped)
- **Rate:** Inclusive of labour, tools, disposal of debris, and safety precautions
- Equipment specifications to be **as stated or equivalent approved by Engineer-in-Charge**
- Surface must be **checked for hollowness before chipping**
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 101 : P/A ANTI CORROSIVE RUST REMOVER ON REINFORCEMENT**  
**:Providing and applying anti corrosive rust remover "Rusticide" of M/S Sunanda speciality coating pvt Ltd or equivalent approved including cleaning the reinforcement bars with wire brush or air blowing including removing of all loose particle with applying rust remover thoroughly on reinforcement bars by using cotton waste swab etc. comp. with all the required tools, tackles, labourers as required and as directed by the Engineer in charge. (Area of Concrete treated with poymer modified mortar shall be measured for payment please)**

### **Specification: Anti-Corrosive Rust Remover on Reinforcement**

Providing and applying **anti-corrosive rust remover** on exposed reinforcement bars prior to concrete repair:

### Scope of Work

1. **Surface Preparation**
  - Exposed reinforcement bars shall be **cleaned thoroughly** using wire brushes or air blowing to remove all **loose particles, rust, and dust**.
2. **Application of Rust Remover**
  - Apply "**Rusticide**" (M/s Sunanda Speciality Coating Pvt. Ltd or equivalent approved) using **cotton waste swabs or brushes** to ensure **complete coverage of all exposed reinforcement bars**.
  - Ensure **penetration into all crevices** and corners of reinforcement.
3. **Finishing**
  - Allow the **rust remover to react** as per manufacturer's instructions before proceeding with concrete repair or polymer-modified mortar application.
  - Ensure the surface is **free from loose residue** before further work.
4. **Tools and Labour**
  - Include all **required tools, tackles, safety equipment, labour, and consumables**.
  - Work to be executed as per **instructions of Engineer-in-Charge**.

### Measurement for Payment

- **Payment shall be made based on the area of concrete treated with polymer-modified mortar, not the area of reinforcement.**

## BOQ (Bill of Quantities)

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and applying <b>anti-corrosive rust remover (Rusticide or equivalent approved)</b> on exposed reinforcement bars, including thorough cleaning with wire brush/air blow, removal of loose particles, application with cotton waste swab, including all tools, tackles, labour and consumables, complete as per Engineer-in-Charge's directions. Payment shall be made on the <b>area of concrete treated with polymer-modified mortar.</b>	Sq.m	_____	_____	_____

### Notes:

- **Unit:** Square Meter (area of concrete surface subsequently treated with polymer-modified mortar)
- **Rate:** Inclusive of material, labour, tools, and consumables
- Ensure **manufacturer's instructions for application and reaction time** are followed
- Only **approved brands** to be used
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 102 : P/A STEEL PROTECTIVE COATING : Providing and Applying Steel protective coating: The exposed and cleaned reinforcement bars shall be applied with a single component cementitious corrosion inhibiting primer which shall be applied on the surface using suitable brush. Product: Mucis Protozione Ferro Mono of Thermax (Area of Concrete treated with poymer modified mortar shall be measured for payment please)**

### Specification: Steel Protective Coating on Reinforcement Bars

Providing and applying **steel protective coating** on exposed reinforcement bars to prevent corrosion during concrete repair works.

### Scope of Work

1. **Surface Preparation**
  - Reinforcement bars shall be **exposed and thoroughly cleaned**, removing all rust, loose particles, and dust (surface should be pre-treated as per rust remover specification).
2. **Application of Protective Coating**
  - Apply a **single-component cementitious corrosion-inhibiting primer** on cleaned reinforcement bars.
  - Application shall be done using a **suitable brush** ensuring **complete and uniform coverage**.
  - Product: **Mucis Protozione Ferro Mono (Thermax)** or equivalent approved.
3. **Finishing**
  - Ensure the primer **adheres properly** to all exposed steel surfaces.
  - Allow sufficient time for the primer to set as per manufacturer's instructions before applying **polymer-modified mortar**.
4. **Tools and Labour**
  - Include all **brushes, tools, tackles, consumables, and labour** required for proper application.
  - Work to be executed as per **instructions of Engineer-in-Charge**.

## Measurement for Payment

- Payment shall be based on **area of concrete subsequently treated with polymer-modified mortar**, not the steel surface area.

### BOQ (Bill of Quantities)

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and applying <b>steel protective coating</b> (Mucis Protozione Ferro Mono or approved equivalent) on cleaned and exposed reinforcement bars using suitable brush, including all tools, tackles, consumables, and labour, complete as per Engineer-in-Charge's directions. Payment shall be based on <b>area of concrete treated with polymer-modified mortar</b> .	Sq.m	_____	_____	_____

### Notes:

- **Unit:** Square Meter (area of concrete treated with polymer-modified mortar)
- **Rate:** Inclusive of material, labour, brushes, and consumables
- Only **approved products** to be used
- Primer application must **fully cover all exposed steel** before patching
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 103 : P&A POLYMER MODIFIED CEMENT MORTAR : Applying Corrosion Resistance single Component, polymer modified cement mortar to patch up the damaged concrete section in planks of upto 25mm thickness. Providing and applying Corrosion Resistance Single Component, polymer modified, fiber reinforced cementitious repair mortar having water powder ratio in the range of 0.16 and the mixed density of around 2.05 - 2.20 Gms/cc. The repair mortar shall achieve a minimum compressive strength of 45 MPa @ 28 days when tested as per ASTM C-109 and a flexural strength of 7 MPa when tested as per ASTM C 348. It shall achieve a minimum Adhesion Bond Strength of 2 MPa when tested on Standard Elcometer as per ASTM D 4541 - 85. The modulus of Elasticity shall be a minimum of 28 kN/mm<sup>2</sup> when tested as per BS 1881. Product: corrosion resistance single Component, polymer modified, fibre reinforced cementitious of M/s. Fosroc (Renderoc SP-40), Parex (Lanko-731).**

**Specification: Polymer-Modified Cement Mortar for Concrete Repair**

Providing and applying **polymer-modified cement mortar** for patching damaged concrete sections in RCC members.

Scope of Work

1. **Preparation**
  - Damaged concrete shall be **chipped and cleaned**.
  - Exposed reinforcement shall be treated with **anti-corrosive rust remover** and **steel protective primer** (as per earlier specifications).
2. **Mortar Application**
  - Use **corrosion-resistant, single-component, polymer-modified, fiber-reinforced cementitious repair mortar**.
  - Maximum patch thickness: **25 mm** per layer.
  - Water-to-powder ratio: **0.16**
  - Mixed density: **2.05–2.20 g/cm<sup>3</sup>**
  - Minimum compressive strength: **45 MPa @ 28 days** (ASTM C109)
  - Minimum flexural strength: **7 MPa** (ASTM C348)
  - Minimum adhesion/bond strength: **2 MPa** (ASTM D4541-85)
  - Modulus of elasticity: **≥ 28 kN/mm<sup>2</sup>** (BS 1881)
3. **Finishing**
  - Mortar shall be applied **evenly and smoothly**, flush with the existing concrete surface.
  - Surface to be **ready for curing and subsequent finishing**.
4. **Product/Brand**
  - Approved products:
    - **Fosroc Renderoc SP-40**
    - **Parex Lanko-731**
  - Equivalent approved brands may be used with **Engineer-in-Charge approval**.
5. **Tools, Labour, and Safety**
  - Include all **tools, scaffolding, labour, and consumables** for proper application.
  - Work to be executed as per **instructions of Engineer-in-Charge**.

Measurement for Payment

- Payment shall be based on **area of concrete treated**, measured in **square meters**, corresponding to patches made with polymer-modified mortar.

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	<p>Providing and applying <b>corrosion-resistant single-component polymer-modified fiber-reinforced cementitious repair mortar</b> (Fosroc Renderoc SP-40, Parex Lanko-731 or equivalent approved) on damaged concrete up to 25 mm thickness, including prior cleaning, surface preparation, anti-corrosive treatment of reinforcement, finishing flush with existing concrete, including all materials, tools, labour, scaffolding, and as per Engineer-in-Charge's directions. Payment shall be based on <b>area of concrete treated</b>.</p>	Sq.m	_____	_____	_____

**Notes:**

- **Unit:** Square Meter (area of concrete repaired)
- **Rate:** Inclusive of all materials, labour, tools, scaffolding, and finishing
- Mortar shall be applied **after rust remover and steel protective coating** are properly set
- Thickness of patch **not to exceed 25 mm per layer**
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 104 : Pro. And fixing false ceiling using Water proof Wooden Plywood Plank 9 mm Thick sections using water proof board of size 1220 mm x 1830 mm x 8.0 mm suspended by GI suspender channel of size 25 mm x 3 mm with intermediate channel of size 18 mm x 40 mm x 0.8 mm at 1220 mm center to center ceiling section of size 40 mm x 35 mm x 0.55 mm at 457 mm c/c and perimeter channel A of size 20 mm x 27 mm x 30 mm x 0.5 mm at edges & drops incl.paper tap sand soffit cleat, anchor fastener, scotch bolt connecting cleat,joining compound top coat on ceiling incl.making necy.opening for light fitting,diffuser etc. comp. as per detail drawing as directed Engineer in Charge.**

**Specification: False Ceiling Using Waterproof Wooden Plywood Planks**

Providing and fixing **false ceiling** using **waterproof plywood panels**, suspended from ceiling using GI channels and accessories as per approved drawings.

**Scope of Work**

1. **Ceiling Panels**
  - **Waterproof wooden plywood/planks of 9 mm thickness.**
  - Panel size: **1220 mm × 1830 mm × 8 mm** (or as per site requirement).
2. **Suspension Framework**
  - **Main GI suspender channel:** 25 mm × 3 mm
  - **Intermediate channel:** 18 mm × 40 mm × 0.8 mm at 1220 mm c/c
  - **Ceiling section/channel:** 40 mm × 35 mm × 0.55 mm at 457 mm c/c
  - **Perimeter channel A:** 20 mm × 27 mm × 30 mm × 0.5 mm at edges & drops
3. **Fixing Accessories**
  - Paper tape for joints, soffit cleats, anchor fasteners, scotch bolts connecting cleats
  - **Joining compound** and **top coat finishing** applied on ceiling surface.
4. **Openings and Cutouts**
  - Making necessary openings for **light fittings, diffusers, AC vents**, and other services as per drawings.
5. **Materials and Labour**
  - All **materials, labour, scaffolding, fasteners, tools, and finishing work** included.
  - Work to be executed as per **detailed drawings and instructions of Engineer-in-Charge.**

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and fixing <b>false ceiling</b> with 9 mm thick waterproof wooden plywood panels (1220×1830×8 mm), suspended from GI framework comprising 25×3 mm main channel, 18×40×0.8 mm intermediate channel at 1220 mm c/c, 40×35×0.55 mm ceiling sections at 457 mm c/c, and perimeter channels 20×27×30×0.5 mm, including paper tape, soffit cleat, anchor fasteners, scotch bolts, joining compound, top coat, making openings for light fittings/diffusers, complete with all materials, labour, and as per Engineer-in-Charge directions.	Sq.m	_____	_____	_____



#### Notes:

- **Unit:** Square Meter (visible ceiling area)
- **Rate:** Inclusive of plywood panels, GI framework, fasteners, tools, scaffolding, finishing, and cutouts
- All **dimensions and locations of openings** as per approved drawings
- Panels to be **properly aligned, jointed, and flush**
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 105 : Providing and supplying Main Table including table unit , side unit made with 19mm Thk. Plywood structure with 6mm thick veneer finished corian sheet (including buffing and fabrication cost) for Top desk and as per architect drawing finished with 1.0 mm Thk. decorative laminate on outside portion & 0.8 mm Thk. liner Laminate inside as specified & approved by architect fixed with necessary fixtures and fastening (Hardware) as per architect drawing. Provide Plastic Computer Table Grommet Cable Wire Outlet Hole Cover 60mm, Key-board tray, S.S legs, Drawers with telescopic roller channels , Handle and locking arrangements with all necessary fixtures and fastening .Provide Shutters as per drawing fixed with handle , hinges , magnet , complete with bidding patties and all required hardware .Provide footrest as per drawing. All exposed edges shall be covered with required Teak wood beading Patti finished with approved melamine polishing work. Complete as per architect's drawing and as per instruction of architect & engineer in charge. (Refer drawing)**

**Specification: Main Table with Side Unit and Accessories**

Providing and supplying **main table including table unit and side unit**, complete with accessories, hardware, and finishing as per approved drawings.

Scope of Work

1. **Table and Side Unit Construction**
  - **Structure:** 19 mm thick plywood
  - **Top Desk Finish:** 6 mm thick veneer finished **Corian sheet** (including buffing and fabrication)
  - **Outside Finish:** 1.0 mm thick decorative laminate
  - **Inside Finish:** 0.8 mm thick liner laminate (approved shade)
  - **All joints, edges, and surfaces** to be properly aligned and finished.
2. **Hardware and Accessories**
  - **Plastic grommet cable/wire outlet cover** (60 mm)
  - **Keyboard tray**
  - **S.S. legs** for support
  - **Drawers** with **telescopic roller channels**, handles, and locking arrangements
  - **Shutters** with hinges, handles, magnets, and necessary teak wood beading
  - **Footrest** as per drawing
3. **Edge Finishing**
  - All exposed edges shall be covered with **teak wood beading**
  - Finished with **approved melamine polish**
4. **Installation**
  - Complete fixing with **all necessary fixtures, fasteners, and hardware**
  - Work to be executed as per **architectural drawings and instructions of Engineer-in-Charge**

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and supplying <b>Main Table with Side Unit</b> made of 19 mm thick plywood, 6 mm thick veneer finished Corian sheet top (buffed & fabricated), outside 1.0 mm thick decorative laminate, inside 0.8 mm thick liner laminate, fixed with necessary hardware including plastic grommet cable/wire outlet cover (60 mm), keyboard tray, S.S legs, drawers with telescopic channels, handles, locks, shutters with hinges/magnets, footrest, and all teak wood beading with melamine polish, complete as per architect's drawings and Engineer-in-Charge directions.	Each	_____	_____	_____

**Notes:**

- **Unit:** Each (main table with side unit)
- **Rate:** Inclusive of plywood, Corian sheet, laminates, hardware, teak wood beading, melamine polishing, and installation
- All materials and finishing must match **approved sample**
- Work to be executed **as per approved architectural drawings**
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 106 : Providing and fixing aluminium partition comprising anodized / powder-coated aluminium sections of approved make and profile, including necessary vertical and horizontal members, cleats, brackets, screws, anchors, and all required accessories, complete as directed by the Engineer-in-Charge. The partition shall be constructed with lower solid panel portion and upper glazed portion (half glass), using 5–6 mm thick clear / frosted glass fixed with approved beading and rubber gasket, including cutting, edge polishing, and proper placement. The solid portion shall be made from approved board / sheet (as specified), securely fixed within aluminium framing. The work includes all labour, materials, T&P, carriage, cutting, fitting, assembling, sealing, and finishing complete in all respects as per site requirements and instructions of the Engineer-in-Charge**

#### **Specification: Aluminium Partition with Solid and Glazed Panels**

Providing and fixing **aluminium partitions** comprising anodized or powder-coated aluminium sections of approved make and profile, including all accessories, solid lower panels, and glazed upper panels as per approved drawings.

#### Scope of Work

1. **Aluminium Framework**
  - Constructed with **approved anodized or powder-coated aluminium sections**.
  - Includes **vertical and horizontal members**, cleats, brackets, screws, anchors, and all required accessories.
  - Proper alignment and rigidity to be ensured.
2. **Solid Lower Panel**
  - Made from **approved board/sheet** (as specified by Engineer/Architect).
  - Securely fixed within aluminium framing.
3. **Glazed Upper Panel**
  - **Half-height glazing** with 5–6 mm thick clear or frosted glass.
  - Glass fixed using **approved beading and rubber gasket**.
  - Includes **cutting, edge polishing, and accurate placement**.
4. **Accessories & Finishing**
  - All necessary **labour, tools, tackles, anchors, sealing compounds**, and finishing included.
  - Work includes **carriage, cutting, fitting, assembling, and sealing**.
  - Complete in all respects as per **site requirements and instructions of Engineer-in-Charge**.

#### **BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and fixing <b>aluminium partitions</b> with anodized/powder-coated aluminium sections, including vertical/horizontal members, cleats, brackets, screws, anchors, solid lower panel of approved board/sheet, upper glazed portion with 5–6 mm clear/frosted glass fixed with beading and rubber gasket, including cutting, edge polishing, fitting, assembling, sealing, finishing, and all labour, materials, and T&P, complete as per Engineer-in-Charge's instructions.	Sq.m	_____	_____	_____

Notes:

- **Unit:** Square Meter (partition area)
- **Rate:** Inclusive of aluminium sections, solid panels, glazing, hardware, labour, finishing, and installation
- Partition must match **approved sample and site alignment**
- Glass edges to be **polished and properly sealed with gaskets**
- **Mode of measurements and payment**
- The rate shall be for a unit of Sqm

**Item No. 107 : Providing and supplying a full-height storage unit measuring 2.0m (W) x 0.60m (D) x 2.10m (H), constructed with 19mm thick plywood structure. The exterior is finished with 4mm thick Veneer with melamine polish and 0.8mm thick balancing laminate, and the interior is lined with 0.8mm thick liner laminate, as per the specifications approved by the architect. The shutters are equipped with required handles, hinges, magnets, and locks. Removable plywood shelves are supported on side teakwood battens on both sides for adjustability. All exposed edges are covered with 8mm thick teakwood beading, finished with melamine polish. The unit includes all necessary hardware, fixtures, and fastenings, and the work is to be completed as per architect drawings and the instructions of the architect and Engineer-in-Charge.**

#### **Specification: Full-Height Storage Unit**

Providing and supplying a **full-height storage unit** with plywood structure, veneer finish, laminates, hardware, and fittings as per approved drawings.

