

## **Item Wise SPECIFICATIONS :-**

### **Name of Work Repairing/Renovation of Office Building and Compoundwall of Tantrik Talim Kendra at lilapar road, Morbi, Dist.Morbi**

**Item No. 4 : Removing and scraping of old deteriorated plaster of any thickness from wall /RCC member including stacking of serviceable material and disposal of unserviceable from site of work with all lead & lift**

- 1.0 The scraping of plaster shall be properly carried out as directed by Engineer-in-Charge in any thickness of plaster and at any height of floor.
- 1.1 Necessary propping, shoring and under pinning shall be provided for the safety of the adjoining work of property before scraping is taken up and the work shall be carried out in such a way that no damages to other property.
- 1.2 Scraping shall be commenced in a systematic manner. The scraping material shall be properly stacked as directed.
- 1.3 On completion of work, the site shall be cleared of all debris, rubbish and cleaned as directed.
- 2.0 MODE OF MEASUREMENTS AND PAYMENTS
- 2.1 Measurements of all work except hidden work shall be taken before scraping under this item.
- 2.2 The rate shall include all cost of all labour & materials involved and took use in scraping including scaffolding. the rate shall be included the disposing of unserviceable materials with all lead and lift.
- 2.3 The rate shall be a unit of one **Sq. Metre**.

**Item No. 5 :- Repairs and Re-fitting of doors, window and Cup Board shutters by providing necessary non teak wood member, glass/Acrylic sheet and necessary hardware fitting and including touching the new member by matching existing oil painting, shed etc. complete as directed including all cost of labour and materials.**

[A] General :-

The work shall be carried out in General Relevant Specification of P.W.D. hand book Volume No. I & II and Relevant I.S.S. as per N.B.C. of Indian unless and otherwise specification for all different items under this item.

[B] Materials :-

As per Annexure-II Schedule of fixture & fastening for door, windows, Cupboard, ventilators, work rotes and cup board code of practice-13 (B) Page No. 166.

The window must be repair by using glass/acrylic sheet which is preferred by engineer in charge

[C] Workmanship :-

The work shall be carried out in line and level. Repairing and refixing the doors & window including necessary fixtures & fastening as per site instruction and site engineer. Repairing work shall be opened from frame verticals and horizontal rails, fixture & fastening. As above work refixing for doors, windows, ventilators and C.B. shutter necessary provided fixture & fastening including all labour and materials necessary required wood work and welding work shall be provided without any extra payment.

[D] Mode of Measurement :-

- (i) The item shall be paid on **Sqmt.** basis with clear distance including frame & shutters.
- (ii) The Rate includes cost of materials, labour, finishing etc. complete. No extra payment shall be for making grooves in the frames & refixing in partition.

**Item No. 7 :: Providing and Laying W.B.M., in one layers, using B.T.M.C. metal of size 40mm to 63mm in layers including 16% stone screening 13.2mm size and 8% stone dust as filler, including spreading, watering and consolidation by vibratory roller as per MoRTH specifications etc. complete as directed by Engineer-in-charge.**

#### **404.1. Scope**

**404.1.1.** This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bonding together with screening, binding material where necessary and water laid on a properly prepared subgrade/ sub-base/ base or existing pavement, as the case may be and finished in accordance with the requirements of these Specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved plans or as directed by the Engineer.

**404.1.2.** It is, however, not desirable to lay water bound macadam on an existing thin black topped surface without providing adequate drainage facility for water that would get accumulated at the interface of existing bituminous surface and water bound macadam.

#### **404.2. Materials**

**404.2.1. Coarse aggregates :** Coarse aggregates shall be Black Trape crushed or stone. Materials Black Trape crushed stone shall be used in sub-base courses only. If crushed gravel/ shingle is used, not less than 90 per cent by weight of the gravel/ shingle pieces retained on 4.75 mm sieve shall have at least two fractured faces. The aggregates shall conform to the physical requirements set forth in Table 400-6. The type and size range of the aggregate shall be specified in the Contract or shall be as specified by the Engineer. If the water absorption value of the coarse aggregate is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS : 2386 (Part 5).

**404.2.2. Crushed or broken stone:** The crushed or broken stone shall be hard, durable and free from excess flat, elongated, soft and disintegrated particles, dirt and other deleterious material.

**TABLE 400-6. PHYSICAL REQUIREMENTS OF COARSE AGGREGATES FOR WATER BOUND MACADAM FOR SUB-BASE/BASE COURSES**

Test		Test Method	Requirements
1	* Los Angeles	IS:2386	40 per cent (Max)
	Abrasion value	(Part-4)	
	Or		
	* Aggregate	IS:2386	30 per cent (Max)
	Impact value	(Part-4) or	
		IS:5640**	
2	Combined		
	Flakiness and	IS:2386	30 per cent (Max)
	Elongation	(Part-1)	
	Indices (Total)		
	***		

\* Aggregate may satisfy requirements of either of the two tests.

\*\* Aggregates like brick metal, kankar, laterite etc. which get softened in presence of water shall be tested for Impact value under wet conditions in accordance with IS: 5640.

\*\*\* The requirement of flakiness index and elongation index shall be enforced only in the case of crushed broken stone and crushed slag.

**404.2.5. Grading requirement of coarse aggregates :** The coarse aggregates shall conform to one of the Gradings given in Table 400-7 as specified, provided, however, the use of Grading No.1 shall be restricted to sub-base courses only.

**TABLE 400-7. GRADING REQUIREMENTS OF COARSE AGGREGATES**

Grading No.	Size Range	IS Sieve Designation	Per cent by weight passing
1.	63mm to 40mm	90mm	100
		63mm	0-100
		53mm	25-75
		40mm	0-15
		22.4mm	0-5

Note : The compacted thickness for a layer with Grading 1 shall be 100 mm while for layer with other Gradings i.e. 2 & 3, it shall be 75 mm.

**404.2.6. Screenings:** Screenings to fill voids in the coarse aggregate shall generally consist of the same material as the coarse aggregate. However, where permitted, predominantly non-plastic material such as moorum or gravel (other than rounded river borne material) may be used for this purpose provided liquid limit and plasticity index of such material are below 20 and 6 respectively and fraction passing 75 micron sieve does not exceed 10 per cent.

Screenings shall conform to the grading set forth in Table 400-8. The consolidated details of quantity of screenings required for various grades of stone aggregates are given in Table 400-9. The table also gives the quantities of materials (loose) required for 10 m<sup>2</sup> for sub-base/base compacted thickness of 100/75 mm.

The use of screenings shall be omitted in the case of soft aggregates such as brick metal, kankar, laterites, etc. as they are likely to get crushed to a certain extent under rollers.

TABLE 400-8. GRADING FOR SCREENINGS

Grading Classification	Size of Screenings	IS Sieve Designation	Per cent by weight passing the IS Sieve
A	13.2mm	13.2	100
		11.2mm	95-100
		5.6mm	15-35
		180 Microm	0-10

**TABLE 400-9. APPROXIMATE QUANTITIES OF COARSE**

**AGGREGATES AND SCREENINGS REQUIRED FOR 100/75 MM  
COMPACTED THICKNESS OF WATER BOUND MACADAM  
(WBM) SLB-BASE/BASK COURSE FOR 10M<sup>2</sup> AREA**

Classificati on	Size Range	Compacted thickness	Lose Qty.	Screenings			
				Stone Screening		Crushable type such as Moorum or Gravel	
				Grading Classificati on & Size	For. WHM Sub-base/ base course (Loose quantity)	Grading Classificati on & Size	Loose Qty.
Grading 2	63 mm to 40mm	75 mm	0.91 to 1.07 m <sup>3</sup>	Type A 13.2mm	0.12 to 0.15 m <sup>3</sup>	-do	0.22 to 0.24 m <sup>3</sup>

**404.2.7. Binding material :** Binding material to be used for water bound macadam as a filler material meant for preventing ravelling, shall comprise of a suitable material approved by the Engineer having a Plasticity Index(PI) value of less than 6 as determined in accordance with IS: 2720 (Part-5).