#### Scope of Work

1. **Structure**
  - Made from **19 mm thick plywood**.
  - Exterior finished with **4 mm thick veneer** with **melamine polish** and **0.8 mm thick balancing laminate**.
  - Interior lined with **0.8 mm thick liner laminate** (approved shade).
2. **Shutters & Hardware**
  - Equipped with **handles, hinges, magnets, and locks**.
  - Shutters to open/close smoothly and align with the frame.
3. **Shelves**
  - Removable **plywood shelves**, supported on **side teakwood battens** on both sides for adjustability.
4. **Edge & Finish**
  - All exposed edges covered with **8 mm thick teakwood beading**, finished with **melamine polish**.
5. **Accessories & Installation**
  - Includes all **necessary hardware, fixtures, fastenings, tools, and labour**.
  - Work executed as per **architect drawings** and **instructions of Engineer-in-Charge**.
6. **Dimensions**
  - Width: **2.0 m**
  - Depth: **0.60 m**
  - Height: **2.10 m**

**BOQ (Bill of Quantities)**

Sr. No.	Description of Item	Unit	Quantity	Rate (₹)	Amount (₹)
1	Providing and supplying a <b>full-height storage unit</b> (2.0m W × 0.60m D × 2.10m H) made of 19 mm thick plywood, exterior finished with 4 mm veneer and 0.8 mm laminate, interior lined with 0.8 mm liner laminate, shutters with handles, hinges, magnets, locks, removable shelves on teakwood battens, all exposed edges covered with 8 mm teakwood beading with melamine polish, including all hardware, fixtures, fastenings, and installation as per architect drawings and Engineer-in-Charge directions.	Each	_____	_____	_____

**Notes:**

- **Unit:** Each (full-height storage unit)
- **Rate:** Inclusive of plywood, veneer, laminates, teakwood beading, hardware, finishing, and installation
- Shelves to be **adjustable and removable**
- All materials and finishes must **match approved samples**
- **Mode of measurements and payment**
- The rate shall be for a unit of Nos

**Item No. 108 : Providing and laying 60 x 60cm Antiskid Vitrified tiles 8 to 10 mm thick in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand) finishing with flush pointing in white cement.**

Specification – Providing and Laying 600 × 600 mm Anti-Skid Vitrified Tiles

Providing and laying **anti-skid vitrified tiles** of size **600 mm × 600 mm** and **8–10 mm thickness**, of approved make, shade, and pattern, in **flooring, treads of steps, and landings**.

Tiles shall be laid over a **12 mm thick cement mortar bed** in the proportion **1:3 (1 cement : 3 coarse sand)**, properly mixed, spread, and levelled to the required line, level, and slope.

Joints shall be uniform and finished with **flush pointing using white cement**, mixed with approved pigment if required. Tiles shall be properly aligned, tapped, and set to obtain a true, even, and non-slippery surface.

The work shall include:

- Cutting and shaping of tiles wherever required
- Proper bedding, jointing, cleaning, and curing
- All materials, labour, tools, and incidentals

The item shall be **complete in all respects**, as per drawings and directions of the Engineer-in-Charge. The rate shall be for a unit of **Sqm.**

**Item No. 109 : Providing and laying 60 x 60cm GTV Vitrified tiles 8 to 10 mm thick with pattern colour & Shade as detailed approve by architect ( 10% Dark colour tiles Pattern ) in skirting risers of steps and dedo on 10mm thick cement plaster 1:3 (1-cement : 3-coarse sand) and jointed with white cement slurry**

Specification – Providing and Laying 600 × 600 mm Anti-Skid Vitrified Tiles

Providing and laying **anti-skid vitrified tiles** of size **600 mm × 600 mm** and **8–10 mm thickness**, of approved make, shade, and pattern, in **flooring, treads of steps, and landings**.

Tiles shall be laid over a **12 mm thick cement mortar bed** in the proportion **1:3 (1 cement : 3 coarse sand)**, properly mixed, spread, and levelled to the required line, level, and slope.

Joints shall be uniform and finished with **flush pointing using white cement**, mixed with approved pigment if required. Tiles shall be properly aligned, tapped, and set to obtain a true, even, and non-slippery surface.

The work shall include:

- Cutting and shaping of tiles wherever required
- Proper bedding, jointing, cleaning, and curing
- All materials, labour, tools, and incidentals

The item shall be **complete in all respects**, as per drawings and directions of the Engineer-in-Charge. The rate shall be for a unit of **Sqm.**

**Item No. 110 : Providing & laying cement concrete 1: 4 : 8 ( 1 Cement : 4 Coarse sand : 8 graded B.T stone aggregate 20mm nominal size) Curing comp. including cost of form work in foundation and plinth**

The work shall be executed as per the specification of "Item No. 5.3.3(A) Page No. 38" of attached **Building Specification Booklet**.

Payment shall be made on **Cum** basis.



### **Item No. 111 : Providing and fixing Handle valve of approved brand (B) 25mm dia.,**

1. Valve Type: Stainless steel Handle valve Material: Stainless steel construction, Diameter: 25mm (as per IS approved standards), Brand: Specify the approved brand or list of acceptable brands

#### **1. Compliance Standards:**

Ensure that the valve meets the standards set by the Indian Standards (IS) for quality and safety., Mention any specific certifications or approvals required by local building codes or regulations.

#### **1. Installation Requirements:**

Specify the method for fixing the valve securely in place., Include any additional components needed for installation, such as gaskets, bolts, or flanges.

#### **1. Testing and Quality Assurance:**

Mention any required testing procedures to ensure the proper functioning of the valve., Specify any quality control measures or inspections needed before and after installation.

#### **1. Operational Specifications:**

Describe how the valve should operate and its intended function within the system., Include any specific instructions or considerations for opening, closing, and maintaining the valve.

#### **1. Safety Measures:**

Specify any safety precautions to be taken during installation or operation of the valve., Ensure compliance with safety standards to prevent accidents or malfunctions.

#### **1. Warranty and Maintenance:**

Outline any warranty information provided by the manufacturer., Specify recommended maintenance procedures to ensure the longevity and optimal performance of the valve.

#### **1. Testing and Commissioning:**

Specify any testing or commissioning procedures required before the valve is put into service., Detail the responsibilities for testing and commissioning, whether by the supplier, contractor, or third-party agency.

Payment shall be made on **No** basis.

### **Item No. 112 : Providing and fixing PVC SWR Nahni trap IS 14735 for drain - 100 mm diameter with jali of the following nominal diameter of self cleansing design with C.I sread down or hinged grating including the cost of cutting and making good the walls.**

#### **1.0. Materials**

1.1. The cast iron (spun) Nahni trap shall conform to M-69. The C.I. hinged or screwed down cover shall be of best quality

#### **2.0. Workmanship**

2.1. The Nahni trap with 100 mm. dia inlet and 50 mm. dia. outlet shall be fixed as per drawing or as directed.

2.2. The Nahni trap shall be jointed with C.I. Pipe, 75 mm. dia. with lead joints. The lead joints shall be done in conformation with I.S. 782.-1976.

#### **3.0. Mode of measurements and payment**

3.1. The rate includes cost of all labour, materials, tools and plants etc. required for satisfactory completion of this item including lead, jointing and testing.

3.2. The rate shall be for a unit of one number.

**Item No. 113 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Wall Hung European type W C Pan with in Built Jet , PP Soft closed seat cover, Hinges ,Dual Flush cistern, fixing accessory etc. complete of size 365 x 525 x 400 mm or 375 x 520 x 400 mm including cutting cutting holes and making goods the same including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 114 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Table top wash basin of 565 x 425 x 140 mm with hole for pillar tap with C.I or M.S brackets painted white including cutting cutting holes and making goods the same include. C.P. brass waste and waste pipes. including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 115 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Urinal of size 355 x 340 x 535 mm connetcting with PVC waste pipe ,Trap etc complete including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No 23.122.(A) Page No.172 Item No.23.135.(A) Page No.168 Item No.23.136.(A) Page No.168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 116 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Bib cock with wall flange including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No. 2.1 Page No. 170 Bib cock of Building Specification Booklet.

Payment shall be made on **No.** basis.

**Item No. 117 : Providing and fixing toilet paper holder.(A) C.P. Brass**

The work shall be executed as per the specification of "Item No. 23.146.(A) Page No. 169" of Building Specification Booklet.

The rate shall be for a unit of One number.

**Item No. 118 : Providing and fixing 600mm x 450mm bevelled edge mirror of superior glass mounted on 6mm thick A.C. sheet or plywood sheet and fixing to wooden pluge with C.P. brass screws and washers.**

**1.0. Materials**

1.1. The 600 mm. x 450 mm. size mirror shall be of superior glass with edge rounded over beveled as specified. It shall be free from flaws specks, or bubbles and its thickness shall not be less than 6 mm. The glass for the mirror shall be uniformly silver plated at the back and shall be free from silvering defects. Silvering shall have a protective uniform covering of red lead paint. The 6 mm thick plywood shall conform to M-37. The 6 mm. thick A.C. sheets shall conform to M-24.

**2.10. Workmanship**

2.11. The mirror of 600 mm. x 450 mm. size mounted on A.C. Sheet or plywood 6 mm thick with C.P. brass clips shall be fixed as directed, by fixing wooden plugs in wall and C.P. brass screws and washers. The work shall be carried out in best workman like manner.

**3.0. Mode of measurements & payment**

3.1. The rate includes cost of all labour and materials, tools and plant etc. required

The Payment shall be made on Number basis.

**Item No. 119 : Providing and fixing C.P. brass towel rail complete with C.P. brass brackets fixed to wooden plugs with C.P. brass screws. (B) 600mm x 20mm size**

**Materials:**

600mm x 120mm glass shelf with C.P. brass bracket and guard rail complete mixed to wooden plug with C.P. brass screws

**Labour:**

The Work of writing board shall be done with extreme finishing. The water proof plywood shall be fixed as support to glass board and glass shall be fitted on top as directed by Engineer in charge. All the fixtures and fastenings shall be fitted at right angle and shall be jointed with zero joint as directed by Engineer in charge. It shall be fixed on wall as directed by Engineer in charge.

**Mode of Payment:**

The Payment shall be made on Number basis of finished work done.

**Item No. 120 : Providing and fixing S.W. gully trap with C.I. grating brick masonry chamber and water tight C.I. cover with frame of 300mm x 300mm size (inside) with standard weight.(i) Square mouth traps.(B) 150mm x 100mm size P or R type**

**1.0. Materials :** (1) Water shall conform to M-1. (2) Cement mortar of proportion 1:5 shall conform to M-11. (3) Burnt brick shall conform to M-15. (4) The S.W. Gully trap of 100 mm. x 100 mm. size shall conform to M-70.

**7.3. Workmanship**

7.4. Excavation for gully trap shall be done true to dimensions and levels as indicated on plans or as directed. The excavation work shall generally be done as per relevant specifications of item 4.0.0. of earth work.

**7.5. Fixing:**

7.5.1. The gully trap shall be fixed over cement concrete 1:5:10 (1 cement : 5 sand : 10 graded brick bats aggregate 40 mm nominal size) foundation. 650 square and 100 mm. thick. The depth of top of concrete below the ground level shall be 675 mm. The jointing of gully outlet to the branch drain shall be done similar to jointing of S.W. pipe as described in item No. 24.1 (A) (Building Specification Booklet).

- Brick masonry chamber : After fixing and testing gully and branch drain, a brick masonry 300 x 330 mm. inside with bricks in CM 1:5 (1 cement : 5 sand) shall be built with a 100 mm. brick

work round OH; gulley trap from the top of bed concrete up to ground level. The space between the chamber walls and the trap shall be filled with cement concrete 1:5:10. The upper portion of the chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1:3 (1 cement: 3 sand) finished with floating coat of neat cement. The corners and bottom of the chamber shall be rounded off so as to slope towards the grating.

- C.I. cover with frame 300 mm, x 300 mm. (inside) size shall then be fixed on the top of the brick masonry with C.c. 1:2:4 (1 part : 2 coarse sand : 4 graded aggregate 20 mm. nominal size) 40 mm. thick and rendered smooth. The finished top of the cover shall be left about 40 mm. above the adjoining ground level so as to exclude the surface water from entering the gulley trap.

## 7.2. Mode of measurements & payment

7.3. The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item as described above.

3.2. The rate shall be for a unit of one number basis.

**Item No. 121 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Angular stop cock with wall flange including labour, material, transportation etc. complete as directed by engineer in charge.**

Specification Details:

- **Make & Brand:** Jaquar / ESSCO or equivalent (approved by the engineer in charge).
- **Type:** Angular Stop Cock (with wall flange).
- **Material:** The stop cock should be made of **C.P. brass** (Chromium-plated brass) or an equivalent high-quality corrosion-resistant material, ensuring long-lasting durability.
- **Design:**
  - The stop cock must feature an **angular design** for easy installation and operation.
  - It should come with an attached **wall flange** to facilitate secure fitting to the wall and ensure the device is stable and properly fixed.
- **Size:** The size should be as per standard dimensions suitable for typical domestic or commercial plumbing systems.

Installation Details:

- **Labour:** The specification covers all labour charges for installing the angular stop cock, including the fitting of the wall flange and ensuring it is securely connected to the plumbing system.
- **Materials:** The cost of the angular stop cock, wall flange, and any other necessary components for installation is included.
- **Transportation:** The cost of transporting the materials to the site should be included in the scope of work.
- **The rate shall be for a unit of one number basis.**

**Item No. 122: Providing and fixing window having extruded aluminum Colour Powder Coated section frame main outer size 63.50 x 38.10 x 1.95 mm,@ Wt 1.094 Kg / Rmt, horizontal two track member size 61.85 mm x 31.75 mm x 1.20mm @ wt.of 0.695 Kg/mt, vertical member of size 61.85 mm x 31.75mm x 1.30 mm @ wt.of 0.659 Kg/mt with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt, vertical member of size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window**

Window Specification: Aluminum Powder-Coated Sliding Window

1. Frame Details (Main Outer Frame)

**Material:** Extruded Aluminum, Powder Coated (Color as per design)

**Profile Size:** 63.50 mm × 38.10 mm × 1.95 mm

**Weight:** 1.094 kg per running meter (Rmt)

**Function:** Main structural frame holding all members and glass

2. Horizontal Track Members

**Profile Size:** 61.85 mm × 31.75 mm × 1.20 mm

**Weight:** 0.695 kg per meter

**Function:** Support sliding shutters, allow smooth horizontal movement

3. Vertical Members

**Profile Size:** 61.85 mm × 31.75 mm × 1.30 mm

**Weight:** 0.659 kg per meter

**Function:** Vertical support for the frame and sliding shutter tracks

4. Sliding Shutter Profiles

**Horizontal Member Size:** 40 mm × 18 mm × 1.29 mm

**Vertical Member Size:** 40 mm × 18 mm × 1.29 mm

**Weight:** 0.456 kg per meter (for both horizontal and vertical shutter members)

**Function:** Form the sliding panels that hold the glass

5. Glazing

**Glass Type:** Float glass, 5 mm thick

**Tint:** Bronze color, transparent

**Function:** Provide visibility, light entry, and aesthetic finish

6. Fittings & Fixtures

**Material:** Powder-coated aluminum (matching the frame)

**Includes:** Handles, rollers, locks, and other necessary fixtures for sliding functionality

7. Sealant & Glass Fixing

**Sealant:** Transparent silicone

**Purpose:** Fix the glass securely to the frame, prevent water and air infiltration

8. Installation Notes

The window should be **fixed as per manufacturer's details** ensuring proper alignment and smooth sliding operation.

**All work should be complete and finished** including glass, seals, and powder-coated surfaces.  
**The rate shall be for a unit of one Sqm. basis.**

**Item No. 123 : Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats architraves, holdfasts and other attachment etc. complete and stacking them within all lead and lift.(i) Not exceeding 3 Sq.M. in area**

The work shall be executed as per the specification of "**Item No. 20.49.(II) Page No. 150**"of attached **Building Specification Booklet.**

**2.0. Mode of measurements of payment**

**2.1.** The relevant specifications of item No. 20.49 (I) above shall be followed.

**2.2.** The rate shall be for a unit of Each number.

**Item No. 124 : Providing 15mm thick mala plaster in single coat on fair on brick / concrete wall for interior plastering in C.M.1:3 ( 1 Cement : 3 Coars sand ) incl. finishing with a floating coat on neat cement slurry**

**1.0. Materials**

**1.1.** Water shall conform to M-1. The cement mortar of proportion 1:3 shall conform to M-13.

**2.0. Workmanship**

**2.1. Scaffolding:**

Wooden bullies, bamboos, planks, trestles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

**2.2. Preparation of back-ground :**

**2.2.1.** The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be toughened by wire brushing if it is not hard and by

hacking if it is hard. In case of concrete surface, if a chemical retarded has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the readers if left on the surface. Trimming of projections on brick/concrete surfaces where necessary shall be carried out to get an even surface.

**2.2.2.** Raking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before carrying out the plaster work.

**2.2.3.** The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such area shall be moistened again.

**2.2.4.** For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready

and the temporary supports of the ceiling resting on the wall of the floor have been removed. Ceiling plaster shall

be completed before starting plaster to walls.

**2:3. Application of plaster:**

**2.3.1.** The plaster about 15x15 cms. shall be first applied horizontally and vertically at not more than 2 meters intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small

upward and sideways movements at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a smooth or a sandy granular texture is required Excessive troweling or overworking

the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Hounding or chamfering, corners, arises junctions etc. shall be carried out

with proper templates to be size required.

**2.3.2.** Cement plaster shall be used within half an hour after addition of water. And mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

**2.3.3.** In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically, when recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together.

Plastering

work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises.

It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

**2.3.4.** Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only

as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of

building in hot air or dry weather shall be prevented by hanging matting or gunny bags oh the outside of the plaster

and keeping them wet.

**3.0. Mode of measurements & payment**

**3.1.** The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

**3.2.** All plastering shall be measured in square meters unless otherwise specified. Length breadth or height shall be measured correct to a centimetre.

**3.3.** Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.

**3.4.** This item includes plastering up to floor two level.

**3.5.** The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

**3.6.** Soffits of stairs shall be measured as plastering on ceilings, following soffits shall be measured separately.

**3.7.** For jambs, soffits, sills etc. for openings not exceeding 0.5 sq. met each in area for ends of joints beams, posts, girders, steps etc. not exceeding 0.5 sq. mt each in area and for openings exceeding 0.5 sq. mt and not exceeding 3.00 sq. mt. in each area deductions and additions shall be made in the following manners.

(a) No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq. mt each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, for finish to plaster around ends of joints, beams posts etc.

(b) Deduction for openings exceeding 0.5 sq. mt but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, (i) When both faces of all wall are

plastered with same plaster, deduction shall be made for one face only, (ii) When two faces of wall are plastered with different types of plasters or if one face is plastered and the other pointed, deductions shall be made from the

plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other

side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and / or pointing as the case may be.

**3.8.** For openings having door frames equal to or projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.

**3.9.** In case of openings of area above 3 sq. mt. each, deduction shall be made for openings but jambs, soffits and sills shall be measured.

**3.10.** The rate shall be for a unit of One sq. meter



**Item No. 125 : Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C member including stacking of serviceable material and disposal of unserviceable from site of work with all lead and lift**

The work shall be executed as per specification of Item No. 83 except the work is for **Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C member including stacking of serviceable material and disposal of unserviceable from site of work with all lead and lift**

Payment shall be made on **Sqm** basis.

**Item No. 126 : Repairing to Door / Window including disassembling from frame, wroughting, providing patti, angles, replacing / repairing stoppers - aldrops - handles etc. for proper fixing in to frame hole etc. complete for smooth operation and proper utilization including assambeling and Refixing of the same and Painting one coats (excluding priming coat) on previously painted wood and wood based surface with enamel paint, to give an even shade including cleaning the of all dirt, dust and other foreign matter. as directed by Engineer-in-charge.**

The work shall be executed as per specification of Item No. 26 except the work is for **Repairing to Door / Window including disassembling from frame, wroughting, providing patti, angles, replacing / repairing stoppers - aldrops - handles etc. for proper fixing in to frame hole etc. complete for smooth operation and proper utilization including assambeling and Refixing of the same and Painting one coats (excluding priming coat) on previously painted wood and wood based surface with enamel paint, to give an even shade including cleaning the of all dirt, dust and other foreign matter. as directed by Engineer-in-charge.**

Payment shall be made on **Sqm** basis.

**Item No. 127 : Providing and laying Synroof High bond ecentromentric premium quality acrylic coating as a water proofing membrance finished which consists of a coat of bitumine primer & 80 CSM membrance in sunk slab , Terrace Slab with ultraviolet resistance and working upto any height etc. complete as directed by Engineer in charge**

**1. Detailed Specification**

Specification: Providing and Laying Acrylic Waterproofing Membrane System

Providing and laying **Synroof High Bond Eccentric Premium Quality Acrylic Coating** as a waterproofing membrane system over **sunken slabs and terrace slabs**, including surface preparation and complete treatment.

The system shall consist of:

- Application of **bituminous primer coat** on the prepared surface
- Laying of **80 GSM CSM (Composite Reinforcement Mat) membrane** embedded within the coating system
- Application of **high bond acrylic coating** in multiple coats to achieve a seamless waterproof membrane

The finished surface shall be **ultraviolet (UV) resistant**, durable, and suitable for exposed terrace conditions.

The work shall include:

- Proper **surface cleaning, preparation, and crack filling if required**
- Uniform application ensuring **complete bonding without air gaps**
- Treatment of **junctions, corners, and outlets**
- Application up to **any height and at all levels**

The system shall be applied strictly as per manufacturer specifications and **instructions of the Engineer-in-Charge**, ensuring complete waterproofing performance.

All materials, labor, tools, tackles, scaffolding, curing, and incidental works required for proper completion of the job shall be included.

**2. BOQ Item (Detailed)**

Providing and laying Synroof High Bond premium acrylic waterproofing coating over terrace/sunken slab, including bituminous primer, 80 GSM CSM reinforcement membrane, multiple acrylic coats, UV resistant finish, surface preparation, and all materials and labor complete as per manufacturer specifications and Engineer-in-Charge instructions.

**Unit:** Sq. Mtr.

**3. Short Tender Line Item**

Providing and applying acrylic waterproofing membrane with primer and CSM reinforcement on terrace/sunken slab, complete with UV resistant finish.

**4. Measurement Clause**

- Measured in **square meters (Sq. Mtr.)** of treated surface area
- No deduction for small openings, outlets, or pipes
- No separate measurement for primer, reinforcement, or multiple coats

**Item No. 128 : Providing and fixing washbasin with single hole for pillar tap with C.I. or M.S. brackets painted white including sutting holes and making good the same but excluding fittings.(A) Vitreous China: (ii) Flat Back washbasin 550 mm x 400mm size. (i) In white colour.**

The work shall be executed as per the specification of "**Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168**" of attached Building Specification Booklet.

Payment shall be made on Each basis.

**Item No. 129 : Providing and fixing pillar tap, capstan head, screw down high pressure with screws, shanks and back nuts. (i) 15mm dia.**

The work shall be executed as per the specification of "Item No 23.95(A) Page No. 170 " of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 130 : Providing and laying Vitrified tiles 8 to 10 mm thick, 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3-coarse sand ) finishing with flush pointing in white cement.**

Specification – Providing and Laying Vitrified Floor Tiles

Providing and laying **vitrified tiles** of **8–10 mm thickness**, size of approved make and shade, 24" x 24" in **flooring, treads of steps, and landings**.

Tiles shall be laid over a **12 mm thick cement mortar bed** in the proportion **1:3 (1 cement : 3 coarse sand)**, properly mixed and spread to true levels and slopes.

Joints shall be kept uniform and finished with **flush pointing using white cement**, mixed with approved pigment if required. Tiles shall be properly aligned, tamped, and set to achieve an even and smooth surface.

The work shall include:

- Cutting of tiles wherever required
- Proper bedding, jointing, and finishing
- Cleaning and curing after laying

The item shall be **complete in all respects**, including all materials, labour, tools, and incidentals, as per drawings and directions of the Engineer-in-Charge.

The rate shall be for a unit of **Sqm**.

**Item No. 131 : Providing and fixing Fly proof galvanised S.S. wire gauge of I.S.I. gauge designation 85 G. with wire of dia. 0.56 mm to windows and elevating windows including 60 x 20 mm beading of teak wood.**

Specification: Providing & Fixing Fly-Proof SS Wire Gauge with Aluminium Frame

Providing and fixing **fly-proof stainless steel wire gauge (mosquito mesh)** to windows and ventilators, comprising the following:

*Wire Mesh*

- Supplying and fixing **stainless steel wire mesh of ISI gauge designation 85 G**, made from **0.56 mm diameter wire**, ensuring:
  - Uniform mesh
  - Proper visibility and ventilation
  - Resistance to corrosion

*Frame*

- Providing and fixing **anodized / powder-coated aluminium sections** of approved size and profile, fabricated to required dimensions for windows and ventilators.

*Fittings & Accessories*

- Providing all necessary fittings and fixtures, including:
  - Aluminium clips / beading
  - Corner cleats
  - Rubber / PVC gaskets
  - Screws, fasteners, and fixing accessories

*Installation*

- Fixing the mesh securely within the aluminium frame.
- Properly installing the frame to window openings ensuring:
  - Tight fit
  - No gaps for insect entry
  - Easy removal (if required for cleaning)

*Finish*

- Aluminium sections to be **anodized or powder-coated** in approved colour and finish.

*Workmanship*

- The work includes **all materials, labour, tools, transportation**, complete in all respects, as per:
  - Approved drawings
  - Specifications
  - Instructions of the **Engineer-in-Charge**

Payment shall be made on **Sqm** basis.

**Item No. 132 : Providing and fixing flush door shutters, solid core construction with frame of first class hardwood with cross board and face veneer or plywood face panels, including anodised aluminium butt hinges with necessary screws. (B) Non-decorative type and block board core anodised aluminium butt hinges in flush door shutters (2) 35 mm thick.**

Specification: Flush Door Shutters

1. General Description

**Type:** Flush door shutter, solid core construction

**Thickness:** 35 mm

**Usage:** Non-decorative type (suitable for internal partitions or functional doors)

2. Core & Frame

**Frame Material:** First-class hardwood

**Construction:** Solid core with cross boards to provide rigidity and stability

**Core Type:** Block board core (engineered to reduce warping and ensure uniform strength)

3. Face Panels

**Material:** Veneer or plywood face panels (as per project specification)

**Finish:** Plain, non-decorative (can be painted or laminated later as required)

4. Fittings

**Hinges:** Anodised aluminum butt hinges

**Quantity:** As required for proper shutter hanging (usually 3 per door)

**Screws:** Necessary screws included, compatible with hinges and frame

5. Construction Features

Solid and stable, designed to avoid warping or sagging

Smooth finish ready for paint, polish, or laminate

Designed for flush, non-decorative installation

6. Installation

Door shutter to be hung using provided butt hinges on prepared door frame

Ensure proper alignment and smooth operation after installation

All fittings to be securely fixed, flush with door surface

This describes a **standard 35 mm thick flush door** with a solid block board core, hardwood frame, and anodized aluminum fittings.

If you want, I can **also make a simple labeled diagram of the door cross-section** showing the hardwood frame, block board core, and face veneer to make it visually clear for site work or tender documents.

Payment shall be made on **Sqm** basis

**Item No. 133 : Providing and fixing 35 mm thick shutters for Doors, windows and clear story windows including anodised aluminium butt hinges with necessary screws. (A) Indian Teak Wood(iii) Partly panelled and partly glazed.**

**Specification: 35 mm Thick Shutters for Doors, Windows, and Clerestory Windows**

1. General Description

- **Shutter Thickness:** 35 mm
- **Material:** Indian Teak Wood (first-class, well-seasoned)
- **Type:** Partly panelled and partly glazed (for combination of solid and transparent sections)
- **Usage:** Suitable for doors, windows, and clerestory windows

2. Frame

- **Material:** First-class hardwood (Indian Teak)
- **Construction:** Solid frame providing structural stability
- **Cross Members:** Integrated for panel and glass support

3. Panel Sections

- **Material:** Teak wood panels (matching frame)
- **Finish:** Smooth and ready for polishing, painting, or varnishing

4. Glazed Sections

- **Material:** Clear or tinted glass (as per project specification)
- **Glass Thickness:** Typically 5–6 mm for safety and durability
- **Fixing:** Glass secured within the teak frame using glazing beads or stops

5. Fittings

- **Hinges:** Anodised aluminum butt hinges
- **Quantity:** As per door/window size (usually 2–3 hinges per shutter)
- **Screws:** Necessary screws included for proper fixing

6. Installation

- Shutters to be fitted flush with the frame
- Hinges to be securely fixed to allow smooth operation
- Glass sections to be sealed with suitable putty or silicon for airtight fixing

7. Features

- Combination of solid wood panels and glazed sections for aesthetics and natural light
- Durable and termite-resistant, owing to quality Indian Teak Wood
- Ready for finishing as per design requirements

If you want, I can also **make a labeled diagram showing a cross-section of this shutter** with panel, glass, frame, and hinge placement—very useful for clarity in tender or site instructions.

Payment shall be made on **Sqm** basis

**Item No. 134 : Providing and fixing Urinal or approved quality including connecting the Urinal with waste pipe , tap etc. complete.(A) White earthenware flat back or corner type size 430mm x 260mm x 350mm.**

**Specification: White Earthenware Urinal (Flat Back or Corner Type)**

1. General Description

- **Type:** Urinal, flat back or corner type
- **Material:** White glazed earthenware (vitreous china)
- **Size:** 430 mm × 260 mm × 350 mm (height × width × depth, typically)
- **Usage:** Suitable for public or domestic restrooms

2. Features

- Smooth, hygienic surface for easy cleaning
- Resistant to stains and odors
- Designed for efficient water flow and drainage

3. Installation Requirements

- **Fixing:** Properly mounted on wall with suitable brackets or anchors
- **Connection:**
  - Connected to waste pipe (PVC or as per plumbing specification)
  - Connected to flushing tap or automatic flush system
- **Sealant:** Use approved sealant at pipe joints to prevent leakage

4. Accessories

- Flush tap or valve (as per design)
- Waste pipe and fittings for connection to drainage system
- Necessary screws, brackets, or supports

5. Work Completion

- Ensure the urinal is **properly aligned and leveled**
- Test for proper flushing and waste disposal
- Finish with neat silicone sealing around wall junctions

This describes a **standard white earthenware urinal** that's easy to maintain and includes all connections to waste and flush systems.

If needed, I can also **draw a labeled diagram showing the urinal, waste pipe, and flush connections** for better clarity during installation.

Payment shall be made on **Each** basis

**Item No. 135 : Scraping oil paint from steel and other metal surface and making the surface even (with Hand Scraping.).**

**1.0. Workmanship**

The old paint from steel and other surface shall be scraped thoroughly with hand scraper followed by wire brushing

(first with coarse and then with fine brushes) and finally sand papering with coarse and paper (No.3) steel wood (No.2)

or emery paper (No.3) or with emery clothes. This shall then be wiped finally with mineral turpentine to remove grease

and perspiration of hand marks etc. and allowed to dry. The surface shall be made even and smooth.

**2.0. Mode of measurements and payment**

**2.1.** The work shall be measured in actual area of work done.

**2.2.** The rate shall be for a unit of one sq. meter.

**Item No. 136 : Painting two coat (excluding priming coat) on previously painted steel and other metal surface with enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.**

**The work shall be executed as per the specification of "Item No. 18.57 Page No. 136" of Building Specification Booklet.**

**The rate shall be for a unit of one sq. meter.**

**Item No. 137 : Providing and fixing water closet squatting Pan (Indian type W.C. Pan) size 580mm (Earthwork, bed concrete, foot rest and trap to be measured and paid for separately) (A) Vitreous China. (I) Long pattern = White colour**

**The work shall be executed as per the specification of "Item No. 23.111.(A)(I) Page No. 163 Item No. 23.113 (A) Page No. 165 Item No. 23.114 Page No. 165 Item No. 23.96 (A) + 23.00.4 Page No. 171" of attached Building Specification Booklet.**

**Payment shall be made on Nos/Each basis.**



**Item No. 138 : ONE SIDE LAMINATE ONE SIDE VINEER FINISH FLUSH DOOR . :-** Providing Material & Labour charge for making Flush Door (finished size of door is 46 mm) of size 975 mm x 2400 mm considering waterproof flush door sheet of 38 mm thkness covered outer side by 1.00 mm Laminate & Inside finished with 4 mm thk vineer finished with PU polish on single sides of shutter & 1.0 mm thk laminate at other side of shutter supported by SS -316 finish hinges. All exposed framing of 62 mm x12 mm made by teak wood bidding complete with polish. Finishing with all necessary hardwares like handles, conceal mortise locks, cylinders with 6 nos of keys, stopers,tower bolt,MS nails, SS-304 screws etc. as per details given in drawing and as per instructions of Architect/Engineer In charge. Please see the Attached Make List for Apporoved Makes.

### **Specification: One Side Laminate & One Side Veneer Finish Flush Door**

Providing and fixing **flush door shutters** of finished thickness **46 mm** and size **975 mm x 2400 mm**, comprising the following:

- **Core Material:**  
Waterproof flush door core of **38 mm thickness**.
- **Surface Finish:**
  - **Outer Face:** Finished with **1.0 mm thick decorative laminate**.
  - **Inner Face:** Finished with **4 mm thick veneer**, coated with **PU polish**.
  - Opposite face to veneer shall have **1.0 mm thick laminate finish**.
- **Edge Framing:**  
All exposed edges to be finished with **teak wood beading of size 62 mm x 12 mm**, including polishing.
- **Hardware & Fittings:**  
Providing and fixing all necessary hardware, including:
  - **SS-316 finish hinges**
  - Handles
  - Concealed mortise lock
  - Cylinder with **6 keys**
  - Door stoppers
  - Tower bolts
  - MS nails
  - SS-304 screws
  - Any other required accessories

Here's a structured **Approved Make List** for your **Flush Door (Laminate + Veneer Finish)** specification. This aligns with common architectural and tender standards in India:

#### Approved Make List

##### *1. Flush Door (Core Material)*

- Greenply
- CenturyPly
- Kitply
- Archidply

##### *2. Decorative Laminate (1.0 mm thick)*

- Greenlam
- Century Laminates
- Merino
- Royale Touche

### *3. Veneer (4 mm thick)*

- Greenply Veneers
- Century Veneers
- Durian
- Duro Veneers

### *4. Adhesives (Fevicol or Equivalent)*

- Pidilite (Fevicol SH / Marine)
- Araldite
- Vamicol

### *5. PU Polish*

- ICA
- Asian Paints (PU)
- Berger PU
- Sirca

### *6. Hinges (SS-316 Finish)*

- Hafele
- Hettich
- Dorset
- Ebco

### *7. Mortise Lock & Cylinder*

- Godrej
- Dorset
- Yale
- Europa

### *8. Handles*

- Hafele
- Hettich
- Dorset
- Ozone

### *9. Tower Bolts / Stoppers*

- Godrej
- Ebco
- Dorset
- Ozone

### *10. Screws (SS-304)*

- Kundan
- Atul
- Deepak Fasteners

### 11. Nails (MS)

- Tata Wiron
- Jindal

### 12. Teak Wood Beading

- Approved local seasoned teak wood (1st class, knot-free, termite treated)

Note:

- All materials shall be **ISI marked** where applicable.
- Final selection must be **approved by Architect/Engineer-in-Charge**.

### Single-Line Tender Clause (Make List)

Approved makes shall be **Greenply/CenturyPly/Kitply/Archidply (flush door), Greenlam/Century/Merino/Royale Touche (laminate), Greenply/Century/Durian/Duro (veneer), Pidilite/Araldite/Vamicol (adhesive), ICA/Asian Paints/Berger/Sirca (PU polish), Hafele/Hettich/Dorset/Ebco (hinges & hardware), Godrej/Yale/Europa/Dorset (locks), Kundan/Atul/Deepak (screws), Tata Wiron/Jindal (nails)** or equivalent as approved by the Engineer-in-Charge.