The quantity of binding material where it is to be used, will depend on the type of screenings. Generally, the quantity required for 75 mm compacted thickness of water bound macadam will be  $0.06-0.09 \text{ m}^3/10\text{m}^2$  and  $0.08-0.10\text{m}^3/10\text{m}^2$  for 100 mm compacted thickness.

The above mentioned quantities should be taken as a guide only, for estimation of quantities for construction etc.

Application of binding materials may not be necessary when the screenings used are of crushable type such as moorum or gravel.

### **404.3. Construction Operations**

**404.3.1. Preparation of base:** The surface of the subgrade/ sub-base/base to receive the water bound macadam course shall be prepared to the specified lines and crossfall (camber) and made free of dust and other extraneous material. Any ruts or soft yielding places shall be corrected in an approved manner and rolled until firm surface is obtained if necessary by sprinkling water. Any sub-base/base/surface irregularities, where predominant, shall be made good by providing appropriate type of profile corrective course (levelling course) to Clause 501 of these Specifications.

As far as possible, laying water bound macadam course over an existing thick bituminous layer may be avoided since it will cause problems of internal drainage of the pavement at the interface of two courses. It is desirable to completely pick out the existing thin bituminous wearing course where water bound macadam is proposed to be laid over it. However, where the intensity of rain is low and the interface drainage facility is efficient, water bound macadam can be laid over the existing thin bituminous surface by cutting 50 mm x 50 mm furrows at an angle of 45 degrees to the centre line of the pavement at one metre intervals in the existing road. The directions and depth of furrows shall be such that they provide adequate bondage and also serve to drain water to the existing granular base course beneath the existing thin bituminous surface.

**404.3.2. Inverted choke :** If water bound macadam is to be laid directly over the subgrade, without any other intervening pavement course, a 25 mm course of screenings (Grading B) or coarse sand shall be spread on the prepared subgrade before application of the aggregates is taken up. In case of a fine sand or silty or clayey subgrade, it is advisable to lay 100 mm insulating layer of screening or coarse sand on top of Fine grained soil, the gradation of which will depend upon whether it is intended to act as a drainage layer as well. As a preferred alternative to inverted choke, appropriate geosynthetics performing functions of separation and drainage may be used over the prepared subgrade as directed by the Engineer. Section 700 shall be applicable for use of geosynthetics.

**404.3.3. Spreading coarse aggregates :** The coarse aggregates shall be spread uniformly and evenly upon the prepared subgrade/sub-base/ base to proper profile by using templates placed

across the road about 6 m apart, in such quantities that the thickness of each compacted layer is not more than 100 mm for Grading 1 and 75 mm for Grading 1 and 3, as specified in Clause 404.2.5. Wherever possible, approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly so as to minimise the need for manual rectification afterwards. Aggregates placed at locations which are inaccessible to the spreading equipment, may be spread in one or more layers by any approved means so as to achieve the specified results.

The spreading shall be done from stockpiles along the side of the roadway or directly from vehicles. No segregation of large or fine aggregates shall be allowed and the coarse aggregate as spread shall be of uniform gradation with no pockets of fine material.

The surface of the aggregates spread shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregates as may be required. The surface shall be checked frequently with a straight edge while spreading and rolling so as to ensure a finished surface as per approved drawings.

The coarse aggregates shall not normally be spread more than 3 days in advance of the subsequent construction operations.

**404.3.4. Rolling:** Immediately following the spreading of the coarse aggregate, rolling shall be started with tandem or vibratory rollers of 80 to 100 kN static weight. The type of roller to be used shall be approved by the Engineer based on trial run.

Except on superelevated portions where the rolling shall proceed from inner edge to the outer, rolling shall begin from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the centre line of the road, in successive passes uniformly lapping preceding tracks by at least one half width.

Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit application of screenings. However, where screenings are not to be applied, as in the case of crushed aggregates like brick metal, laterite and kankar, compaction shall be continued until the aggregates are thoroughly keyed. During rolling, slight sprinkling of water may be done, if necessary. Rolling shall not be done when the subgrade is soft or yielding or when it causes a wave-like motion in the subgrade or sub-base course.

The rolled surface shall be checked transversely and longitudinally, with templates and any irregularities corrected by loosening the surface, adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired crossfall (camber) and grade. In no case shall the use of screenings be permitted to make up depressions.

Material which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates.

It shall be ensured that shoulders are built up simultaneously along with water bound macadam courses as per Clause 407.4.1.

**404.3.5. Application of screenings:** After the coarse aggregate has been rolled to Clause 404.3.4, screenings to completely fill the interstices shall be applied gradually over the surface. These shall not be damp or wet at the time of application. Dry rolling shall be done while the screenings are being spread so that vibrations of the roller cause them to settle into the voids of the coarse aggregate. The screenings shall not be dumped in piles but be spread uniformly in successive thin layers either by the spreading motions of hand shovels or by mechanical spreaders, or directly from tipper with suitable grit spreading arrangement. Tipper operating for spreading the screenings shall be so driven as not to disturb the coarse aggregate.

The screenings shall be applied at a slow and uniform rate (in three or more applications) so as to ensure filling of all voids. This shall be accompanied by dry rolling and brooming with mechanical brooms, hand-brooms or both. In no case shall the screenings be applied so fast and thick as to form cakes or ridges on the surface in such a manner as would prevent filling of voids or prevent the direct bearing of the roller on the coarse aggregate. These operations shall continue until no more screenings can be forced into the voids of the coarse aggregate.

The spreading, rolling, and brooming of screenings shall be carried out in only such lengths of the road which could be completed within one day's operation.

**404.3.6. Sprinkling of water and grouting :** After the screenings have been applied, the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operation shall be continued, with additional screenings applied as necessary until the coarse aggregate has been thoroughly keyed, well-bonded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or subgrade does not get damaged due to the addition of excessive quantities of water during construction.

In case of lime treated soil sub-base, construction of water bound macadam on top of it can cause excessive water to flow down to the lime treated sub-base before it has picked up enough strength (is still "green") and thus cause damage to the sub-base layer. The laying of water bound macadam layer in such cases shall be done after the sub-base attains adequate strength, as directed by the Engineer.

**404.3.7. Application of binding material:** After the application of screenings in accordance with Clauses 404.3.5 and 404.3.6, the binding material where it is required to be



used (Clause 404.2.7) shall be applied successively in two or more thin layers at a slow and uniform rate. After each application, the surface shall be copiously sprinkled with water, the resulting slurry swept in with hand brooms, or mechanical brooms to fill the voids properly, and rolled during which water shall be applied to the wheels of the rollers if necessary to wash down the binding material sticking to them. These operations shall continue until the resulting slurry after filling of voids, form a wave ahead of the wheels of the moving roller.