### CPWD / PWD Style Make List Format

Sr. No.	Material	Approved Makes
1	Flush Door	Greenply / CenturyPly / Kitply / Archidply
2	Laminate	Greenlam / Century / Merino / Royale Touche
3	Veneer	Greenply / Century / Durian / Duro
4	Adhesive	Pidilite / Araldite / Vamicol
5	PU Polish	ICA / Asian Paints / Berger / Sirca
6	Hinges & Hardware	Hafele / Hettich / Dorset / Ebco
7	Mortise Lock & Cylinder	Godrej / Yale / Europa / Dorset
8	Handles	Hafele / Hettich / Dorset / Ozone
9	Tower Bolts / Stoppers	Godrej / Ebco / Dorset / Ozone
10	Screws (SS-304)	Kundan / Atul / Deepak
11	Nails (MS)	Tata Wiron / Jindal
12	Teak Wood	1st Class Seasoned Teak Wood (Approved Source)

Payment shall be made on **Sqm** basis.

**Item No. 139 : Wall painting (Two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth.**

### **1.0. Materials**

Water shall be conforming M-1. The plastic emulsion shall conform to I.S.: 5411-1969 (part-I).

### **2.0. Workmanship**

**2.1.** Scaffolding: The relevant specifications of item-No. 18.11 Para 2.1 shall be followed.

**2.2.** Preparation of surface: The relevant specification of item No. 18.44 Para 2.2 shall be followed.

### **2.3. Preparation of Mix :**

This shall be done as per manufacturer's instructions. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added shall be as per manufacturer instructions.

### **2.4. Application:**

2.4.1. Before pouring into small containers for use, the paint shall be stirred thoroughly in item container. When applying also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

2.4.2. The paint shall be laid on evenly and smoothly by means of crossing and laying off the crossing and consist of covering the area over with paint, brushing the surface hard for the first time over and then, brushing alternately in opposite direction two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush Marks shall be left after the laying off is finished. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of moldings, etc. shall be left on the work. The full process of crossing and laying off will constitute one coat.

2.4.3. The paint shall be applied with brush or rollers. For undecorated surfaces, the surface shall be treated with minimum two coats of cement water proofing paint. The second or subsequent coat shall not be started until the proceeding coat has become sufficiently hard to resist marking by brushing being used.

2.4.4. The surface on finishing shall present a flat velvety smooth finish. It shall be even and uniform in shade without patches, brush marks, paint drops etc.

### **2.5. Precautions:**

(b) Old brushes if they are to be used with emulsion paints, shall be completely dried of turpentine or oil paint by washing in warm soap water. Brushes shall be quickly washed in water immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush.

(c) In the preparation of wall for plastic emulsion painting, no oil base putty shall be used in filling cracks, holes etc.

(d) Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

(e) Washing of surfaces treated with emulsion paint shall not be done within 3 to 4 weeks of application

2.6. Protective payment: The relevant specifications of item No. 18.11 shall be followed.

3.0. Mode of measurements and payment

3.1. The relevant specifications of item No. 18.11 shall be followed.

**3.2. The rate shall be for a unit of One sq. meter.**

**Item No. 140 : Providing and fixing powder coated aluminum standard extruded section glazed type Door of 63.50 mm x 38.10 mm x 1.95 mm or as specified drawing or as directed having Top & bottom panel of 5 mm thick coloured float glass at top including all fixtures and fastenings like glazing clips, rubber gasket, hardware like handel , tower bolt , 6 liver mortise lock etc. and labour etc. complete as directed by engineer in charge.**

### **Specification: Powder Coated Aluminium Glazed Door**

Providing and fixing **powder-coated aluminium glazed door shutters** made from **standard extruded aluminium sections** of size **63.50 mm x 38.10 mm x 1.95 mm thick** (or as specified in drawings), comprising the following:

- **Frame & Shutter:**  
Fabricated from approved quality **extruded aluminium sections**, properly cut, machined, and assembled to required size and design.
- **Finish:**  
Aluminium sections to be **powder coated** in approved colour and shade, with uniform thickness as per relevant standards.
- **Glazing:**  
Providing and fixing **5 mm thick coloured float glass** in panels (top and/or bottom as per design), securely fixed with:
  - Aluminium glazing clips
  - EPDM / neoprene rubber gaskets
- **Hardware & Fittings:**  
Providing and fixing all necessary approved quality fittings, including:
  - Handles
  - Tower bolts
  - **6 lever mortise lock** with keys
  - Hinges
  - All required accessories
- **Fixing:**  
The door shall be properly installed in position with necessary **fixtures, fasteners, screws, anchors**, etc., ensuring alignment, smooth operation, and stability.
- **Workmanship:**  
The work includes **all materials, labour, tools, and tackles**, complete in all respects, as per:
  - Approved drawings
  - Specifications
  - Instructions of the **Engineer-in-Charge**

### **Optional Short Tender Item (One-Line)**

Providing and fixing powder-coated aluminium glazed door using 63.50 x 38.10 x 1.95 mm extruded sections with 5 mm thick coloured float glass panels, including all fittings, fixtures, hardware, and labour, complete as per drawings and direction of Engineer-in-Charge.

### **Single-Line Tender Clause (Make List)**

Approved makes shall be **Jindal/Hindalco/Indal (aluminium sections), Jotun/Asian Paints/Akzo Nobel (powder coating), Saint-Gobain/Modi Float/Asahi India Glass (glass), Hafele/Hettich/Ebco/Dorset (hardware), Godrej/Yale/Europa/Dorset (locks), Anand/Classic/Alufit (gaskets & accessories)** or equivalent as approved by the Engineer-in-Charge.

## CPWD / PWD Style Make List Format

Sr. No.	Material	Approved Makes
1	Aluminium Sections	Jindal / Hindalco / Indal
2	Powder Coating	Jotun / Asian Paints / Akzo Nobel
3	Float Glass (5 mm)	Saint-Gobain / Modi Float / Asahi India Glass
4	Hardware (Handles, Hinges, Accessories)	Hafele / Hettich / Ebco / Dorset
5	Mortise Lock	Godrej / Yale / Europa / Dorset
6	Gaskets (EPDM/Neoprene)	Anand / Classic / Alufit
7	Fasteners / Screws	Hilti / Fischer / Atul
8	Tower Bolts	Godrej / Dorset / Ebco / Ozone

### Notes:

- Powder coating thickness should be **minimum 50–60 microns** (or as specified).
- Aluminium sections shall conform to **relevant IS standards**.
- All materials must be **approved by Engineer-in-Charge** prior to installation.
- Equivalent makes may be used with prior approval.

Payment shall be made on **Sqm** basis.

**Item No. 141 : Providing and fixing M.S. grills of required pattern to wooden frames of windows etc. with M.S. flats at required spacings and frame around, square or round bars with round headed bolts and nuts or by screws (A) Plain Grill including Primer Coat and two coats of oil paint as directed by engineer in charge.**

The work shall be executed as per the specification of "**Item No. 10.100.(A) Page No. 75**" of **attached**

**Building Specification Booklet.**

face of the frame strips.

#### **3.0. Mode of measurements & payment**

**3.1.** No payment shall be made for weight of screws, bolts nuts etc. only weight of grill shall be paid.

**3.2.** The rate shall be for a unit of one **kg**.

**Item No. 142 : P & L 24" x 24" vitrified 8 mm thick tile flooring over 20 mm (average) base of cement mortar 1:6 ( 1 cement: 6 coarse sand) on new surface or fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with color cement slurry including finished with flush pointing & cleaning the surface etc. complete for antiskit**

### **1.0. Materials**

Water shall conform to M-1 Cement mortar shall conform to M-11 White glazed tiles shall conform to M-55

### **2.5. Workmanship**

#### **2.6. Preparation of Surface:**

In case of brick masonry wall, the joints shall be raked out to a depth of least 15 mm. while the masonry is being laid. In case of concrete wall the surface shall be chiseled and roughed with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

#### **2.7. Laying ;**

2.7.1. The wall surface shall be covered with 10 mm. thick plaster of cement mortar 1:3 mix and allowed to harden. The plaster shall be roughened with wire brushes both way. The back of tiles shall be floated with grey cement slurry set and edges with white cement slurry in bedding mortar. The tiles shall be gently tapped in position on after the other keeping the joints as thin as possible. Top of skirting or dedo shall be truly horizontal and the joints vertical or as per required pattern.

2.7.2. Risers of steps, skirting and dedo shall rest on top of treads or flooring. Where full size tiles cannot be fixed, They shall be cut to the required size and the edges be smoothened.

2.7.3. The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

- **Mode of measurements and payment**

- The rate shall include the cost of all materials and labour required for various operations described above. Risers of steps: skirting and dedo shall be measured in square meters, length and height shall be measured along the finished face of the skirting or dedo including curves, where special such as covers. internal and external angles, etc., used. The length and height shall be measured correct to the centimeter except in case of risers and skirting where height shall be measured

correct to 3 mm . The rate shall be for a unit of one sq. meter

**Item No. 143 : Providing and laying Vitrified tiles 8 to 10 mm thick in skirting risers of steps and dedo on 10 mm thick cement plaster 1:3 (1-cement : 3-coarse sand) and jointed with white cement slurry.**

The work shall be executed as per specification of Item No. 9 except the work is for **Providing and laying Vitrified tiles 8 to 10 mm thick in skirting risers of steps and dedo on 10 mm thick cement plaster 1:3 (1-cement : 3-coarse sand) and jointed with white cement slurry.**

Payment shall be made on **Sqm** basis.

**Item No. 144 : Providing and laying Polished Granite stone slab 18 mm (Average) thick for Doors / Windows Sill & Jambs Cladding as per design incl. full moulded round front edge in trade of steps laid on 20 mm thick cement mortar 1:6 (1 -cement : 6 coarse sand ) jointed with grey cement slurry including rubbing and polishing etc. complete for Doors / Windows Sill & Jambs Cladding.**

**1.0. Materials**

Water shall conform to M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M- 1). Marble stone slab 16 mm. thick shall conform to M-51.

**2.8. Workmanship**

**2.9. Dressing of slabs :**

Every stone shall be cut to required size and fine chisel dressed to give a smooth and even surface on all sides to full depth. A straight edge laid along the sides of the stone shall be fully in contact with it Chisel dressing shall also be done on top surface to remove any waviness. The sides and top surface of marble slabs shall be machine rubbed or table rubbed with coarse sand before using. All angles and edges of slabs shall be true, square and free from chipping.

2.2 The thickness of stone shall be 16 mm. The allowable tolerance shall be 2 mm. allowable. The 'tolerance shall + 5 mm. in length and breadth.

- **Bedding:**

Bedding of marble slabs shall either be lime mortar 1:1.5 (1 lime putty : 1.5 coarse sand) or cement mortar 1:6 (1 cement : 6 coarse sand) of average thickness 20 mm. thick as given in description of item. Minimum thickness at any place shall not be less than 10 mm.

- **Laying**

The surface of sub-grade shall be cleared, wetted and mopped. Mortar of specified mix and thickness shall then be spread on an area sufficient to receive one marble slab. The slab be washed clean before laying. It be laid on top pressed and tapped gently to bring it in level with other slabs. It shall then be lifted and a side. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows, or depressions. The mortar shall then be allowed to harden over this surface cement slurry or honey like consistency at 4.4 Kg. of cement per sq. meter. The edges of slabs already paved shall be buttered with gray cement. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly bedded in level with and close to the adjoining slab.

The joints shall be as fine as

possible. Surplus cement on the surface of the slab shall be removed. The slab fixed in the floor adjoining the walls shall enter not less than 10 mm. under the plaster skirting or dedo. The junction between the walls and floors shall be finished neatly. The finished surface shall be true to level and slopes as directed.

- **Curing :** The floor shall be cured for a minimum period of seven days.

- **Polishing and finishing:**

Unevenness at the meeting edges of slab shall be removed by fine chiseling. Finishing etc. shall be done as per relevant specifications of item No. 14.21 (A) or terrazzo tiles flooring except that cement slurry with/or without pigments shall not be applied on the surface before each polishing.

**3.2. Mode of measurements and payment**

**3.3. Marbles stone flooring with various kinds of marble shall be measured in sq. meter.** The length and breadth shall be measured between the finished face of skirting or dedo or wall plaster. No deduction shall be made nor extra shall be paid for any opening in the floor or area up to 0.05 sq. mt. Nothing extra shall be paid for laying stone at different levels in the same room. Treads and steps of stairs paved with marble stone slabs shall be also measured under flooring.

**3.2. The rate shall be for a unit of one sq. meter.**



**Item No. 145 : Providing and fixing PREMIUM QUALITY HUNG EWC:(WITH CROFT SOFT CLOSE SEAT COVER) SNOW WHITE COLOUR-535 X 360 X 335 MM with integral "P" and "S" trap including jointing the trap best quality brand including providing and fixing plastic seat cover for wash down WC with CP brass hinges and rubber buffers back plastic seat and including providing 12.50 Litres low level flushing cistern with a "P" air of CI or MS bracket with complete fitting such as lead valve Sipron 15mm dia brass ball valve with polythene float CP brass handle, unions and couplings for connection with inlet outlet and overflow pipes 40mm dia porcelain enamelled flush bend, including jet spray operated with necessary valve of best quality brand including cutting holes in walls and making good the same connecting the flush bend with cistern and closet vitreous china etc. complete.**

### **Specification: Providing & Fixing Premium Quality EWC with Flushing Cistern**

Providing and fixing **premium quality European Water Closet (EWC)** in **snow white colour**, of size approximately **535 x 360 x 335 mm**, with **integral “P” or “S” trap**, comprising the following:

#### **Closet & Seat Cover**

- Supplying and fixing **vitreous china EWC** of approved make and design.
- Providing and fixing **soft-close seat cover (Croft or equivalent)** made of high-quality plastic.
- Seat cover to be fixed with **CP brass hinges** and **rubber buffers**.

#### **Flushing System**

- Providing and fixing **12.5 litres capacity low-level flushing cistern**, complete with:
  - **CI/MS brackets** for wall mounting
  - **15 mm dia brass ball valve** with **polythene float**
  - Syphon mechanism
  - **CP brass handle/lever**
  - All internal fittings

#### **Pipes & Connections**

- Providing and fixing all necessary connections including:
  - **Flush pipe (40 mm dia porcelain enamelled flush bend)**
  - Inlet, outlet, and overflow pipes
  - Unions, couplings, and fittings

#### **Health Faucet (Jet Spray)**

- Providing and fixing **jet spray (health faucet)** with flexible hose and control valve of approved quality.

#### **Installation & Finishing**

- Fixing the closet properly aligned and connected to the drainage system.
- Jointing the trap with soil pipe using appropriate sealing material.
- Cutting holes in walls/floors where required and **making good the same** after installation.

## Workmanship

- The work includes **all materials, labour, tools, and accessories**, complete in all respects, as per:
  - Approved drawings
  - Specifications
  - Instructions of the **Engineer-in-Charge**
  - Payment shall be made on **Nos** basis.

**Item No. 146 : Providing and fixing PREMIUM QUALITY COUNTER WASH BASIN - CLIFF SNOW WHITE COLOUR-550 X 460 X 185 MM with single hole for pillar tap with C.I. or M.S. brackets painted white including cutting holes and making good the same with brass union and CP brass wall discharge pipe with flanges and cap of best quality brand , Waste Pipe for Wash basin C.P. 32 mm dia with fittings up to floor trap, 32mm dia CP brass waste coupline with CP chain and rubber plug, washer and CP brass cap complete in all respects including cutting and making good the walls RCC work as directed and making good the same etc. complete.**

### Specification: Providing & Fixing Premium Quality Counter Wash Basin

Providing and fixing **premium quality counter wash basin (Cliff or equivalent)** in **snow white colour**, of size approximately **550 x 460 x 185 mm**, comprising the following:

#### Wash Basin

- Supplying and fixing **vitreous china counter wash basin** with **single hole for pillar tap**, of approved make and design.

#### Supporting Brackets

- Providing and fixing **C.I. or M.S. brackets**, duly painted with **white enamel paint**, for proper support of the basin.

#### Waste & Drainage Fittings

- Providing and fixing:
  - **32 mm dia CP brass waste coupling** with **chain and rubber plug**
  - **CP brass waste pipe (32 mm dia)** with all fittings up to floor trap
  - **CP brass wall discharge pipe** with flanges and cap
  - Necessary **brass unions, washers, and fittings**

#### Installation & Finishing

- Fixing the basin in position with proper alignment and slope.
- **Cutting holes in walls/RCC** wherever required and **making good the same** after installation.
- Ensuring leak-proof joints and proper connection to drainage system.

## Workmanship

- The work includes **all materials, labour, tools, and accessories**, complete in all respects, as per:
  - Approved drawings
  - Specifications
  - Instructions of the **Engineer-in-Charge**

**Item No. 147 : Providing and fixing Urinal of approved quality including connection with trap and with integral longitudinal flush pipe.(A) Squatting plate pattern white earthenware 550mm x 300mm.**

**23.124.(A) Providing and fixing urinal of approved quality including connection with trap and with integral longitudinal flush pipe squatting plate pattern white earthenware 550 mm. x 300 mm.**

**1.0. Materials :** The squatting plate pattern, white glazed earthenware urinal of 550 mm x 300 mm shall conform to I.S. 771-1063. It shall be test India make.

**2.0. Workmanship**

**2.1.** The squatting plate urinal shall be fixed as directed.

**2.2.** The top edge of the squatting plate shall be flush with the finished floor level adjacent to it. It shall be embedded on a layer of 25 mm. thick cement mortar 1:8 (1 cement: 8 fine sand) laid over a bed of burnt brickbat cement 1:5 :10( 1 cement: 5 fine sand, 10 graded brick aggregate 20 mm. nominal size). There shall be 100 mm. dia.

glazed earthenware or vitreous china channel as specified with stop and outlet pieces suitably fixed in floor in cement

mortar 1:3 (1 cement: 3 coarse sand) and joint finished with white cement. The earthenware vitreous china shall discharge into 65 mm. C.P. brass outlet grating. The trap and fitting shall be fixed as directed.

**3.0. Mode or measurements and payment**

**3.1.** The rate includes .cost of all materials, tools and plants and labour required for satisfactory completion of this item.