**404.3.8. Setting and drying:** After the final compaction of water bound macadam course, the pavement shall be allowed to dry overnight. Next morning hungry spots shall be filled with screenings or binding material as directed, lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set. The Engineer shall have the discretion to stop hauling traffic from using the completed water bound macadam course, if in his opinion it would cause excessive damage to the surface.

The compacted water bound macadam course should be allowed to completely dry and set before the next pavement course is laid over it.

#### **404.4. Surface Finish and Quality Control of Work**

**404.4.1.** The surface finish of construction shall conform to the requirements of Clause 902. (Attached)

**404.4.2.** Control on the quality of materials and works shall be exercised by the Engineer in accordance with Section 900.

**404.4.3.** The water bound macadam work shall not be carried out when the atmospheric temperature is less than 0°C in the shade.

**404.4.4.** Reconstruction of defective macadam: The finished surface of water bound macadam shall conform to the tolerance of surface regularity as prescribed in Clause 902. However, where the surface irregularity of the course exceeds the tolerances or where the course is otherwise defective due to subgrade soil mixing with the aggregates, the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material as applicable and recompact. In no case shall depressions be filled up with screenings or binding material.

#### **404.5. Arrangement for Traffic**

During the period of construction, the arrangement of traffic shall be done as per Clause 112. (Attached)

#### **404.6. Measurements for payment**

Water bound macadam shall be measured as finished work in position in cubic metres.

#### **404.7. Rate**

The Contract unit rate for water bound macadam sub-base/base course shall be payable in full for carrying out the required operations including full compensation for all components listed in Clause 401.8 (i) to (v) including arrangement of water used in the work as approved by the Engineer.

**Unit rate for payment of this item shall be per 1-Cum. of complete item including all materials, tools and plants, all lead and lift and all labour and all the taxes and levies as may be admissible from time to time**

**Item No. 8 :: 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**

#### **1.0. Materials:**

**1.1.** Water, shall conform to M-1. Sand shall conform to M-6. Cement shall conform to M-3. Stone aggregate

40 mm. nominal size shall conform to M-12.

#### **2.0. Workmanship:**

##### **2.1. General:**

**2.1.1.** Before starting concrete bed of foundation trenches shall be cleared of all loose materials, levelled, watered and rammed as directed.

##### **2.2. Proportion of Mix :**

**2.2.1.** The Proportion of cement, sand and coarse aggregate shall be one part of cement, 3 parts of sand, 6 parts of stone aggregates and shall so measured by volume.

##### **2.3. Mixing :**

**2.3.1.** The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be

lowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in

mechanical mixer shall be done for a period 1 to 2 minutes. The quantity of water shall be sufficient to produce a dense concrete of required workability for the purpose.

#### **2.4. Transporting & Placing the concrete :**

2.4.1. The concrete shall be handled from the place of mixing to the final position in not more than 15 minutes by the methods directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

1.4.2. The concrete shall be laid in layers of 15 cms. to 20 cms.

#### **2.5. Compacting:**

2.5.1. The concrete shall be rammed with heavy iron rammers and rapidly to get the required compaction

and allow all the interestices to be filled with mortar.

#### **2.6. Curing :**

2.6.1. After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not

less than 7 days from the dale of placement.

#### **2.7. Mode of measurement and Payment:**

2.7.1. The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed.

**2.7.2. The rate shall be for a unit of one cubic metre.**

**Item No. 10 :- Providing and Laying ordinary cement concrete 1:1:2 (1- Cement 1- coarse sand : 2- graded stone aggregates 20 mm nominal size) and finishing smooth with curing etc. complete including the cost of formwork but excluding the cost of reinforcement for R.C.C work in (iii) Slabs having more than 10 cm and upto 13 cm. thickness**

**&**

**Item No. 11 :- Providing and laying ordinary cement concrete 1:1:2 (1- Cement 1- coarse sand : 2- graded stone aggregates 20 mm nominal size) and finishing smooth with curing etc. complete including the cost of formwork but excluding the cost of reinforcement for R.C.C work in (A) BEAMS :(iii) Having cross-sectional area more than 0.12Sq.M and upto 0.18 Sq.M**

## **Materials**

### **Cement**

- Cement shall be Ordinary Portland Cement (OPC) / PPC conforming to relevant IS specifications.
- Cement shall be fresh, free from lumps and stored properly.

### **Fine Aggregate**

- Fine aggregate shall be clean, coarse river sand or manufactured sand conforming to IS standards.
- Sand shall be free from silt, clay, organic matter and impurities.

### **Coarse Aggregate**

- Coarse aggregate shall be hard broken stone/gravel of graded size with maximum nominal size of 20 mm.
- Aggregate shall be clean, strong, durable and free from dust or deleterious materials.

### **Water**

- Water used for mixing and curing shall be clean and potable.

## **Proportioning and Mixing**

- Concrete shall be prepared in proportion **1:1:2** by volume.
- Gauge boxes shall be used for measurement of aggregates.
- Mixing shall preferably be done in mechanical mixer to obtain uniform consistency.
- Water-cement ratio shall be kept minimum necessary to achieve required workability and strength.

## **Centering and Shuttering**

- Formwork shall be made from steel plates or approved shuttering material sufficiently rigid and leakproof.
- It shall be properly supported, braced and aligned to maintain correct line, level and dimensions.
- Inner surfaces shall be cleaned and coated with shuttering oil before concreting.
- Formwork shall include centering, staging, supports and removal after stipulated period.

## **Placing and Compaction**

- Concrete shall be placed immediately after mixing and laid in layers without segregation.
- It shall be compacted thoroughly using mechanical vibrators to remove voids and honeycombing.
- Construction joints, if unavoidable, shall be made as directed.

## Finishing

- Top surface of slab shall be finished even, smooth and true to required slope and level.
- Edges and corners shall be properly finished.

## Curing

- Concrete surface shall be kept continuously moist for minimum 7 to 14 days after laying.
- Proper curing arrangements shall be made to prevent rapid drying and cracking.

## Exclusions

The item excludes:

- Reinforcement steel
- Binding wire
- Reinforcement cutting, bending and placing

These shall be measured and paid separately.

## Measurement

- Measurement shall be in **Cubic Metre (Cum)** of finished concrete work.
- Quantity shall be calculated based on actual dimensions executed at site.

## Rate Includes

The rate shall include:

- Cement, sand and aggregates
- Mixing, laying and compacting
- Vibrating and finishing
- Centering and shuttering
- Labour and tools & plants
- Water charges
- Curing
- Scaffolding
- Transportation, loading/unloading
- All leads, lifts, royalties and taxes
- Complete in all respects as directed by Engineer-in-Charge.

**Item No. 12 :- Providing TMT Bar FE 500/500D reinforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level for Ground Floor**

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. TMT 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 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:

$$CE = \frac{C}{6} + \frac{Mn}{5} + \frac{Cr + Mg + V}{15} + \frac{Ni + Cu}{100}$$

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 bent 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 bend shall not be less than 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 spilling of the concrete

10.6. 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 non-corrodible material wooden and metal supports shall not extend 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 blocks 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 from corrosion, concrete cover shall be provided as indicated on drawings. All bars protruding from concrete and to which other bars are to be laced 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 shear nor bending moments is maximum.

10.8. Whenever indicated on drawing or desired the Engineer in charge bars shall be jointed 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 standard threads Steel for coupling shall conform to IS 226

10.9. When permitted or specified on the drawings joints of reinforcement bars shall be butt-welded so as to transmit their full stresses Welded joints shall preferably be located at points where 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 stains paint and other foreign matter before welding Only competent welders shall be employed on the work. The MS 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

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

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.13 :: Providing & fixing M.S. Grill for with necessary fitting with necessary fitting with one coat of primer and two coat oil paint as per details given by architect. as per attached detail architectural drawing.**

1.0. materials

The structural steel shall conform to M- 22.

2.0. Workmanship

2.1. The M.S. Grill shall be prepared as per the drawings or as directed for fixing to wooden frames of windows etc.

2.2. The grill shall be fabricated to the designs and patterns shown in the drawings and the weight shall be as directed, and the joints shall be rivetted or welded as shown in the plan or as directed. The grill so formed shall be fixed into the frames of the windows etc., before they are erected in position. The outside strip frame of the grill shall be housed to its full thickness into the recess cut into the frame of the windows etc. The grill shall be fixed to the frame with number of bolts and nuts of screws viz. bolt nut/screw per 30 cm. of the length of outer strip subject to a minimum of 2 Nos. on each side of the frame or as indicated in the drawings or as directed.

2.3. The bolts and nut-, or screws shall be counter sunk and shall be fixed with the top of their heads flush with the face of 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 unit of one **Kg.**

**Item No. 14 :: Applying general insecticide pest control treatment to floors, cupboards etc including labour material etc. complete. Using Heptachloride 20 EC. As Per 6113\_pests Concentration Weight 0.50 percent is recommended one litre chemical emulsion dilute with 39 liter of water will give. Total dilute concentration will be 40 litre inclusive of one litre chemical emulsion application 0.5 Litre chemical / Sqm of surface is recommended as per I.S**

#### **1.0 MATERIALS :-**

The chemical and for the plinth soil treatment shall be one of the following with contraction shown against each in aqueous emulsion.

Chlordane – 0.25 liters per Sq.mt. flat area.

#### **2.0 WORKMANSHIP :-**

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

2.2 The top surface of the consolidated earth of plinth filling within the walls shall be treated with the chemical emulsion i.e. :CHLORDANE” at the rate of 0.25 liter per one Sq.mt. of the surface before the sand bed or sub grade is laid if the filled work has been well rammed and the surface does not allow the emulsion to seep through holes up to 50 to 75 mm. deep at 150 mm. centers both ways may be made with 12 mm. dia M.S. rod on the surface to facilitate absorption of the emulsion.

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

2.4 One format treatment soil barriers shall be not disputed if by chance treated soil barriers are disturbed immediate steps shall be taken to restore system.

2.5 The treatment against termite infection shall remain full effective for a period not less than 10 year from date of issue of the final certificate of completion of the work if at any time during this period any defects in treatment are related or any evidence of infection in any part of the building or structure is noted. The contractor shall rectify the concerned defect within 15 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 the 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 as directed by Engineer – in – charge shall

be final decision Guarantee shall remain force for the period of 10 years from the completion of work under the contract and it shall remains binding to the contractor for a period of 10 years.

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

## **2.8 FORM OF GUARANTEE BOND**

- 2.9 I/We

(Contractor) hereby guarantee that work will

remain unaffected and will not be in any way damaged by termite or any other germs of similar types, for a period of 10 years after completion of the work of anti-termite as per the terms and conditions of the contract and contractor hereby indemnifies and agrees to save harmless the Government of Gujarat from any loss 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 or damages suffered by the Government of Gujarat and further guarantee to redo the effective work without claiming any extra cost."

. This guarantee shall remain 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.

. 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.

- 2.10 Mode of Measurement and Payment.

- 2.11 The length and breadth shall be measured clean for the actually treated.

No deduction shall be made nor extra paid for any opening for pipes etc. up to 0.10 Sq.mt.

- 2.12 The rate shall be for a unit of the Sq.mt.**

**Item No. 22 :: 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 shade approved by architect as per Arch. drawing.**

#### 1.0. Materials

1.1. Water shall conform M-1. Cement Mortar shall conform to M-11. The

Vitrified tiles shall conform to relevant I.S. codes.

#### 2.0. Workmanship

2.1. The size of each Vitrified tiles shall be 24" x 24" and 8mm thickness. The sides thus dressed shall have a full contact if a straight edge is laid along. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness of the base where the tiles to laid shall not less than 20 mm. at any place of the slab.

2.2 Before laying of the Vitrified tiles the existing flooring if any shall be dismantled manually. During this period proper care should be taken to see that the adjoining structure or work or man power may not met with any type of accident. After dismantling the same, the ground shall be levelled to proper line, level and grade.

2.2. Bedding for the vitrified tiles shall be cement mortar 1: 6 (1 cement; 6 coarse sand) of average thickness 20 mm. as given in the description of the item. Sub grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall be then be spread on an area sufficient to receive one tiles. The tiles shall be washed clean before laying. It shall be laid on top pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. 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 bit. Over this surface, cement slurry of honey like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly pedded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining the wall shall enter not less than 1.0 mm. under the plaster, skirting or dado. The junction between the wall floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed.

2.3. The floor shall be kept wet, for a minimum period of 7 days. so that bedding and joints set properly.

#### 2.4 Fixing of tiles ::

The vitrified tiles of 600 x 600 and 8mm thick shall be fixed on the flooring with the flooring adhesive materials of approved quality and it shall be laid as recommended by the Manufacturer.

2.5. The holes required for Nahni traps, pipes any other fittings shall be made without any extra cost.

### 3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials and labour involved in all the operations described above. The Antiskid Vitrified tiles shall be measured in square metre correct to two places of decimal, length and breadth shall be measured correct to a centimetre and between the finished face of skirting dado or wall plaster and no deduction shall be made nor extra paid for any opening in floor of areas upto 0.1 [sq.mt.](#)

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

**Item No. 31 :- 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**

### Materials

- Aluminium sections shall be free from defects, warping, cracks and surface irregularities.
- Powder coating shall be electrostatic polyester powder coating with minimum thickness of **50 microns** or as approved by Engineer-in-Charge.
- Glass shall be **5 mm thick frosted/toughened obscured glass** of approved brand and quality.
- All screws, cleats, fasteners and accessories shall be aluminium/stainless steel and corrosion resistant.
- EPDM/rubber gasket, glazing vinyl and sealant shall be used for proper fixing and weatherproofing.

### Fabrication

- Aluminium sections shall be accurately cut, machined and assembled to required size and shape.
- Corners shall be joined mechanically using suitable cleats and screws.
- Frame members shall be rigid, square and properly aligned.
- Necessary grooves, rebates and slots shall be provided for fixing glass and hardware.

### Fixing

- The ventilation frame shall be fixed in masonry/RCC opening in true line, level and plumb using approved aluminium/SS fasteners, anchor bolts, holdfasts and fixing arrangement.
- Gaps between frame and wall shall be sealed with approved sealant/mortar as directed.
- 5 mm frosted glass shall be fixed with aluminium glazing beads and EPDM/rubber gasket complete.
- All exposed joints shall be properly sealed to make the assembly dustproof and weather resistant.

### Finish

- Powder coated surface shall be uniform in colour, smooth, scratch free and free from dents.
- Glass surface shall be clean and free from scratches, bubbles or visual defects.
- Finished ventilator shall operate smoothly and be properly secured.