**3.2.** The rate shall be for a unit of One number

**Item No. 148 : Providing and fixing screw down bib taps of following size.(B) Brass chromium plated screws down Bib Tap. (i) 15mm dia.**

**The work shall be executed as per the specification of "Item No. 23.92. (A) Page No. 170 " of Building Specification Booklet.**

**Payment shall be made on Nos basis.**

**Item No. 149 : Providing and fixing brass screw down stop tap.(A) 15mm dia.**

**The work shall be executed as per the specification of "Item No. 23.96 (A) Page No. 171 (15) of Building Specification Booklet.**

**Payment shall be made on Nos basis.**

**Item No. 150 : Providing and fixing chromium plated brass half turn flush cock of approved quality including fixing in pipe line etc. complete.(ii) 25mm dia.**

**The work shall be executed as per the specification of "Item No. 23.00 (A) Page No. 171 of Building Specification Booklet.**

**Payment shall be made on Nos basis.**

**Item No. 151 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Health Faucet Heavy duty with hook with fitting including labour, material, transportation etc. complete as directed by engineer in charge.**

**Specification: Providing & Fixing Premium Quality Health Faucet (Jet Spray)**

Providing and fixing **premium quality health faucet (jet spray)** of approved make (**Jaquar / Essco or equivalent**) with **heavy-duty construction**, comprising the following:

**Health Faucet Set**

- Supplying and fixing **CP (chrome plated) brass / high-quality ABS health faucet**, complete with:
  - Flexible hose pipe (1.0–1.5 m length)
  - Wall hook/holder
  - Trigger-operated spray mechanism

**Fittings & Accessories**

- Providing and fixing all required components, including:
  - Angle valve / stop cock (if required)
  - Wall flange
  - Connectors, nipples, and unions
  - Teflon tape and sealing materials

**Installation**

- Fixing the health faucet in proper position near WC.
- Connecting to water supply line ensuring **leak-proof joints**.
- Testing for smooth operation and proper water flow.

**Workmanship**

- The work includes **all materials, labour, transportation, tools, and accessories**, complete in all respects, as per:
  - Approved specifications
  - Instructions of the **Engineer-in-Charge**

**Short Tender Item (One-Line)**

Providing and fixing premium quality heavy-duty health faucet with hose, hook, and necessary fittings, complete in all respects as directed by Engineer-in-Charge.

**Approved Make List**

**Single-Line Clause**

Approved makes shall be **Jaquar / Essco / Hindware / Cera / Parryware** or equivalent as approved by the Engineer-in-Charge.

**CPWD / PWD Style Make List**

Sr. No.	Material	Approved Makes
1	Health Faucet (Jet Spray)	Jaquar / Essco / Hindware / Cera / Parryware
2	Angle Valve / Stop Cock	Jaquar / Essco / Hindware
3	Hose Pipe	Jaquar / Cera / Hindware
4	Accessories (Hook, Flange etc.)	Jaquar / Essco / Equivalent

**Item No. 152 : Providing and fixing 600mm x 120mm glass shelf with C.P. brass bracket and guard rail complete mixed to wooden plug with C.P. brass screws.**

**Materials:**

600mm x 120mm glass shelf with C.P. brass bracket and guard rail complete mixed to wooden plug with C.P. brass screws

**Labour:**

The Work of writing board shall be done with extreme finishing. The water proof ply wood shall be fixed as support to glass board and glass shall be fitted on top as directed by Engineer in charge. All the fixtures and fastenings shall be fitted at right angle and shall jointed with zero joint as directed by Engineer in charge. It shall be fixed on wall as directed by Engineer in charge.

**Mode of Payment:**

The Payment shall be made on Each basis of finished work done.

**item No. 153 : Providing and fixing standard extruded of aluminium section of size 63mm x 38.10mm x 1.2mm , @ Wt. 0.643 Kg/mt with colour Powder Coated aluminium frame for ventilation with 5 mm thick frosted glass as details etc complete for Ventilation.**

Specification for Providing & Fixing Aluminum Ventilation Window with Anodized Finish and Frosted Glass

*1. Aluminum Frame*

- 3 **Material:** Standard extruded aluminum alloy sections (conforming to IS: 733 / IS: 1285 or equivalent)
- 4 **Section Size:** 63 mm x 38.10 mm
- 5 **Wall Thickness:** 1.2 mm
- 6 **Weight:** 0.643 kg/running meter
- 7 **Finish:** Colour anodized finish (minimum anodizing thickness of 15 microns)
  - o *Colour:* As specified by Architect/Engineer (e.g., bronze, silver, natural, etc.)

*2. Glass*

- (f) **Type:** 5 mm thick **frosted (obscured) float glass**
  - Provides privacy and diffused light
  - Frosting method: Acid-etched or sandblasted (as specified)
- (g) **Make:** Saint-Gobain / Asahi / Modiguard or approved equivalent

*3. Fixing and Installation*

- 4 Aluminum frame to be cut, mitre-jointed, and mechanically fixed using cleats and screws.
- 5 Frame to be fixed in the prepared opening with stainless steel screws and nylon plugs, or suitable anchor fasteners.
- 6 Glass to be fixed with:
  - 6.0. EPDM rubber gaskets on all sides for weather sealing
  - 6.1. Aluminum glazing beads to secure glass
- 7 Gaps between wall and frame to be sealed with:
  - 7.0. Backer rod (if required)
  - 7.1. High-quality non-staining silicone sealant

*4. Accessories & Fittings*

- All necessary accessories like cleats, screws, gaskets, corner brackets, and sealants to be included.
- Optional: Aluminum louvers or perforated mesh for airflow (if part of design)

*5. Workmanship & Finishing*

- 2 Entire assembly to be installed square, plumb, and level.
- 3 Aluminum frame to be protected with removable plastic film until handover.
- 4 Final cleaning to ensure glass and frame are free from scratches, stains, or dust.

Component	Specification
<b>Aluminum Section</b>	63 mm x 38.10 mm x 1.2 mm
<b>Weight</b>	0.643 kg/running meter
<b>Finish</b>	Colour Anodized (min. 15 microns)
<b>Glass</b>	5 mm thick frosted float glass
<b>Application</b>	Fixed or ventilator-type window (non-operable)
<b>Fixing</b>	With EPDM gaskets, glazing beads & silicone sealant

Payment shall be made on Sqm. basis.

**Item No. 154 : Providing and fixing Fly proof S. S. wire gauge of I.S.I gauge designation 85 G. with wire of dia.0.56 mm to windows and celevating windows including Anodized Alluminum Section with allu. power coated fittings and fixture etc complete.**

Specification: Providing & Fixing Fly-Proof SS Wire Gauge with Aluminium Frame

Providing and fixing **fly-proof stainless steel wire gauge (mosquito mesh)** to windows and ventilators, comprising the following:

#### *Wire Mesh*

- Supplying and fixing **stainless steel wire mesh of ISI gauge designation 85 G**, made from **0.56 mm diameter wire**, ensuring:
  - Uniform mesh
  - Proper visibility and ventilation
  - Resistance to corrosion

#### *Frame*

- Providing and fixing **anodized / powder-coated aluminium sections** of approved size and profile, fabricated to required dimensions for windows and ventilators.

#### *Fittings & Accessories*

- Providing all necessary fittings and fixtures, including:
  - Aluminium clips / beading
  - Corner cleats
  - Rubber / PVC gaskets
  - Screws, fasteners, and fixing accessories

#### *Installation*

- Fixing the mesh securely within the aluminium frame.
- Properly installing the frame to window openings ensuring:
  - Tight fit
  - No gaps for insect entry
  - Easy removal (if required for cleaning)

- Aluminium sections to be **anodized or powder-coated** in approved colour and finish.

#### Workmanship

- The work includes **all materials, labour, tools, transportation**, complete in all respects, as per:
  - Approved drawings
  - Specifications
  - Instructions of the **Engineer-in-Charge**

**Payment shall be made on Sqm basis.**

### **Item No. 155 : Providing and fixing S.W. gully trap with C.I. grating brick masonry chamber and water tight C.I. cover with frame of 300mm x 300mm size (inside) with standard weight.(i) Square mouth traps. (A) 100mm x 100mm size P type.**

**1.0. Materials :** (t) Water shall conform to M-1. (2) Cement mortar of proportion 1:5 shall conform to M-11. (3) Burnt brick shall conform to M-15. (4} The S.W. Galley trap of 100 mm. x 100 mm. size shall confirm to .M-70.

#### **7.0. Workmanship**

**7.1.** Excavation for gully trap shall be done true to dimensions and levels as indicated on plans or as directed. The excavation work shall generally be done as per relevant specifications of item 4.0.0.of earth work.

#### **7.2. Fixing:**

7.2.1. The gully trap shall be fixed over cement concrete 1:5:10 (1 cement : 5 sand : 10 graded brick bats aggregate 40 mm nominal size) foundation. 650 square and 100 mm. thick The depth of top of concrete below the ground level shall be 675 mm. The jointing of gully outlet to the branch drain shall be done similar to jointing of S.W. pipe ac; described in item No. 24.1 (A) (Building Specification Booklet).

- Brick masonry chamber : After fixing and testing gully and branch drain, a brick masonry 300 x 330 mm. inside with bricks in CM 1:5 (1 cement : 5 sand) shall be built with a 100 mm. brick

work round OH; gully trap from the top of bed concrete up to ground level. The space between the chamber walls and the trap shall be filled with cement concrete 1:5:10. The upper portion of the chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1:3 (1 cement: 3 sand) finished with floating coat of neat cement. The corners and bottom of the chamber shall be rounded off so as to slope towards the grating.

- C.I. cover with frame 300 mm, x 300 mm. (inside) size shall then be fixed on the top of the brick masonry with C.c. 1:2:4 ( 1 lent : 2 coarse sand : 4 graded aggregate 20 mm. nominal size) 40 mm. thick and rendered smooth. The finished top of the cover shall be left about 40 mm. above the adjoining ground level so as to exclude the surface water from entering the gully trap.

#### **7.2. Mode of measurements & payment**

**7.3.** The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item as described above.

**3.2.** The rate shall be for a unit of one number basis.

**Item No. 156 : Constructing brick masonry chamber for underground C.I. Inspection chamber and bends with bricks having crushing strength not less than 35Kg/Cm<sup>2</sup> in C.M. 1:5 C.I. cover with frame (Light duty) 455mm x 610mm internal dimensions total weight of cover with frame to be not less than 38Kg. (Wt. of cover 23 Kg.) and Wt. of frame 15Kg. ) (R.C.C. top slabe with 1:2:4 mix (1- cement :2- coarse sand :4-graded stone aggregate 20mm size) foundation concrete 1:5:10 inside plaster 15mm thick with cement mortar 1:3 finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete.(i) Inside dimensions 455mmx 610mm and 450mm deep for single pipe line.**

**The work shall be executed as per the specification of "Item No. 24.44 (I) Page No. 184" of Building**

**Specification Booklet. Mode of Payment:**

**The rate shall be for unit of Number.**

**Item No. 157 : Providing and Fixing Heavy Duty Door Closer as directed by engineer in charge.**

Specification: Providing & Fixing Heavy Duty Door Closer

Providing and fixing **heavy-duty door closer** of approved make, suitable for the type, size, and weight of the door, comprising the following:

#### *Door Closer*

- Heavy-duty hydraulic / pneumatic door closer for smooth operation.
- Adjustable **closing speed, latching action, and back-check** as required.
- Suitable for **wooden, flush, aluminium, or metal doors**.

#### *Fittings & Accessories*

- All necessary fixing accessories such as:
  - Screws, brackets, and fasteners
  - End caps or cover plates
  - Arm and linkage

#### *Installation*

- Fixing the door closer in correct position and alignment on door and frame.
- Ensuring proper operation of door closure:
  - Smooth and controlled closing
  - No abrupt slamming
  - Proper latching at final stage

#### *Workmanship*

- The work includes **all materials, labour, tools, and accessories**, complete in all respects, as per:
  - Approved drawings
  - Instructions of the **Engineer-in-Charge**



Providing and fixing heavy-duty door closer with necessary fittings, brackets, and accessories, complete as directed by Engineer-in-Charge.

**Mode of Payment:**

The Payment shall be made on Number basis of finished work done.

**Item No. 158 : Structural steel work ( Confirming to IS 4923-1997) riveted, bolted or welded in builtup for all type sections, in framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete as per the structural designs and directions of Engineer in charge.**

The work shall be executed as per the specification of "Item No. 11.2. (A). Page No. 78 "of attached Building Specification Booklet.

Payment shall be made on Kg basis.

**Item No. 159 : Providing and laying cement concrete work 1:5:3 (1-Cement : 1.5- Coarse sand : 3- graded stone aggregates 20 mm nominal size) and curing complete including cost of formwork and reinforcement for reinforced concrete work in Superstructure Members.**

The work shall be executed as per the specification of "Item No. 5.8.2.. Page No. 47 "of attached Building Specification Booklet.

**2.0. Mode of measurement and payment**

**2.1.** The relevant specifications of item No, 5.8.1. shall be followed.

**2.2.** The rate shall be for one cubic meter.

**Item No. 160 : Providing and fixing wooden paneling made of framing the skeleton(plywood frame structure)with 18mm + 18mm thick MR grade plywood for vertical and horizontal plywood (patti) one side cover with 6mm thick MR grade plywood for grooving as per design.Fixing properly without any air gap and finishing with selected 1.00 mm thick laminate.Before installation,make hole/face plate for conduit pipes of electrical/networking cables with openable stud from partition Including all materials and labour etc.complete as per detail drawing and instruction of engineer-in charge.**

**Specification: Providing and Fixing Wooden Paneling**

Providing and fixing wooden paneling work comprising of a framed skeleton structure made out of plywood members. The framework shall consist of vertical and horizontal members using **18 mm + 18 mm thick MR grade plywood strips (patti)**, securely fixed to form a rigid base.

One side of the framework shall be covered with **6 mm thick MR grade plywood**, finished with grooving patterns as per the approved design and drawings.

The paneling shall be installed properly, ensuring **no air gaps** between the framework and the base surface. The visible surface shall be finished with **1.0 mm thick approved laminate**, of selected shade and make, applied uniformly.

The scope shall also include:

- Making necessary **cut-outs/holes and providing face plates** for electrical and networking conduit pipes.
- Providing **openable access panels (studs)** at required locations for maintenance.
- Ensuring proper alignment, leveling, and secure fixing of the paneling.

Providing and fixing wooden paneling comprising of a plywood framework made with **18 mm + 18 mm thick MR grade plywood members** for vertical and horizontal supports, forming a rigid skeleton structure. One face shall be covered with **6 mm thick MR grade plywood**, finished with grooves as per approved design.

The paneling shall be fixed properly without any air gaps and finished with **1.0 mm thick approved laminate** of selected shade and make.

The work shall include making necessary **cut-outs for electrical and networking conduits**, providing **openable access panels**, and fixing face plates wherever required.

Complete in all respects including all materials, labor, tools, and fixtures, as per drawings and instructions of the Engineer-in-Charge.

**Unit:** Sq. Mtr.

## **2. Short Tender Line Item**

Providing and fixing wooden paneling with MR grade plywood framework (18 mm + 18 mm), 6 mm backing plywood with grooves, finished with 1.0 mm laminate, including cut-outs for services and access panels, complete as per drawings and Engineer-in-Charge instructions.

## **3. Measurement Clause**

The wooden paneling shall be measured in **square meters (Sq. Mtr.)** of the finished surface area.

- No separate measurement shall be made for framework, grooves, laminate, or backing plywood.
- Openings for electrical boxes, conduits, and access panels shall **not be deducted**.
- Rate shall include all materials, labor, scaffolding, cutting, wastage, and fixing complete.

**Item No. 161 : Structural steel work ( Confirming to IS 4923-1997) riveted, bolted or welded in builtup for all type sections, in framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete including Consultancy Services ( Structural desing Proof checking of desing site Engineer Structure Engineer deployment etc. ) Etc Complete as directed by Engineer in charge .**

Specification: Structural Steel Work (Conforming to IS 4923:1997)

### Scope of Work

Providing and executing structural steel work conforming to **IS 4923:1997** for hollow sections and relevant IS codes for fabrication and erection. The work shall include fabrication, supply, erection, and finishing of steel structures for all types of sections used in framed structures.

## Materials

- Structural steel sections (hollow/rolled/built-up) conforming to **IS 4923:1997** and other applicable IS standards
- Welding electrodes, bolts, nuts, rivets of approved grade and make
- Approved steel primer (anti-corrosive)

## Fabrication

- Fabrication of built-up sections using plates, angles, channels, tubes, etc.
- All works shall include:
  - Cutting, bending, straightening
  - Drilling, punching, notching
  - Edge preparation and finishing
- Fabrication shall be done as per approved shop drawings

## Connections

- Connections may be:
  - Welded
  - Bolted (HSFG or conventional)
  - Riveted (if specified)
- All joints shall conform to relevant IS codes and approved designs

## Erection

- Hoisting and placing fabricated members at required locations
- Alignment, leveling, and fixing in position
- Temporary supports, scaffolding, and staging as required
- Ensuring structural stability during erection

## Surface Preparation & Painting

- Cleaning of steel surfaces (removal of rust, oil, grease, etc.)
- Application of one coat of approved steel primer before erection or as directed
- Additional coats (if required) shall be measured separately unless specified

## Consultancy & Engineering Services

The item shall include all necessary **consultancy and engineering services**, such as:

- Structural design and analysis
- Proof checking of design
- Preparation of detailed drawings and shop drawings
- Deployment of qualified personnel:
  - Structural Engineer
  - Site Engineer
- Site supervision and coordination

## Quality Control

- All works shall comply with relevant IS codes and standards
- Inspection and testing of materials and welds
- Dimensional checks and alignment verification
- Approval from Engineer-in-Charge at all stages

- Measured in **kilograms (kg)**

**Item No. 162 : Providing and fixing retro Reflective Hi Intensity Micro Prismatic Grade Board using 2mm Aluminum / 4mm ACP, angle iron 75 x 75 x 6mm. Descaling and degreasing the board as per requirement using epoxy reflective process by screen painting as directed etc. complete including transporting and fixing in C.C. 1:2:4 with necessary excavation curing etc. complete as per I.R.C. 67-2012 design. A warranty for 7 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (B) Class B Type-4 (MDR/ODR) retro reflective sheeting**

Specification: Providing and Fixing Retro Reflective Sign Board

Providing and fixing retro reflective sign boards made of **High Intensity Micro Prismatic Grade (HIP)** retro reflective sheeting of **Class B Type-IV**, conforming to **Indian Roads Congress guidelines (IRC:67-2012)**.