### **The Rate Shall Include**

- Supply of aluminium sections
- Powder coating finish
- 5 mm frosted glass
- Aluminium beading
- Rubber gasket & sealant
- Hardware fittings and accessories
- Fabrication and erection
- Labour charges
- Scaffolding
- Transportation, loading/unloading
- All taxes, leads, lifts and incidental charges
- Complete in all respects as directed by Engineer-in-Charge.

### **Measurement**

Measurement shall be made in **Square Metre (Sqm)** of finished ventilation area.

### **Mode of Measurement**

Length and breadth of outer frame shall be measured for payment. No separate payment shall be made for fittings, wastage, cutting, beading, screws, sealants or accessories.



**Item No. 32 :- 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 offer beveled as specified. It shall be free from flaws specks, or bubbles and its thickness shall riot 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 load paint. The 6 mm thick plywood shall conform to M-37. The 6 mm. thick A.C. sheets shall conform to M-24.

2.0. Workmanship

- 2.1. 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 for satisfactory completion of this item.
- 3.2. The rate shall be for a unit of One number.

**Item No. 33 :: Providing and laying broken chine mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar creme out upto surface using white cement including rounding off junctions and extending them upto 15 cm along the wall,clearing with water and oxalic acid etc. as directed.**

#### 1.0 MATERIAL - WATER

1.1 Water shall not be salty brackish and shall be clean, reasonably clear and free objectionable quantities of silt and traces of oil injurious alkalis salts organic matter and other deleterious material which will either weaken the mortar of concrete or cause efflorescence or attack the steel in R.C.C. container for transport storage and huddling of water shall be clean. Water shall confirm to the Standard Specification in I.S. 455 - 1978.

1.2 If required by the Engineer in charge, it shall be tested by comparison with distilled water compression shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269 - 1976. Any indication of unsoundness charge in time of setting by 50 minutes or more or decrease of more than 10 percent strength of mortar prepared with distilled water sample when compared with the result 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/too alkaline.

1.4 It shall be free of elements which significantly affect the hydration reaction or otherwise interface with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.

1.5 Hard and bitter water shall not be used for curing.

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

#### 2.0 CEMENT

2.1 Cement shall be ordinary Portland slag cement as per I.S. 1624 - 1974 or Portland slag cement as per I.S.455-1976.

2.2 Cement shall be stored above the ground level in perfectly and dry and water tight sheds. Wherever bulk storage containers are used, there capacity should be sufficient to cater to the requirements at site and should be cleaned at least once every 3 to 4 months. The aggregate shall be stored in such a way as to prevent admixture of foreign materials. Different size of fine or coarse aggregate shall be stored in separate stock piles sufficiently away from the each other to prevent inter mixing the materials.

#### 3.0 SAND

- 3.1 Sand shall be natural sand, clean, well graded, hard, strong, durable and gritty particular free from immures amounts of dust, clay, kankar, modules, soft or flaky particles shall alkali salts, organic matter, learn mica or other deleterious substance and shall be got approved from the Engineer in charge. The sand shall not contain more than 8 percent of slit as determined by field test if necessary, the sand

COARSE SAND - The fineness modules of coarse sand shall not be less than 2.5 and shall not exceed 3.0. The sieve analysis of coarse sand be as under :

I.S. Sieve Designation	% by wt. passing
4.75 mm	100
2.36 mm	90 to 100
1.18 mm	70 to 100
600 MC	30 to 100
300 MC	85 to 70
150 MC	00 to 50

- 3.2 FINE SAND : The fineness modules shall not exceed 1.0 the sieve analysis of fine sand be as under:

I.S. Sieve Designation	% by wt. passing
4.75 mm	100
2.36 mm	100
1.18 mm	70 to 100
600 MC	40 to 85
300 MC	05 to 50
150 MC	00 to 10

- 3.3 Materials shall be stored as to prevent their deterioration of their quality and fitness for the work. Any material which has deterioration or has been damaged or is otherwise considered defective by the Engineer in charge shall not be used in the work.

#### WATER PROOFING COMPOUND

Water proofing compound shall be of approved quality and make as approved by Engineer in charge.

#### CHINA MOSAIC TILE PIECES

China mosaic tiles pieces shall be of 50 mm to 90 mm nominal size, tiles pieces shall be made from hard and good quality of tiles.

#### WHITE CEMENT

White cement shall be of approved make it shall confirm definition of I.S. 8042-E-1978 the sample of white cement shall be approved by Engineer in charge.

#### WORKMANSHIP

- A First of all surface of the entire terrace shall be cleaned by thoroughly brooming and then by wire brushes. All the loose material, dust and debris shall be removed thoroughly from the entire surface of the terrace.

All joints and cracks shall be raked off and cut in trench which shall be filled by neat cement slurry admixed with water proofing compound. The joints with parapet shall be raked up to 30 cm height and shall be applied by neat cement slurry admixed with water proofing compound.

Neat cement slurry shall be prepared and a water proofing compound of approved make shall be mixed with the slurry in proportion specified by the manufacturer of the compound and shall be laid through out the surface of the terrace by the use of brushes mala etc. Cement slurry shall be prepared by adding adequate quantity of water so as to spread it uniformly on the surface.

- B 50mm thick Cement concrete 1:2:4 (1 part of cement and 2 part of coarse sand 4 part of coarse aggregate nominal 20mm) by volume admixed with water proofing compound of approved make in specified proportion). Of specified thickness shall be laid (Specification of C.C. 1:2:4 shall be followed for the execution of this layer) all over the surface of the terrace in true level and required slope including rounding of junctions of walls and slabs.
- C After two days of proper curing applying a second coat of cement slurry on entire surface of the terrace.
- D The entire surface shall be finished with 20 mm thick C.M. 1:3 and China mosaic tiling in true level and slope as directed by Engineer in charge and finally finishing the surface with trowel with white cement slurry (Specification of white glazed tiles flooring shall be followed for the execution of this item).
- E Finishing the surface with 20 mm thick C.M. 1:3 and China mosaic tiling and finally finishing the surface with trowel with white cement slurry.
- F After two days proper curing the terrace shall be flooded for 15 days.

#### 7.0 MODE OF MEASUREMENT AND PAYMENT

- 7.1 The unit rate of flooring shall include the cost of all materials, tools and plant required for mixing, laying of base layer in true level and slope as required applying and placing broken pieces of china mosaic tile in position, compacting, finishing, curing, providing treatment of 30 cm high allover the length of parapets and corners and sill of doors etc. and all other incidental expenses for producing flooring work to complete the structure of its components as shown on the drawings and according to these specifications. They shall also include the cost of making, fixing of all scaffolding and forms required for the work.

The rate of plastering shall include the cost of all labour, materials, tools and plants, scaffolding and all incidental expenses as described herein above.

- 7.2 The water proofing treating work shall be measured for its length and width, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one Square Meter.

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

7.5 The payment will be made on **Square Meter** basis of the finished work.

#### 7.6 MODE OF MEASUREMENT AND PAYMENT

The length and breadth shall be measured correct to cm. as per the dimension of the sanctioned plants. No deduction shall be made not extra for paid for any opening for pipes etc. upto 0.1 sq.mt. The rate shall include the cost of all labour and materials required for the operation involved. For satisfactory completion of work & measurement shall be paid on unit of Sq.m. of finished work.

#### FORM OF GUARANTEE BOND

Contractor I / We \_\_\_\_\_) here by guarantee that work will remain unaffected and will not be in anyway damaged by water rain and will not leak from surface for a period for 5 years after completion of the work of water proofing treatment as per the terms and conditions of the contract and damage that might be caused on account of water rain and or other similar type of dampness of leakage from walls or above floor.

The guarantee shall remain in force for the period of 5 years from the completion of the work under the contract and it shall remain binding to the contractor for period of 5 years.

The deposit at the rate of 20% of the cost of this item from the running and final bills shall be recovered and remained for the first one year after completion of the work or at least on monsoon season passed which ever is later and 10% shall be retained for the balance of the guarantee period and shall be returned only after completion of the guarantee period.

**Item No.36 :: Providing and laying Mirror polished Machine polished Granite stone slab 18 mm (Average) thick for For Doors / Windows cill & Jams 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.**

#### General

This work shall consist of providing and fixing machine cut free edges machine polished Granite stone slab 18 mm thick (Single piece not more than 150 cm) for steps, threads and risers as per design of the shape and dimensions shown on the drawings and conforming to these specifications or as approved by the Engineer in charge.

#### 1.0 MATERIAL

Water shall confirm to M-1. Cement Mortar shall confirm to M-11. Granite slab shall confirm to M-52. Sand shall conform to M-6.

#### 1.0 GRANITE SLAB

1.1. Granite slab shall be hard even sound, and regular in shape and generally uniform in colour. The colour of the stone shall generally be green. Only approved coloured shall not be allowed for use. They shall be without any soft veins cracks or flaws Granite slab shall be hard, even, and regular in shape and it should be without fault.

1.2. The size of the Granite slab to be used for flooring shall be of size 600 mm x 600 mm size or as approved by Engineer in charge or Architect. However smaller sizes will be allowed to be used to the extent of maintaining required pattern. Thickness shall be as specified. For stair steps & risers the Granite slab shall be in single piece.

1.3. Tolerance of minus 30 mm. on accounts of chisel dressing of edges shall be permitted for length as well as breadth. Tolerance in thickness shall be +3 mm.

1.4. The edges of Granite slab shall be truly chiseled and table rubbed with coarse sand before paving. All angles and edges of the stones shall be true, square and free chipping and surface shall be true and plain.

1.5. The Granite slab shall have machine cut free edges with half round pipe moulding mirror polished surface. When brought on site. The stones to be used for flooring dado, skirting, sink, veneering, sills, steps, etc.

#### 2.0 WORKMANSHIP

2.1 Granite slab shall be of approved quality shall be laid evenly to level and slope as directed by Engineer in charge over a bed of a base layer consisting of cement mortar 1:6 (1 cement: 6 coarse sand by volume) or Lime Mortar 1:1.5 (1 lime : 1.5 lime putty by volume).

2.2 Granite slab shall be laid evenly as per detailed drawing or as directed by Engineer in charge. Width, length and shape of stone shall be as per pattern shown in detailed drawing.

2.3. Cement and sand for base layer shall be mixed in proportions of 1:6 (1 cement : 6 coarse sand by volume). Cement and sand shall be proportioned by volume after making due allowance for bulking. The require quantity of water shall then be added and the mortar mixed to produce workable consistency before mixing platform shall be thoroughly cleaned before changing from one type of cement to another.

2.4. The mixing for base layer shall be done intimately. The operation shall be carried out on clean water tight platform, and cement sand shall be first mixed dry in the required proportion to obtain uniform colour and then the mortar shall be mixed for at least two minutes after addition of water. In case of cement mortar, that has suffered because of evaporation of water the same shall be re-tempered by adding water as frequently as needed to restore the requisite consistency but its re-tempering shall be permitted only within thirty minute from the time of addition to water at the time of initial mixing.

2.5. Cement and sand for base layer shall be mixed in proportion as specified in the item, Cement and sand shall be proportioned by volume after making due allowance for bulking. The required quantity of water shall then be added and the mortar mixed to produce workable consistency.

2.6. Curing shall be started as soon as the mortar used for finished has hardened sufficiently no to be damaged when watered. It shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages;

2.7. During hot weather, all finished or partly finished work shall be covered or wetted in such manner as will prevent rapid drying of the flooring work.

2.8. Joints of Granite slab flooring shall be through and continuous throughout the building as directed by Engineer in charge.

2.9. Joints shall be filled with a stiff mixture of gray cement slurry.

2.10. The Granite slab flooring work shall be finished by rubbing and mirror polishing after the work of flooring is set properly.

### 3.0 MODE OF MEASUREMENT & PAYMENT :

3.1. The unit rate Granite stone slab flooring shall include the cost of all materials, tools and plant required for mixing, laying of base layer in true level and slope as required applying & placing stones in position, finishing, curing etc. flooring all over the length of walls and corners and sill of doors etc. and all other incidental expenses for producing flooring work to complete the structure or its components as shown on the drawings and according to these specifications. They shall also include the cost of making, fixing and removing of all scaffolding and forms required for the work. The rate includes cost of mirror polishing of flooring and dado work.

3.2 The rate shall include the cost of all materials and labours involved in all the operations described above. The granite stone slab flooring shall be measured in Square meter correct to 2 places of decimal. Length and breadth shall be measured to correct to a centimeter and between the finished the finished face of the skirting, dado or wall plaster and no deduction shall be made nor extra paid for any opening in floors or areas up to 0.1 square meter.

3.3 The rate shall be for a unit of one Square meter.

**Item No.40 :- Providing and fixing chromium plated brass half trun flush cock of approved quality including fixing in pipe line etc. complete.(ii) 25mm dia.**

1.0. Materials : Chromium plated brass 25mm dia. flush cock shall conform to M-67.

2.0. Workmanship

The flush cock of specified diameter shall be fixed as directed. The flush cock shall be fixed in G.I. pipe line with necessary fittings. The joints shall be made leak proof by using spun yarn and white Zink.

2.1 All pipes and fittings shall be fixed truly vertical and horizontal unless unavoidable. The pipes shall be fixed to walls with standard pattern clamps of required size and shape, one end of which shall be properly plugged or cemented into walls with cement mortar 1:3 (1 cement : 3 coarse sand) and the other tightened round the pipes to hold it securely. These clamps shall be spaced at regular intervals in straight lengths at 2 MC/C interval in horizontal run and 2.5 m. interval in vertical run. For pipe of 15 mm. dia. up to 25mm. dia. the holes in the walls and floors shall be made by drilling with chisel or jumper and not by dismantling the brick work or concrete. However for bigger diameter pipes the holes shall be carefully made cement : 3 coarse sand), and properly finished to match the adjacent surface.

2.2. Testing of joints :

2.2.1. After laying and jointing, the pipes and fillings shall be inspected under working conditions of pressure and flow. Any joints found liken shall be redone, and ail leaking pipes removed and replaced without extra cost.

2.3.2. The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 Kg./Sq cm. The pipe shall be slowly and carefully charged with water allowing all air to escape and avoiding all shocks and water hammer. The draw off takes and stop cock shall then be closed and specified hydraulic pressure shall be applied gradually. The pressure gauge must be accurate. The pipes and fittings shall be tested in sections as the work laying proceeds, keeping, the joints exposed for inspection during the testing.

3.0. Mode of measurements and payment

3.1. The rate includes cost of all materials and labour required for satisfactory completion of this item including fittings.

3.2. The rate shall be for a unit of One number.



**Item No. 41 :: Providing erecting and fixing double coated Syntex PVC. (ISI) water tank of required capacity each with all necessary fittings and connection etc. complete on terrace.**

General

This work shall consist of furnishing and placing providing and fixing I.S.I. mark PVC water tank with necessary fittings of the shape and dimensions shown on the drawings and conforming to these specifications or as approved by the Engineer in charge.