The sign board shall be fabricated using:

- **2 mm thick Aluminum sheet or 4 mm thick ACP sheet** as the base substrate
- Mounted on **MS angle iron frame of size 75 × 75 × 6 mm**

The surface shall be properly **descaled, degreased, and cleaned**, and the retro reflective sheeting shall be fixed using an approved **epoxy adhesive process**. The legend/symbols shall be applied using **screen printing method** as per approved design and specifications.

The board shall be transported to site and erected in position, including:

- Fixing on supports embedded in **Cement Concrete (1:2:4)** foundation
- Necessary **excavation, concreting, curing, and finishing**
- Proper alignment, leveling, and orientation as directed by the Engineer-in-Charge

The work shall be completed in all respects as per drawings and site instructions.

#### **Warranty Requirements:**

- Minimum **7-year warranty** for retro reflective sheeting from the original manufacturer
- Submission of **certified 3-year outdoor exposure test report** from an approved third-party laboratory

Applicable for **MDR/ODR roads (Class B roads)**.

#### **2. BOQ Item (Detailed)**

Providing and fixing retro reflective sign boards using High Intensity Micro Prismatic Grade (HIP) Class B Type-IV sheeting on 2 mm aluminum / 4 mm ACP sheet, supported on MS angle iron frame (75×75×6 mm), including surface preparation, epoxy fixing, screen printing, transportation, erection in CC (1:2:4) foundation with excavation, curing, and all materials and labor complete, as per IRC:67-2012 and Engineer-in-Charge instructions, including required warranty and test certificates.

**Unit:** Sq. Mtr. / Each (as specified)

### **3. Short Tender Line Item**

Providing and fixing HIP retro reflective sign boards (Class B Type-IV) on aluminum/ACP sheet with MS angle frame, including epoxy fixing, screen printing, erection in CC foundation, complete as per IRC:67-2012.

### **4. Measurement Clause**

The Payment shall be made on Sqmt basis.

**Item No. 163 : Excavation for foundation for depth from 1.5 m to 3.0 m including sorting out and stacking of useful materials and disposing off the excavated stuff up to 50 Meter lead.(B) Dense or Hard soil**

The work shall be executed as per the specification of "Item No. 4.0.0(B) Page No. 29 "of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 164 : Providing and laying cement concrete 1:4:8 (1- Cement : 4- Coarse sand : 8- Graded Brick bats aggregate 40mm normal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth**

The work shall be executed as per the specification of "Item No. 5.3.3(A) Page No. 38" of attached Building Specification Booklet.

Payment shall be made on **Cum** basis.

**Item No. 165 : Repairing to Door / Window including disassembling from frame, wroughting, providing patti, angles, replacing / repairing stoppers - aldrops - handles etc. for proper fixing in to frame hole etc. complete for smooth operation and proper utilization including assambeling and refixing of the same as directed by Engineer-in-charge.**

#### **1. Scope of Work**

This specification covers the **repair, disassembly, reassembly, and painting** of **wooden doors/windows**, including replacement of defective parts and ensuring smooth operation.

#### **2. Work Details**

##### **A. Disassembly & Inspection**

1. Carefully **dismantle the door/window from the frame** without causing damage.
2. Inspect for **damaged, worn-out, or misaligned components** such as hinges, handles, stoppers, AL drops, etc.
3. Identify any **woodwork issues** such as cracks, warping, or termite damage.

##### **B. Repair & Replacement**

4. **Roughing (reshaping/smoothing) the wooden surface** where necessary.
5. **Providing & fixing Patti, angles, or reinforcements** to strengthen the structure.
6. **Replacing or repairing defective hardware** such as:
  - o **Hinges, handles, stoppers, AL drops, latches, locks.**
  - o Adjusting for proper alignment and smooth movement.

7. **Ensuring a proper fit** into the frame hole for smooth operation.

##### **C. Reassembly & Fixing**

8. **Assemble and refax the door/window back into the frame.**
9. Check for **proper alignment and ease of operation** (opening/closing smoothly).

#### **D. Painting & Finishing**

10. **Cleaning the surface** thoroughly, removing dust, dirt, and old flakes.

11. **Applying one coat of enamel paint** over the previously painted surface: ○ Ensuring **an even shade** without streaks.

○ **Excluding primer coat** (if already primed).

12. **Final inspection** to ensure smooth operation and aesthetic finish.

### **3. Materials & Tools Required**

- **Patti, angles, screws, nails, adhesives** for reinforcements.
- **Hardware fittings:** Hinges, handles, stoppers, AL drops, locks.
- **Enamel paint (approved brand & shade)** for uniform finish.
- **Sandpaper, wire brush, putty** for surface preparation.
- **Paintbrushes/rollers** for smooth application.

### **4. Measurement & Payment**

Payment shall be made on **Sqm** basis.

**Item No. 166 : Providing and laying Synroof High bond ecentromentric premium quality acrylic coating as a water proofing membrance finished which consists of a coat of bitumine primer & 80 CSM membrane in sunk slab , Terrace Slab with ultraviolet resistance and working upto any height etc. complete as directed by Engineer in charge**

#### **1. Detailed Specification**

Specification: Providing and Laying Acrylic Waterproofing Membrane System

Providing and laying **Synroof High Bond Eccentric Premium Quality Acrylic Coating** as a waterproofing membrane system over **sunken slabs and terrace slabs**, including surface preparation and complete treatment.

The system shall consist of:

- Application of **bituminous primer coat** on the prepared surface
- Laying of **80 GSM CSM (Composite Reinforcement Mat) membrane** embedded within the coating system
- Application of **high bond acrylic coating** in multiple coats to achieve a seamless waterproof membrane

The finished surface shall be **ultraviolet (UV) resistant**, durable, and suitable for exposed terrace conditions.

The work shall include:

- Proper **surface cleaning, preparation, and crack filling if required**
- Uniform application ensuring **complete bonding without air gaps**
- Treatment of **junctions, corners, and outlets**
- Application up to **any height and at all levels**

The system shall be applied strictly as per manufacturer specifications and **instructions of the Engineer-in-Charge**, ensuring complete waterproofing performance.

All materials, labor, tools, tackles, scaffolding, curing, and incidental works required for proper completion of the job shall be included.

## 2. BOQ Item (Detailed)

Providing and laying Synroof High Bond premium acrylic waterproofing coating over terrace/sunken slab, including bituminous primer, 80 GSM CSM reinforcement membrane, multiple acrylic coats, UV resistant finish, surface preparation, and all materials and labor complete as per manufacturer specifications and Engineer-in-Charge instructions.

**Unit:** Sq. Mtr.

## 3. Short Tender Line Item

Providing and applying acrylic waterproofing membrane with primer and CSM reinforcement on terrace/sunken slab, complete with UV resistant finish.

## 4. Measurement Clause

- Measured in **square meters (Sq. Mtr.)** of treated surface area
- No deduction for small openings, outlets, or pipes
- No separate measurement for primer, reinforcement, or multiple coats

**Item No. 167 : Painting two coats on new steel and other metal surface with enamel paint, brushing, interior to give an even shade including cleaning the surface an even shade including cleanicn the surface of all dirt, dust and other foreign matter.**

**The work shall be executed as per the specification** of "Item No. 18.57 Page No. 136" of Building Specification Booklet.

**The rate shall be for a unit of one sq. meter.**

**Item No. 168 : Providing 15mm thick cement plaster in single coat on Rough (Similar)side of single or half brick walls for interior plastering upto first Floor and finished even and smooth in (ii) Cement mortar 1:4 (1-cement :4-sand)**

### 1.0. Materials

1.1. Water shall conform to M-1. The cement mortar of proportion 1:3 shall conform to M-13.

### 2.0. Workmanship

#### 2.1. Scaffolding:

Wooden bullies, bamboos, planks, trestles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

#### 2.2. Preparation of back-ground :

2.2.1. The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be toughened by wire brushing if it is not hard and by

hacking if it is hard. In case of concrete surface, if a chemical retarded has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the readers if left on the surface. Trimming of projections on brick/concrete surfaces where necessary shall be carried out to get an even surface.

2.2.2. Raking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before

carrying out the plaster work.

2.2.3. The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such area shall be moistened again.

2.2.4. For external plaster, the pestring operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be-started wherever the building frame and cladding work are ready

and the temporary supports of the ceiling resting on the wall of the floor have been removed. Ceiling plaster shall

be completed before starting plaster to walls.



### **2.3. Application of plaster:**

**2.3.1.** The plaster about 15x15 cms. shall be first applied horizontally and vertically at not more than 2 meters intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small

upward and sideways movements at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a smooth or a sandy granular texture is required Excessive troweling or overworking

the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Hounding or chamfering, corners, arises junctions etc. shall be carried out

with proper templates to be size required.

**2.3.2.** Cement plaster shall be used within half an hour after addition of water. And mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

**2.3.3.** In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically, when recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together.

Plastering

work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises.

It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

**2.3.4.** Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and

as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of

building in hot air or dry weather shall be prevented by hanging matting or gunny bags oh the outside of the plaster

and keeping them wet.

### **3.0. Mode of measurements & payment**

**3.1.** The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

**3.2.** All plastering shall be measured in square meters unless otherwise specified. Length breadth or height shall be measured correct to a centimetre.

**3.3.** Thickness of the plaster shall be exclusive of he thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.

**3.4.** This item includes plastering up to floor two level.

**3.5.** The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices

if any shall be deducted.

**3.6.** Soffits of stairs shall be measured as plastering on ceilings, following soffits shall be measured separately.

**3.7.** For jambs, soffits, sills etc. for openings not exceeding 0.5 sq. met each in area for ends of joints beams, posts, girders, steps etc. not exceeding 0.5 sq. mt each in area and for openings exceeding 0.5. sq. mt and not exceeding 3.00 sq. mt. in each area deductions and additions shall be made in the following manners.

(a) No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq. mt each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, for finish to plaster around ends of joints, beams posts etc.

(b) Deduction for openings exceeding 0.5 sq. mt but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for ravels, jambs, soffits, sills etc. of these openings, (i) When both faces of all wall are

plastered with same plaster, deduction shall be made for one face only, (ii) When two faces of wall are plastered with different types of plasters or if one face is plastered and the other pointed, deductions shall be made from the

plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other

side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and / or pointing as the case may be.

**3.8.** For openings having door frames equal to or projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.

**3.9.** tn case of openings of area above 3 sq. mt. each, deduction shall be made for openings but jambs, soffits sand sills shall be measured.

**3.10.** The rate shall be for a unit of One sq. meter.



**Item No. 169 :** Distempering with dry distemper of approved brand and manufacture (Three coats) and of required shade on wall surfaces of given an even shade, over and including a priming coat of whitening after thoroughly brooming the surface free from mortar dropping and other foreign matter on Ceiling.

The work shall be executed as per the specification of "Item No. 18.44. shall be followed. Page No. 132 "of attached Building Specification Booklet.

**.Mode of measurements and payment**

.The relevant specifications of item No. 18.11 shall be followed.

.The rate shall be for a unit of One sq. meter.

**Item No. 170 :** Providing and fixing wsh down water closet (European type, W.C. Pan) with integral P or S trap including jointing the trap with soil pipe in Cement Mortar 1:1 (1-Cement : 1-fine sand) (Seal and cover to be measured and paid for separately)(A) vitreous China Pattern :(i) in white colour

The work shall be executed as per the specification of "Item No. 23.111.(A)(I) Page No. 163 Item No. 23.113 (A) Page No. 165 Item No. 23.114 Page No. 165 Item No. 23.96 (A) + 23.00.4 Page No. 171" of attached Building Specification Booklet.

**Payment shall be made on Nos basis.**

**Item No. 171 :** Providing and fixing washbasin with single hole for pillar tap with .I. or M.S. brackets painted white including sutting holes and making good the same but excluding fittings.(A) Vitreous China:(ii) Flat Back washbasin 550 mm x v 400mm size. (i) In white colour.

The work shall be executed as per the specification of "Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 172 :** Providing and fixing extruded aluminum window having extruded aluminum Colour Powder Coated section frame main outer size 127mm x 38.10mm x 1.35mm ,@ Wt.1.384 Kg/mt,horizontal Four track member size122.20mm x 31.75mm x 1.10mm @ Wt. 1.205 Kg/mt,vertical member of size 122.20mm x 31.75mm x 1.50mm ,@ Wt. 1.398 Kg/mt with sliding shutters of horizontal member size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt,vertical member of size 40mm x 18mm x 1.29mm @ wt.of 0.456Kg/mt,@ with 5 mm thick transparent bronze colour tinted float glass with powder coated aluminum fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc complete for window.

Specification: Providing & Fixing Extruded Aluminium Sliding Window

Providing and fixing extruded aluminium sliding window system fabricated from powder-coated aluminium sections of approved colour and make, including all necessary fittings, fixtures, and accessories, complete in all respects as per drawings and specifications.

**Frame:**

- Outer frame made from extruded aluminium section of size **127 mm × 38.10 mm × 1.35 mm thickness**, weighing **1.384 kg/m**
- Horizontal four-track member of size **122.20 mm × 31.75 mm × 1.10 mm thickness**, weighing **1.205 kg/m**
- Vertical member of size **122.20 mm × 31.75 mm × 1.50 mm thickness**, weighing **1.398 kg/m**

**Shutters:**

- Sliding shutters fabricated from:
  - Horizontal member: **40 mm × 18 mm × 1.29 mm thickness**, weighing **0.456 kg/m**
  - Vertical member: **40 mm × 18 mm × 1.29 mm thickness**, weighing **0.456 kg/m**

**Glazing:**

- **5 mm thick transparent bronze tinted float glass**, fixed to shutters using approved aluminium glazing clips and **transparent silicone sealant**

**Finish:**

- All aluminium sections to be **powder coated** in approved colour and finish

**Hardware & Accessories:**

- Aluminium rollers, locks, handles, weather strips, and other necessary fittings of approved make
- Proper sealing to ensure smooth operation and weather resistance

**Execution:**

- Window to be installed in position, aligned, and fixed securely
- All joints sealed and finished neatly
- Complete as per architectural drawings and site instructions

Payment shall be made on **Sqm** basis.

**Item No. 173 : Providing PVC Flexible Waste Pipe 60cm Long and 25mm Dia. for Urinal as Directed by Engineer in charge.**

Specification: Providing & Fixing PVC Flexible Waste Pipe for Urinal

Providing and fixing **PVC flexible waste pipe** of approved quality, **60 cm length and 25 mm diameter**, suitable for urinal connection, including all necessary fittings, jointing, and accessories, complete in all respects as directed by the Engineer-in-Charge.

**Material:**

- Flexible PVC waste pipe of **25 mm dia and 60 cm length**
- Of approved make and quality

**Fixing:**

- Connected securely between urinal outlet and waste line
- Properly tightened to ensure leak-proof joints

**Accessories:**

- Including necessary couplings, nuts, washers, and clamps (if required)

### Workmanship:

- Installation to be neat, aligned, and leak-proof
- Completed as per site requirements and instructions of Engineer-in-Charge

Here is the **BOQ format with CPWD-style wording and rate analysis structure** for your item:

#### BOQ Item Description (CPWD Style)

**Item No.:** \_\_\_\_

#### Description:

Providing and fixing PVC flexible waste pipe of **25 mm diameter and 600 mm length** for urinal, of approved quality and make, including all necessary fittings such as couplings, nuts, washers, clamps, etc., complete in all respects as per the direction of the Engineer-in-Charge.

**Unit:** Each

**Quantity:** \_\_\_\_

**Rate (₹):** \_\_\_\_

**Amount (₹):** \_\_\_\_

#### Rate Analysis (Basic Structure)

#### 1. Materials:

- PVC Flexible Waste Pipe (25 mm dia, 600 mm long) – 1 No.
- Accessories (nuts, washers, clamps, etc.) – L.S.

#### 2. Labour:

- Plumber – \_\_\_\_ day
- Helper – \_\_\_\_ day

#### 3. T&P (Tools & Plants):

- Included in labour (L.S.)

#### 4. Overheads & Contractor's Profit:

- Add @ 10–15% (as per standard practice)
- Payment shall be made on Nos basis.

**Item No. 174 : Carrying out plinth treatment to post construction /existing structure by spraying chemical solution for termite control treatment including labour and material consistent with I.S.I specification. Using Chlordane and Chlorpyrifos 20 EC. As Per 6131\_paret-II Concentration Weight one percent is recommended i.e one litre 20 EC chemical emulsion with 19 liter give 1 %concentration inclusive of one litre chemical emulsion application at the rate of 5 Litre chemical / Sqm of surface is recommended as per I.S**

Detailed Specification for Anti-Termite Treatment (Post-Construction / Existing Structure – Plinth Treatment)

Providing and carrying out **post-construction anti-termite treatment** to existing structures at plinth level by **spraying chemical emulsion** uniformly over the surface, including all labour, materials, tools, and equipment, in accordance with relevant **IS standards (IS 6313 Part II)**.

The treatment shall be carried out using approved chemicals such as:

**Chlordane** (*where permitted*) or

**Chlorpyrifos 20% EC**

preparation of Chemical Emulsion

The chemical emulsion shall be prepared to achieve a **1% concentration**, as recommended in IS 6313 (Part II):

Mix **1 litre of Chlorpyrifos 20% EC** with **19 litres of water**

This produces **20 litres of 1% emulsion**

Application Rate

The emulsion shall be applied at the rate of:

**5 litres per square metre (5 L/m<sup>2</sup>)** of treated surface

Application shall be done by **spraying evenly** to ensure proper penetration into soil and contact with structural surfaces.

Scope of Work Includes

Surface preparation before treatment

Drilling (if required) for proper chemical penetration

Spraying/injecting chemical emulsion

Sealing of treated holes (if drilled)

All labour, materials, tools, and safety measures

**The rate shall be for a unit of One sq. meter.**

**Item No. 175 : Providing and fixing powder coated aluminum standard extruded section glazed type Door of 63.50 mm x 38.10 mm x 1.95 mm or as specified drawing or as directed having Top & bottom panel of 5 mm thick coloured float glass at top including all fixtures and fastenings like glazing clips, rubber gasket, hardware like handel , tower bolt , 6 liver mortise lock etc. and labour etc. complete as directed by engineer in charge.**

Detailed Specification for Powder Coated Aluminium Glazed Door

Providing and fixing **powder coated aluminium glazed door** made from standard extruded aluminium sections, conforming to relevant IS specifications, with frame and shutter members of size **63.50 mm × 38.10 mm × 1.95 mm thick** or as per approved drawings and as directed by the Engineer-in-Charge.