1.0 MATERIAL

1.1 PVC WATER TANK

PVC Water tank of specified capacity and of I.S.I. mark of approved in liters of approved make and quality equivalent to syntax product.

Net capacity shall be net volume of water stored between the lowest level of overflow and lowest specified level.

1.2 NIPPLE

Galvanize pipe nipple shall be of approved make and of best quality. Relevant specification given in Booklet of Building specification shall be applied for the execution of this item.

1.3 BALL VALVE

Ball valve shall be of approved make and of best quality. Relevant specification given in Booklet of Building specification shall be applied for the execution of this item.

1.4 CONNECTIONS

Connection shall be of approved make and of best quality. Relevant specification given in Booklet of Building specification shall be applied for the execution of this item.

2.1 Tank shall be approved quality and as per IS standard make. Material used in manufacturing tank shall be confirmed to relevant IS code. The material of tank and lead and fittings which may come in contact of water should be such that it does not impart any taste, colour or odour. It does not have any toxic effect and it does not contaminate the water. Thereby making it unpotable.

2.2 The tank shall be fixed properly in a level position and making all required necessary correction like inlet outlet flushing overflow and air vent. Tank shall be satisfying the standards of public health.

3.0 MODE OF MEASUREMENT AND PAYMENT

3.1 The unit rate of PVC Water tank shall include the cost of all materials, tools and plant required for lifting to required height with all lead and lift, placing and fixing in position, all required specials and jointing adhesive compound, finishing as per direction of the Engineer-in-charge, and all other incidental expenses for producing PVC water tank work of specified diameter to complete the structure or its components as shown on the drawings and according to these specifications, they shall also include the cost of making, fixing and removing of all scaffolding and forms required for the work.

The rate of PVC Water tank shall include the cost of all labour, materials, tools and plant scaffolding and all incidental expenses as described herein above.

3.2 The PVC water tank work shall be measured for its **volume** to specified capacity to those specified on plan or as directed. The rate shall be for a unit of **one litre basis**.

3.3 The payment will be made on [litre](#) basis of the finished work.

**Item No. 42 :- Providing and fixing 35 mm thick SINGLE SHUTTER FLUSH DOOR using Shutters with both size Decorative 1 mm thick Laminated, pattern and design is to be approved by the Architect, with Stainless Steel handle size 30 Cm Long, Tower Bolt size 15cm, & Heavy Stainless steel Aldrop as per detailed drawing / as directed.**

#### 1.0. Material

1.1. The work includes standard 35 mm thick SINGLE/DOUBLE SHUTTER FLUSH DOOR using Shutters with both size Decorative 1 mm thick Laminated, pattern and design is to be approved by the Architect, with Stainless Steel handle size 30 Cm Long, Tower Bolt size 15cm, & Heavy Stainless steel Aldrop as per directed by Engineer in charge.

1.0. [35mm thick door shutter for doors both side 1mm laminated](#) of approved make or as directed engineer in charge.

Heavy Godrej Lock, S.S. handles, stoppers & fixtures and fastenings including complete as shown on plans.

#### 2.0. Workmanship

The Item covers the requirements of preparation of door as per detailed drawing and fixing as mention in Drawing.

#### 3.0. Fixtures and fastenings

S.S. Fixtures and fastenings shall be approved make and fixing with S.S screws. The size and number of Hinges shall be as per table given in Annexure-1 of building booklet which is attached herewith.

#### 4.0 Mode of Measurement

The unit rate of specified item shall include cost of all materials, labours & fixing door at site as shown in drawing.

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

**Item No. 43 :: Providing and supplying ISI Standard R.C.C. pipes(of Sulphate Resisting Cement) in standard lengths of following class and diameter suitable for either collar joints or rubber ring joints including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc. Class NP3 Test Pressure 0.7 Kg/sq.cm 200mm Dia.**

## Materials

### Cement

- Sulphate Resisting Cement (SRC) conforming to relevant IS specifications shall be used.
- Cement shall be fresh, dry and free from lumps.

### Fine Aggregate

- Clean coarse sand free from silt, clay, salts and organic impurities.

### Coarse Aggregate

- Hard broken stone aggregate of approved quality and grading.

### Reinforcement

- Mild steel or high yield strength deformed bars/wires conforming to relevant IS standards.
- Reinforcement cages shall be accurately fabricated and securely tied.

### Water

- Clean potable water suitable for concrete manufacture and curing.

## Manufacture

- Pipes shall be manufactured by approved process such as:
  - Vertical casting
  - Spinning process
  - Vibration process
  - Roller suspension process
- Concrete shall be dense, compact and free from honeycombing or cracks.
- Pipes shall be machine made and properly cured to achieve specified strength and durability.
- Each pipe shall bear permanent marking indicating:
  - Manufacturer's name/mark
  - Class NP3
  - Diameter
  - Date of manufacture
  - ISI mark

## Dimensions and Class

- Internal Diameter: **200 mm**
- Pipe Class: **NP3**
- Standard Length: As per IS specification
- Test Pressure: **0.7 kg/sq.cm**
- Ends shall be suitable for:
  - Collar joint, or
  - Rubber ring joint

## Testing

Pipes shall be tested as per IS 458 requirements for:

- Hydrostatic pressure test
- Three-edge bearing test
- Water absorption test
- Straightness and dimensional tolerance

Only pipes passing all required tests shall be accepted.

## Jointing Arrangement

### Collar Joint

- Ends shall be accurately formed for proper alignment with RCC collars.

### Rubber Ring Joint

- Groove-ended pipes suitable for elastomeric rubber ring joints ensuring watertight connection.

## Supply and Delivery

The item shall include:

- Loading at factory
- Transportation to departmental store/site
- Freight charges
- Insurance charges
- Octroi/GST and all taxes
- Inspection charges
- Unloading and stacking at designated location
- Handling and protection from damage during transit

Pipes shall be stacked on level ground with proper supports to prevent cracking or deformation.

## Inspection and Acceptance

- Pipes shall be inspected visually for cracks, damage, honeycombing and dimensional accuracy.
- Defective or damaged pipes shall be rejected and replaced by contractor at no extra cost.

## Measurement

Measurement shall be made in:

- **Running Metre (Rmt)**, or
- **Number of Pipes**

as specified in schedule of quantities.

## Rate Includes

The rate shall include:

- Supply of NP3 class RCC pipes
- Sulphate resisting cement
- Reinforcement
- Manufacturing and curing
- ISI testing and certification
- Transportation and freight
- Insurance and taxes
- Loading, unloading and stacking
- All labour, tools, plants and incidental charges
- Complete in all respects as directed by Engineer-in-Charge.

**Item No. 44 : Providing and fixing Mosquito net shutter and fixed to all size window with frame shutter frame vertical Moving. with necessary closer, fixtures and fastening rubber biding clips etc. complete.**

## **Materials**

### **Aluminium Frame**

- The outer frame and shutter frame shall be made from approved quality extruded aluminium sections of suitable size and thickness.
- Aluminium sections shall be straight, true, free from defects, cracks and warping.
- Sections shall be powder coated/anodized in approved colour and finish.

### **Mosquito Mesh**

- Mesh shall be made from:
  - Fibre glass mesh / SS mesh / nylon mesh as approved.
- Mesh shall be fine woven, durable, corrosion resistant and free from tears or defects.
- Mesh colour shall be approved by Engineer-in-Charge.