#### Material & Construction

- Aluminium sections shall be of **standard extruded quality**, free from defects, and properly fabricated.
- The aluminium sections shall be **powder coated** with approved colour and thickness as per specifications.
- The door shutter shall be of **glazed type**, consisting of:
  - Top panel:** 5 mm thick coloured float glass
  - Bottom panel:** 5 mm thick coloured float glass (or as specified)

#### Fixtures & Fittings

The work shall include providing and fixing all necessary accessories such as:

- Aluminium **glazing clips**
- EPDM / rubber gaskets** for proper sealing
- Suitable **handles**
- Tower bolts**
- 6 lever mortise lock** with keys
- Screws, cleats, and all required fastenings

#### Workmanship

- The sections shall be **accurately cut, machined, and assembled** to ensure proper alignment and smooth operation.
- Glass panels shall be securely fixed using **gaskets and clips** to ensure safety and durability.
- The door shall be installed **true to line, level, and plumb**.
- All joints shall be properly sealed and finished neatly.

#### Scope Includes

- Supply of all materials
- Fabrication and assembly
- Fixing and installation at site
- All labour, tools, tackles, and accessories
- Complete in all respects as directed by the Engineer-in-Charge

#### Measurement

- The door shall be measured in **square metres (m<sup>2</sup>)** for finished work.

**Item No. 176 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Wall Hung European type W.C. Pan with in Built Jet, PP Soft closed seat cover, Hinges, Dual Flush cistern, fixing accessory etc. complete of size 365 x 525 x 400 mm or 375 x 520 x 400 mm including cutting cutting holes and making goods the same including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 177 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Table top wash basin of 565 x 425 x 140 mm with hole for pillar tap with C.I. or M.S. brackets painted white including cutting cutting holes and making goods the same include C.P. brass waste and waste pipes including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No. 23.127 Page No. 167 Item No. 23.135 (A) Page No. 168 Item No. 23.136 (A) Page No. 168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 178 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Urinal of size 355 x 340 x 535 mm connecting with PVC waste pipe, Trap etc. complete including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No 23.122.(A) Page No.172 Item No.23.135.(A) Page No.168 Item No.23.136.(A) Page No.168" of attached Building Specification Booklet.

Payment shall be made on **Nos** basis.

**Item No. 179 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Bib cock with wall flange including labour, material, transportation etc. complete as directed by engineer in charge.**

The work shall be executed as per the specification of "Item No. 2.1 Page No. 170 Bib cock of Building Specification Booklet.

Payment shall be made on **No.** basis.

**Item No. 180 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Angular stop cock with wall flange including labour, material, transportation etc. complete as directed by engineer in charge.**

Specification Details:

- **Make & Brand:** Jaquar / ESSCO or equivalent (approved by the engineer in charge).
- **Type: Angular Stop Cock** (with wall flange).
- **Material:** The stop cock should be made of **C.P. brass** (Chromium-plated brass) or an equivalent high-quality corrosion-resistant material, ensuring long-lasting durability.
- **Design:**
  - The stop cock must feature an **angular design** for easy installation and operation.
  - It should come with an attached **wall flange** to facilitate secure fitting to the wall and ensure the device is stable and properly fixed.
- **Size:** The size should be as per standard dimensions suitable for typical domestic or commercial plumbing systems.

Installation Details:

- **Labour:** The specification covers all labour charges for installing the angular stop cock, including the fitting of the wall flange and ensuring it is securely connected to the plumbing system.
- **Materials:** The cost of the angular stop cock, wall flange, and any other necessary components for installation is included.
- **Transportation:** The cost of transporting the materials to the site should be included in the scope of work.
- **The rate shall be for a unit of one number basis.**

**Item No. 181 : Providing & Fixing Premium quality approved make like Jaquar / ESSCO or equivalent Flush Valve dual flow 40 mm size having Concealed body with Exposed shut of provision and 100 mm square plate ( 3 to 6 liter per flushing ) including labour, material, transportation etc. complete as directed by engineer in charge.**

Specification Details:

- **Make & Brand:** Jaquar / ESSCO or equivalent (approved by the engineer in charge).
- **Type:** Flush Valve with **dual flow** (40 mm size).
- **Size:** 40 mm (standard size).
- **Construction:**
  - **Body:** Made of **canceled body** (likely refers to the material or specific design for durability).
  - **Shut-off Provision:** The flush valve must include an exposed shut-off provision for control and maintenance.
  - **Plate:** The flush valve will come with a **100 mm square plate** to cover the mechanism and provide a clean, functional design.
- **Flush Flow Rate:** The flush valve should support a **dual flow** system, with options of **3 to 6 liters per flush** (a water-saving design).
- **Installation Scope:**
  - The flush valve must be properly installed as per the site conditions.
  - The plate should be mounted securely and aligned with the existing plumbing fixtures.
- **Labour:** All labour charges for installation, including fitting the flush valve and ensuring it works correctly, should be covered.
- **Materials:** The specification covers all material costs, including the flush valve, plate, plumbing connections, and required components.
- **Transportation:** The transportation of all required materials to the site should be included in the scope of work.
- **Completion:** The job should be completed as per the direction of the engineer in charge, ensuring proper functionality and installation as per standard guidelines.

**The rate shall be for a unit of one number.**

**Item No. 182 :** Providing and fixing eco-friendly light weight calcium silicate false ceiling tiles having Tegular edge & 15 mm Thick Densified edges on the Tile Periphery for Extra Strength The Light weight calcium silicate ceiling tiles shall have , light reflection 85% non-combustible as per B.S. 476 part IV, 100% humidity resistance and also having thermal conductivity  $0.043^{\circ} \text{ w/m KC}$  for the best thermal Insulation . The Light weight calcium Silicate tile shall be of approved texture Fine fissured/ Spintone/Cosmos having NRC value of 0.5 & Globe having NRC value of 0.75 NRC or equivalent of size 595 X 595 mm to be laid on true horizontal levels suspended inter locking metal grid of hot dipped galvanized steel sections (galvanizing @120 grams per sqm including both side) consisting of main 'T' runner suitably spaced at joints to get required length and size of 24X38mm made from 0.30 mm thick (minimum) sheet, 1200mm centre to centre, and cross 'T' of size 24X28mm made out of 0.33mm (Minimum) sheet spaced 1200mm along spaced between main 'T' at 600mm centre to centre to form a grid of 1200X600mm and secondary cross 'T' of length 600mm and size 24x28mm made of 0.30 mm thick (Minimum) sheet to be interlocked at middle of the 1200X600mm panel to form grid of size 600X600mm resting on periphery walls/partitions on a perimeter wall angle pre-coated steel of size (24X24X3000mm made of 0.40mm thick (minimum) sheet with the help of rawl plugs at 450mm centre to centre with 25mm long dry wall screws @ 230mm interval and laying 15mm thick Densified edges light weight calcium silicate ceiling tiles of approved texture (Fine Fissured/Cosmos/Spintone) in the grid including, cutting /making opening for services like diffusers,

#### 1. Scope of Work

Providing and fixing eco-friendly lightweight calcium silicate false ceiling tiles in a suspended grid system, including all materials, cutting, framing, and openings for services (like diffusers, lights, etc.).

#### 2. Ceiling Tile Specifications

**Material:** Lightweight Calcium Silicate (Eco-friendly)

**Edge Type:** Tegular edge with **densified edges (15 mm thick)** for extra strength

**Tile Size:** 595 mm × 595 mm

**Thickness:** 15 mm

#### **Surface Finish Options:**

Fine Fissured

Spintone

Cosmos

Globe

#### **Performance Properties:**

Light Reflection: **85%**

Fire Rating: **Non-combustible (as per B.S. 476 Part IV)**

Humidity Resistance: **100% RH**

Thermal Conductivity:  **$0.043 \text{ W/m}\cdot\text{K}$**  (good thermal insulation)

Noise Reduction Coefficient (NRC):

Fine Fissured / Spintone / Cosmos: **0.50**

Globe: **0.75**



### 3. Suspension Grid System

Material:

Hot-dip galvanized steel sections

Galvanizing: **120 g/m<sup>2</sup> (both sides)**

Main Runner (Main 'T'):

Size: **24 mm × 38 mm**

Thickness: **0.30 mm (min.)**

Spacing: **1200 mm c/c**

Cross Tee (Primary Cross 'T'):

Size: **24 mm × 28 mm**

Thickness: **0.33 mm (min.)**

Spacing:

1200 mm along main runner

600 mm c/c between main runners

Secondary Cross Tee:

Length: **600 mm**

Size: **24 mm × 28 mm**

Thickness: **0.30 mm (min.)**

Purpose: Forms **600 × 600 mm grid**

### 4. Grid Layout

Primary Grid: **1200 × 600 mm**

Final Grid (after secondary tees): **600 × 600 mm**

### 5. Perimeter System

**Wall Angle Size:** 24 × 24 × 3000 mm

**Thickness:** 0.40 mm (min.)

**Material:** Pre-coated steel

Fixing Details:

Fixed to walls/partitions using **rawl plugs @ 450 mm c/c**

Fastened with **25 mm drywall screws @ 230 mm intervals**

### 6. Installation Requirements

Ceiling to be installed at **true horizontal level**

Proper suspension system with interlocking grid

Tiles to be neatly placed and aligned

**Cut-outs/openings** to be made for:

Light fixtures

Diffusers

AC vents

Other services

### 7. Additional Notes

All components must be of approved make and quality

Edges must be densified for durability

Work includes complete installation with finishing

Ensure clean and damage-free installation

Payment shall be made on **Sqm** basis.

**Item No. 183 : Distempering (Two coats) with oil bound distemper of approved brand and manufacture and of required shade on wall surfaces to give an even shade, over and including a priming coat with distemper primer of approved brand and manufacture after thoroughly brushing the surface free from mortar dropping and other foreign matter and also including preparing the surface even and sand papered smooth.**

**1.0. Materials**

**1.1.** Oil bound washable distemper and primer shall be of approved brand and manufacture. The distemper shall be of required colour and shade and the same shall conform to I.S. : 428-1969.

**2.0. Workmanship**

**2.1. Scaffolding**

Where scaffolding is required, it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be distempered. A properly secured and well tied suspended platform (Joola) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary.

**2.2. Preparation of surface :**

**2.2.1.** The undecorated surface to be distempered shall be thoroughly brushed from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for at least

2 months before applications of distemper.

**2.2.2.** All unnecessary nails shall be removed. Pitting in plaster shall be made good with plaster again with a fine grade sand paper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is allowed. The surface affected by moulds, moss, fungi, algae lichens, efflorescence etc. shall be treated in accordance with I.S; 2395 (Part 01) 1966. Before applying

distempering, any unevenness shall be made good by applying putty made of plaster of paris mixed with water on entire surface including filling up the undulation and then sand papering the same after it is dry.

**2.3. Priming coat :**

**2.3.1.** A priming coat of distemper primer of approved manufacture and shade shall be applied over the papered surface in case of new work on undecorated surface. If the distemper priming is done after the wall surface dries completely, the distemper primer shall be applied.

**2.3.2.** Application of primer shall be done as under: The primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards.

This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush

marks. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied.

**2.3.3.** Oil bound distemper is not recommended to be applied within six months of the completion of wall plaster.

**2.4. Preparation of oil bound distemper :**

**2.4.1.** The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer only. Sufficient quantity of distemper required for a day's work shall be prepared.

**2.5. Application of Distemper coat:**

**2.5.1.** For undecorated surfaces, after the primer coat is dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out priming coat. All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of at least 24 hours between consecutive coats to permit proper drying of the preceding coat. The finished surface shall be even and free from patches, brush marks, distemper drops etc.

**2.5.2.** Sufficient quantity of distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot be completed on the same day.

**2.5.3.** 15 cm. double bristled distemper brush shall be used. After day's work brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall

not be used on the work.

**2.6. Protective measurements :** The surfaces of doors, windows, floors, articles of furniture etc. and such other parts of the buildings as are not to be distempered shall be protected from being splashed upon. Such surfaces shall be cleaned of distemper splashes if any.

**3.0. Mode of measurements and payment**

**3.1.** Priming coat of distemper primer, scraping of surface spoiled by struck roots, removal of oil and grease spots, treatment for infraction of effloresces., mould moss, fungi, algae and lichen and patch repairs to plaster shall

be included in this item for which nothing extra shall be paid.

**3.2.** All the work shall be measured net in the decimal system as in place subject to the following limits unless otherwise stated hereinafter:

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 sq. m. All work shall be made for ends of joints, beams, posts etc., and openings, not exceeding 0.5 sq.mt. each and no addition shall be made for reveals,

jambs, soffits, sills etc. of these openings not for finish around ends of joints, beams, posts etc.

**3.3.** Deductions of opening exceeding 0.5 sq.m. but not exceeding 3 sq. m. each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings :

(a) When both the faces of wall are provided with same finish, deductions shall be made for one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveals is less than that of the other side but no deduction shall be made on

the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more

than that on untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.

**3.4.** In case of opening of area exceeding 3 sq. m. each deduction shall be made for openings but jambs, sills and soffits shall be measured.

**3.5.** No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.

**3.6.** Item includes removing nails, making good holes, patches with materials similar in composition of distemper.

**3.7.** The rate includes cost of all materials, labours, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handing , unloading, storing work etc

**2.8. The rate shall be for a unit of one sq. meter**

**Item No. 184 : Box cutting the road surface to proper slope and camber for making a base for road work including removing the excavated stuff and depositing on the road side slope as directed up to 50Mt.lead.**

The sub grade / sub base / base to receive the water bound macadam course shall be prepared to the specified grade and camber and made of dust and other extraneous materials. Any nets of soft places shall be corrected in on approved manner and rolled until firm.

Cutting shall be paid on cross section area as established by the longitudinal level and cross sections for this purpose. The work shall be started after the initial longitudinal section of the ground and cross sections are taken and recorded.

The final surface shall confirm to proper profile, camber and super elevation etc. as directed by the Engineer. The earthwork shall be paid on sectional measurements, cross sectional etc. taken.

No allowance or payments shall be made for materials excavated prior to the taking of level by the Engineer.

The rate is inclusive of cutting in all soil and murrum including removal of all shrubs, jungle cutting, cutting stuff in slopes, side drain bank etc. complete.

This item also includes the clearing the sides and demarking the line as per requirement and cutting out the existing tress on the road side, not extra payment will be paid for.

At the time of preparing final bill, the road formation in embankment and cutting shall have be perfect condition true to grade, camber and side slope duly dressed and damages due to rain cuts etc. during entire working period shall have to be done by the contractor.

The work taken in length shall be completed in all respects viz. width, grades, camber, side drains, side slopes etc. and measurements for incomplete work shall not be taken otherwise.

**1.0 Mode of Measurement & Payment:**

The unit rate box cutting shall include the cost of all materials, tools and plant required for excavation in all type of soils in grade and camber, line and levels and finishing as per direction of the Engineer-in-charge, excavation and all other incidental expenses for producing item of box cutting of specified breadth and depth and grade to complete the item or its components as shown on the drawings and according to these specifications.

The box cutting shall be measured for its cross-section area and compacting volumes in cubic meters by the method of average areas.

The rate will be made on Cubic Meter basis of the finished work.

**Item No. 185 : Providing and Fixing Pre-cast concrete kerb stone of gray cement based concrete block 30cm length 30cm height and 15cm thick of M200 grade concret as per approved design and including excavation for fixing in proper line and level filling the joint with CM 1:3 (1cement:3fine sand) etc complete.**

Providing and Fixing Concrete Block Work (M200 Grade)

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**1. Scope of Work**

Providing and fixing precast cement concrete blocks of specified size in position, including excavation, alignment, jointing, and all incidental works complete as per approved design and direction of the Engineer-in-Charge.

**2. Material Specifications**

**Concrete Blocks**

Size: 300 mm (Length) × 300 mm (Height) × 150 mm (Thickness)

Grade: M200 (as per approved mix design)

Type: Precast solid concrete blocks

Finish: Uniform shape, smooth surface, free from cracks and defects

**Cement Mortar for Joints**

Proportion: 1:3 (1 cement : 3 fine sand)

Sand: Clean, well-graded fine sand

Cement: OPC/PPC of approved make

**3. Excavation**

Excavation to required depth and width as per design

Bottom surface to be properly leveled and compacted

Any loose soil to be removed before placing blocks

**4. Laying and Fixing**

Blocks shall be laid in proper line, level, and alignment

Laid over prepared bed as per drawing/specification

Vertical and horizontal joints to be properly aligned

Each block to be placed firmly without gaps

**5. Jointing**

Joints to be filled with cement mortar 1:3

Joint thickness: approximately 10–12 mm or as specified

Excess mortar to be neatly finished

Joints to be fully packed to ensure strength and durability

**6. Finishing**

Surface to be finished true and even

All joints properly struck and finished

Curing to be done for minimum 7 days

**7. Workmanship**

Work to be executed as per approved drawings

Proper alignment and verticality to be maintained

Damaged blocks shall not be used

All tools, plants, and labour included

**8. Measurement**

The Payment Shall be Rmt Basis,

**Item No. 186 : Providing and Fixing 18 mm thick Plywood SHUTTER for Cupboard or Below platform shutter using 18mm thick TERMITE PROOF PLY (GREENPLY OR EQUIVALENT) WITH BOTH SIDE LAMINATE & WOODEN BEADING ON PERIPHERY, Exposed face should be covered with 1.0 mm thick laminate of approved quality and pattern, colour, texture the rest of the inside surfaces, shelves etc, shall be finished with 0.80 mm thick Sqm white laminates of approved make, wooden framing shall be used including around framing of 19 mm X 12 mm. teak wood member at all borders and in the centre where ever, all the sides of the shutter should be covered with teakwood battens and provided with necessary framing, best quality SS channels for sliding, SS finished hinges, handles, magnet, deadlock etc. as approved and directed by Engineer-In-Charge**

Providing and Fixing 18 mm Thick Plywood Shutter (Cupboard / Below Platform)

#### 1. Scope of Work

Providing and fixing cupboard or below-platform shutters made from 18 mm thick termite-proof plywood, finished with laminates on both sides, including wooden framing, beading, hardware fittings, and all accessories, complete as per approved design and direction of the Engineer-in-Charge.

#### 2. Material Specifications

##### Plywood

Thickness: 18 mm

Type: Termite-proof, BWR/BWP grade

Make: Greenply or equivalent approved make

##### Laminate Finish

External (Exposed Face):

1.0 mm thick decorative laminate

Approved colour, pattern, and texture

Internal Surfaces (inside faces, shelves, etc.):

0.80 mm thick white laminate

#### 3. Wooden Framing & Beading

Perimeter Framing:

Teak wood sections of size 19 mm × 12 mm

Additional Framing:

Provided at centre/stiffeners wherever required

Edge Treatment:

All edges of shutter to be covered with teak wood battens

Smooth finish with proper polishing

Beading:

Wooden beading provided along periphery for strength and finish

#### 4. Shutter Construction

Shutter to be factory-made or site-fabricated as per design

Proper bonding of laminate using approved adhesive

Surface to be even, smooth, and free from bubbles or defects

Edges to be neatly finished and polished

#### 5. Hardware & Fittings

Sliding System (if applicable):

Best quality SS (stainless steel) channels

Hinges:

SS finished heavy-duty hinges

Handles:

SS handles of approved design

Magnet Catchers:

For proper closing

Locking Arrangement:

Deadlock of approved make

All fittings to be of approved quality and make

#### 6. Fixing & Installation

Shutters to be fixed in proper alignment, level, and plumb

Smooth opening and closing ensured

All screws, fasteners, and fixtures included

Installation as per drawings and site requirements

#### 7. Workmanship

High-quality finish with no visible defects

Proper alignment of laminate grains and patterns

All edges sealed and protected

Damaged or warped materials shall not be used

#### 8. Measurement

Measured in square meters

**Item No. 187 : Providing and laying cement concrete 1:3:6 (1-Cement: 3- coarse sand: 6- hand broken stone aggregates 40 mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth.**

The work shall be executed as per the specification of "Item No. 5.3.2.(B) Page No. 39 " of Building Specification Booklet.

The rate shall be for a unit or one cubic meter.

**Item No. 188 : Providing and fixing pre-cast Rubber Dye / steel Dye inter locking concrete block 60mm thick with grade of concrete M 300 pneumatic compressed vibrated mechanically and as per approved design Confirming to IS 15658 2006 including 35 mm Sand layer for levelling and filling the joint with sand in proper line and level as per guidelines of IRC SP 63-2018 etc. Complete**

**1.0. Materials :**

Corrugated G.I. sheets shall conform to M-23.

**2.0. Workmanship**

2.1. Spacing of purlins : One purline shall be provided at the ridge and one at the eaves. The spacing of other purlins for 0.8 mm. thick G.I. sheets shall not exceed 1.80 meters. The purline shall coincide with the centre line of the end lap. The ridge purlins shall be placed in such a way that the ridges can be fixed properly. The portion overhanging the wall support shall not be more than one fourth of the 'spacing of purlins.

2.2. The top surfaces of the purlins shall be painted before the sheets are fixed over them. Embedded portions of purlins shall be finished with tow coats of coal-tar.

**2.3. Laying of sheets :**

2.3.1. The sheets shall be laid in purlins to a true plane with the line of corrugations truly parallel or normal to the sides of area to be covered. The sheets shall not generally be built into gables and parapets. They shall be bent up along their side edges close to the wall, and the junction shall be protected by suitable flushing or by projecting drip course.

2.3.2 The laps at end shall be provided 150 mm. minimum for roof slopes 1 in 2 (1 vertical : two horizontal) and steeper but 200 mm. shall be provided for flatter slopes than those above. The side lap shall be provided two ridges of corrugations at each side.

2.3.3. The sheets shall be cut to the dimensions or the shape of the roof either along their lengths or their width or in slant across the line of corrugations at hips and valleys. The sheets shall be cut carefully with a straight edge and chisel to give straight finish. The sheets shall be laid such that the laps are turned away from the usual direction of local heavy rain.

**2.3.4. Fixing of sheets :**

2.3.4.1. Sheets shall be fixed to the purlins or other roof members such as hips or valley rafter etc. with 1J' or 1L' galvanized hook bolts, and galvanized nuts 8 mm. dia. with bitumen limpet washers and G.I. washers. Limpet washers with white lead shall be used. Length of hook bolt shall be varied to suit the site requirement. Bolts shall be sufficiently long so that after fixing the project above the top of their nuts by not less than 12 mm the grip of 1J' or 1L' book bolts on the sides of purlins shall not be less than 25 mm. There shall be minimum of three hooks bolts placed at the ridge of corrugations in each sheet in every purlin and their spacing shall not exceed 300 mm. Coach screw shall not be used for fixing the sheets to purlin, where the slopes of roof are not less than 2.1/2 degree (1 vertical and 2.1/2 horizontal). Sheets shall be jointed together at the side laps by galvanized iron boils and nuts 25 mm. x 6 mm. size each bolt with a bitumen and G.I. limpet washer filled with white lead. Where the overlaps at the sides extend to two corrugations, these bolts shall be placed zigzag over lapping corrugations, so that the ends of the overlapping sheets are drawn tightly towards each other. The spacing of same bolts shall not exceed 600 mm. along each of the staggered rows.



2.3.5. Holes for all bolts shall be drilled and not punched in the ridges of the corrugations from the under side, while the sheets are on the ground. The holes in the sheets shall be at least 50 mm. from the edge. ' Sheets drilled wrongly shall be rejected. The holes in the washers shall be of the exact diameter of the hook bolts or the beam bolts. The nuts shall be tightened from above to give a leak-proof root

3.0. Mode of measurements and payment

3.1. The measurements of the C.G.L sheet roof shall be taken for finished work in superficial area in general plane (not girthed on the roof). The laps between the C.G.I. Sheets both at their ends and along the side edges shall not be measured. The overlaps of C.G.I, sheets over the valley piece and their under lap under the ridge, hip and flashing piece shall be included in the measurements.

3.2. No deductions in measurements shall be made for openings for chimney stacks, sky light etc., of area up to 0.40 sq. mt. nor extra be paid for labour in cutting and for wastage etc. in forming such openings.

3.3. The rate of roof shall include the cost of all materials and labour involved in all operations described above. The rate also includes the cost of provision, erection and removal of the scaffolding, benching, ladders, templates and tools required for the proper execution and erection of the work. The rate includes the cost of purlins, rafters and trusses.

3.4. **The rate shall be for a unit of one sq. meter.**

**Item No. 189 : Applying two coats of two component dampproof coating of approved brand and manufacture on undecorated wall surface to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand papered smooth as per instruction of Engineer In Charge**

1. **Manufacturer's Specifications:** Start by exploring products from reputable manufacturers that specialize in crystalline waterproofing.

2. **Certification Check:** Look for products that have certifications from recognized bodies or organizations such as ICC-ES, Ecolabel programs, or the FDA.

3. **Technical Data:** Ensure the product's technical data sheets provide information on crystalline waterproofing, SEM photographs, testing reports, and compliance with relevant standards (IS, ASTM, etc.).

**Evaluation Criteria:**

1. **Compliance:** Verify if the product meets the standards you've listed (IS 2645, IS 516, ASTM C 1202-05, FDA standards, etc.).

2. **Testing Reports:** Request testing reports from manufacturers for SEM photographs, permeability tests, chloride penetration reduction, and chemical erosion resistance.

1. **Certifications:** Check if the product is listed in ICC-ES EVALUATION REPORT INDEX and holds green certifications from recognized Ecolabel programs.

2. **Application Method:** Ensure the product's application aligns with the approved method of waterproofing accepted by the Engineer in Charge.

**Procurement Process:**

1. **Tender Process:** During the tender process, request comprehensive documentation from potential suppliers, including test reports, certifications, and compliance details.

2. **Review and Approval:** Evaluate the documentation provided by suppliers thoroughly, seeking clarification or additional information as needed.

3. **Contractual Agreement:** Once you've selected a product and supplier, establish a contractual agreement outlining the scope of work, compliance standards, and warranties.

4. The rate shall be for a unit of one sq. meter.

**Item No. 190 : Providing and erecting Approved make Ceiling fan with double ball bearing ISI mark with condenser A.C. 230V.50 c/s.1200 mm. sweep complete, canopy erected on existing hook or clamp with earthing. (Make shall be approved by Engineer in charge)**

Ceiling Fan Supply & Installation Specification

**Description:**

Providing and erecting an approved make ceiling fan complete with all accessories and proper installation.

Technical Details:

- **Type:** Ceiling fan with **double ball bearing**
- **Certification:** Must be **ISI marked**
- **Voltage:** **A.C. 230 V**
- **Frequency:** **50 cycles/second (Hz)**
- **Sweep Size:** **1200 mm**
- **Motor:** Suitable for continuous operation with inbuilt condenser

Installation Requirements:

- Fan shall be **erected on existing hook or clamp**
- **Canopy** must be properly fixed to cover mounting
- Proper **earthing** must be provided for safety
- Installation should ensure **stable, vibration-free operation**

Approval Clause:

- The **make/brand** of the ceiling fan must be **approved by the Engineer-in-Charge** before installation

Scope Includes:

- Supply of ceiling fan
- Necessary accessories (downrod, canopy, shackle, blades, etc.)
- Installation and fixing
- Electrical connections including earthing
- Testing and commissioning

## 1. BOQ (Bill of Quantities) Format

Sr. No.	Description	Unit	Qty	Rate (₹)	Amount (₹)
1	Providing and erecting approved make ceiling fan, 1200 mm sweep, double ball bearing, ISI marked, suitable for A.C. 230V, 50 Hz supply, complete with condenser, canopy, blades, downrod, etc., including fixing on existing hook/clamp and earthing, as approved by Engineer-in-Charge	Each	—	—	—

## 2. Tender Specification Wording

### Item Description:

Providing, supplying, and installing approved make ceiling fan of 1200 mm sweep, double ball bearing type, conforming to ISI standards, suitable for operation on A.C. 230 volts, 50 Hz supply, complete with all standard accessories such as blades, downrod, shackle, canopy, and condenser.

The fan shall be installed on the existing ceiling hook or clamp. Proper earthing shall be provided as per standard electrical safety norms. The fan shall be tested for smooth and noise-free operation after installation.

The make of the fan shall be subject to prior approval of the Engineer-in-Charge.

Payment shall be made on Each basis.

### **Item No. 191 : Supplying & erecting approved make low noise decorative exhaust fan having square frame ABS body with inbuilt lowers & square frame. 200mm with 1350RPM Cat. II**

#### Specification Details

##### **1. Type of Fan:**

Decorative exhaust fan

Low noise type

##### **2. Make & Approval:**

Only approved make (brand/manufacturer must be specified by the client or authority)

##### **3. Construction & Material:**

**Body:** ABS (Acrylonitrile Butadiene Styrene) – durable, lightweight, corrosion-resistant plastic

**Frame:** Square frame

**Blower:** Inbuilt low-noise blower (designed for minimal operational sound)

**Frame Style:** Square frame (likely for wall or ceiling mounting compatibility)

##### **4. Size & Performance:**

**Impeller/Diameter:** 200 mm

**Speed:** 1350 RPM (rotations per minute)

**Category:** II (this could refer to fan classification per BIS/IS standards, usually related to airflow and pressure)

##### **5. Installation:**

Supplied and erected (installed) at site

Ensure proper alignment and mounting

Electrical connection per manufacturer instructions and local electrical standards

##### **6. Operational Features:**

Low noise operation (suitable for residential or office environments)

Decorative design (aesthetic integration with interiors)

Efficient airflow while minimizing vibration

##### **7. Standards & Compliance:**

Should comply with relevant Indian Standard (IS) or international standards for safety, noise, and efficiency

Proper certification or approval from the concerned authority required

Payment shall be made on Each basis.

**Item No. 192 : Providing following type of Modular Type Accessories mounted with PVC /metallic/Wooden box, single mounting base frame covered with textured/metallic/white front plate, modules erected with necessary connections as per site situation directed by Engineer In charge. (5) Electronic hum Free steps EME Fan regulator, Cat.III**

Specification Details

**1. Type of Device:**

- **Modular Type Accessories** (switches, regulators, sockets, etc.)
- Specifically: **Electronic Hum-Free Fan Regulator**

**2. Make & Category:**

- **Approved Make** (as specified or directed by Engineer In-Charge)
- **Category:** III (Cat. III usually refers to electrical accessories designed for higher duty or enhanced specifications as per IS/IEC standards)

**3. Construction & Materials:**

- **Mounting Box:** Can be PVC, Metallic, or Wooden, depending on site requirement
- **Mounting Base Frame:** Single modular frame
- **Front Plate:** Textured, metallic, or white finish as per architectural aesthetics
- **Modules:** Each module is prewired and mounted on the frame

**4. Functionality:**

- **Fan Regulator:** Electronic, hum-free operation
- **Control Steps:** 5 steps (allowing smooth speed control of ceiling or wall-mounted fans)
- **Noise Performance:** Designed to minimize audible hum during operation

**5. Installation / Erection:**

- Modules to be erected and connected as per site conditions
- Connections to follow directions of **Engineer-In-Charge**
- Proper alignment of modules and secure mounting on wall/box

**6. Standards & Compliance:**

- Should comply with IS/IEC standards for safety, voltage rating, and modular accessories
- Proper certification or approval may be required

**7. Operational Features:**

- Smooth electronic control of fan speed
- Durable construction, resistant to environmental wear
- Compatible with modular wiring systems

Payment shall be made on Each basis.

**Item No. 193 : Providing & erecting Switch board for Computer or electric apparatus consisting of following modular type accessories mounted with PVC /Metallic concealed /open box with single mounting base frame covered with textured/metallic/white front plate,modules erected with necessary connections as directed**

**1 no. 6A/16A universal plug-switch combined.**

**3 nos. 6A Switch**

**3 nos. 6A 5 pin Plug**

**For Modular Type Accessories, Catill**

Specification Details

1. Type of Device:

Modular Switch Board for computers or electrical apparatus.

Designed to accommodate multiple modular accessories with concealed or open wiring.

2. Make & Category:

Approved make (as specified by Engineer-In-Charge).

Category: III (Cat III) – Modular type electrical accessories as per IS/IEC standards for durability and safety.

3. Construction & Materials:

Mounting Box:

Material: PVC or metallic, suitable for concealed or open mounting.

Mounting Frame: Single modular base frame.

Front Plate: Textured, metallic, or white finish to match aesthetics.

Modules: Erected and connected as per site conditions and instructions.

4. Accessories & Configuration:

Item	Quantity	Specification
Universal Plug-Switch combined	1	6A/16A, modular type
Switch	3	6A, modular type
5-Pin Plug	3	6A, modular type

5. Installation / Erection:

Proper erection of modular accessories on the base frame.

Connections to be completed as per site situation and Engineer-In-Charge instructions.

Concealed/open wiring done as per approved electrical standards.

Ensure all accessories are aligned flush with front plate.

6. Operational Features:

Provides safe and convenient access to electrical power for computers or apparatus.

Modular design allows easy replacement or future expansion.

Durable and aesthetically suitable for offices or labs.

#### 7. Standards & Compliance:

All accessories and switchboards should comply with relevant IS/IEC standards.

Proper testing and certification may be required before handover.

Payment shall be made on Each basis.

**Item No. 194 : Supplying and erecting LED indoor fittings with LEDs of wattage 0.2 Watt to 0.5 Watt assembled on single MCPCB, with housing used as a heat sink shall be made of thick sheet Steel conforming to IS: 513/CRCA/aluminium die cast powder coated and high U.V. & corrosion resistance with diffuser with company mark/name 160V to 270V, Power Factor more than 0.95, THD < 15%, CCT 3000 K to 6500K, Luminaire efficacy > 85 lumens/watt, LED driver efficiency > 85% (fitting required LM-79 & LM-80 Certificates) (NOTE: Below description have shown ranges of Wattage capacity of LED fittings. The Engineer incharge may select any wattage capacity between the ranges shown.) (A) Tube Light with integral driver (iii) 18-20 Watts, Surge -2KV, IP-20, conventional 4 feet, Cat-III**

Here's a detailed breakdown of the specification you provided for the **LED indoor fittings (Tube Light)**:

#### Specification Details

##### 1. Type of Fixture:

- **LED Indoor Fitting** – Tube light with **integral driver**.
- Conventional 4 feet length.

##### 2. LED Details:

- **LED Wattage per Chip:** 0.2 W to 0.5 W, assembled on **single MCPCB (Metal Core Printed Circuit Board)**.
- **Color Correlated Temperature (CCT):** 3000 K to 6500 K (warm to cool white).
- **Luminaire Efficacy:** > 85 lumens/W.
- **LED Driver Efficiency:** > 85%.
- **Power Factor:** > 0.95.
- **Total Harmonic Distortion (THD):** < 15%.
- **Certificates:** LM-79 & LM-80 compliance required.

##### 3. Housing / Construction:

- **Material:** Thick sheet steel conforming to **IS: 513**, or **CRCA**, or **Aluminium die-cast, powder-coated**.
- **Heat Management:** Housing acts as a heat sink.
- **Durability:** High UV and corrosion resistance.
- **Diffuser:** Included, with company mark/name.

#### **4. Electrical & Protection:**

- **Input Voltage Range:** 160V to 270V AC.
- **Surge Protection:** 2 kV.
- **Ingress Protection (IP Rating):** IP-20 (suitable for indoor use).

#### **5. Wattage Range & Selection:**

- **Fitting Wattage:** 18–20 W.
- The **Engineer-In-Charge** may select any wattage within this range depending on site requirements.

#### **6. Installation / Erection:**

- Supplied and erected at site.
- Proper electrical connection and alignment as per site and manufacturer's instructions.
- Ensuring the diffuser and housing are securely fixed.

#### **7. Category & Standard:**

- **Category:** III (Cat-III – as per electrical accessory classification).
- Must comply with IS/IEC standards for indoor LED luminaires.

1. Payment shall be made on Each basis.