### **Rubber Beading**

- PVC/EPDM rubber beading shall be provided for proper fixing and tightening of mesh.
- Rubber beading shall hold mesh firmly without looseness or wrinkles.

### **Hardware and Accessories**

The item shall include:

- Rollers/sliding arrangement
- Vertical guide channels
- Handle
- Closer arrangement
- Locks/latches if required
- Screws, clips and fasteners
- Corner cleats
- Rubber buffers/stoppers
- Necessary fixtures and fittings

All hardware shall be rustproof and of approved make.

## Fabrication

- Aluminium sections shall be cut accurately and assembled mechanically using suitable cleats and fasteners.
- Mesh shall be tightly fixed in shutter frame using rubber spline/binding.
- Frames shall be square, rigid and free from distortion.

## Fixing

- The mosquito net shutter shall be fixed to window frame in true line, level and plumb.
- Vertical sliding/moving arrangement shall operate smoothly without jamming.
- Necessary guide channels and rollers shall be fixed firmly.
- All screws and fasteners shall be properly concealed as far as possible.
- Gaps between frame and window shall be properly sealed.

## Finish

- Powder coated/anodized finish shall be uniform and scratch free.
- Mesh shall be neatly stretched without sagging.
- Completed shutter shall slide smoothly and fit properly.

## Rate Includes

The rate shall include:

- Aluminium frame and shutter
- Mosquito mesh
- Powder coating/anodizing
- Rubber binding/beading
- Vertical sliding arrangement
- Closers, clips and fittings
- Handles, rollers and guide channels
- All fixtures and fasteners
- Fabrication and installation
- Labour charges
- Transportation, loading/unloading
- Scaffolding, tools and plants
- All taxes, leads and lifts
- Complete in all respects.

## Measurement

Measurement shall be made in **Square Metre (Sqm)** of finished mosquito net shutter area.

## Mode of Measurement

Area shall be measured based on outer dimensions of finished frame. No separate payment shall be made for fittings, mesh overlap, rollers, clips, rubber beading, wastage or accessories.

**Item No. 45 : Providing and fixing pre-cast Rubber Dye / steel Dye inter locking concrete block 60mm thick with grade of concrete M300 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. Materials**

### **a. Pre-Cast Concrete Cobbles**

- **Type:** Artificial, rubber-molded, pre-cast concrete cobbles.
- **Size & Thickness:** 60 mm thick; shape, size, and pattern as per approved design.
- **Surface Finish:** Textured, punch design (anti-skid).
- **Color:** Natural concrete grey or pigmented as per requirement.
- **Grade of Concrete:** **M-250** (characteristic compressive strength = 25 MPa).
- **Manufacturing Process:**
  - Cast using **rubber molds**.
  - **Pneumatically compressed** and/or **mechanically vibrated** for densification.
  - Cured for a minimum of 14 days before use.

### **b. Bedding Sand**

- **Thickness:** Minimum 35 mm compacted.
- **Material:** Clean, coarse river sand (well-graded).
- **Moisture:** Slightly moist at time of laying for better compaction.
- **Free from:** Organic impurities, clay, silt, or debris.

### **c. Jointing Sand**

- Same clean sand used for filling joints between cobbles after laying.
- Spread dry and broomed into joints.
- May be compacted lightly using plate compactor to ensure tight locking.

## **2. Sub-Base Preparation**

- **Existing surface** to be cleaned, compacted, and brought to correct line and level.
- A sub-base layer (e.g., GSB or DLC) should already be constructed as per project drawings.
- Surface should be firm, level, and capable of supporting paver load.

## **3. Laying Procedure**

### **a. Bedding Sand Layer**

- Spread a uniform 35 mm layer of coarse sand over the prepared sub-base.

- Level it using screed boards to ensure even thickness.

#### **b. Laying of Pre-Cast Concrete Cobbles**

- Lay cobble stones manually by hand over the sand bedding.
- Keep joints tight and pattern aligned as per approved layout.
- Ensure line and level are maintained using strings and spirit level.

#### **c. Compaction**

- After laying, lightly compact the cobble surface using a **vibrating plate compactor** with rubber mat.
- Ensure stones are properly seated and aligned.

#### **d. Joint Filling**

- Spread dry sand over the surface and broom into joints.
- Repeat process to ensure all joints are filled.
- Avoid use of cement or mortar in joints unless specified.

### **4. Finishing and Cleaning**

- After compaction and joint filling, sweep off excess sand.
- Clean the surface of debris, cement stains, or dirt.
- Ensure surface is uniform, aligned, and free from rocking stones.

### **5. Quality Control**

Test Item		Requirement/Standard	Frequency
Compressive Strength of Cobbles		Minimum 25 MPa (as per M-250)	One sample per 500 m <sup>2</sup>
Surface Dimensions		Tolerance $\pm 2$ mm	Random sampling
Sand Grading		As per IS: 383	One per lot
Level Tolerance (surface)		Max deviation: 5 mm in 3 m straight edge	Every 25 m <sup>2</sup> or as directed

### **6. Measurement and Payment**

- Measurement shall be in **square meters (m<sup>2</sup>)** of actual area paved.



**Item No. 46 :: "Providing and fixing CUPBOARD shutters using 19 mm thick waterproof ( ISI 710) and fixing 0.8 mm thick decorative lamination sheet 20 mm x 2 mm Plywood frame having a size 7 cm x 4 cm using necessary fixtures, fastening, nails, fevicol, ball catch, magnet and innerside of cupboard oil painting two coats with primer coat etc. complete as per Engineer in Charge.**

#### 1.0. Materials

- (A) CUPBOARD with 19 mm thick ISI waterroof plywood
- (B) 19 mm thick ISI plywood shutter
- (C) Both side pre laminated shall conform to relevant I.S. specification.
- (D) Stainless Steel butt hinges shall conform
- (E) Stainless Steel Handle and stopper shall conform to relevant I.S. specification.

#### 2. 0. Workmanship:

The item covers the requirement of preparation of Cupboard, their supply and fixing with 19mm thick Water proof plywood for 19mm thick Door covered with 0.8 mm thick both side laminated sheet..

#### 2.1. Shutters :

2.1.1. The single door shutter with 19mm thick Water proof plywood as per detailed drawings supplied by the Department. The shutter for doors shall be Constructed in the form of timber frame work of styles and rails with panel inserted of type specified in the detailed drawings. Panel shall be fixed by providing grooves in the style and rails. The styles and rails shall be joined to each other by mortise and tenon joints at right angles.

2.2. The shutters shall be prepared by fittings styles and rails (top, bottom, lock and frieze) as for paneled leaves with simple chamfer on edges only. The styles and rails shall be grooved with just sufficient width for received panels and plain panels of specified type panels shall be fitted into the grooves.

2.2.1 The door shall be decorated with 1mm thick pre laminated both side particle board of standard make.

2.2.2. The size of styles and rails shall be as per drawing or as directed. Styles and rails of shutters shall be made of one piece only.

2.3. Both side Laminated board:

2.3.1. 0.8mm Thick both side laminated board shall be as specified in the item is shown in the drawing or as directed.

2.3.2. The faces of the panel as well as various pieces of the panel shall be closely fitted to the sizes of the grooves.

2.3.3. Finishing of the corners of raised panel edges shall be done as shown in drawings or as directed.

2.5. Fixtures & Fastenings :

2.5.1. The door shall be fixed with heavy Lock concealed brass dead lock with Key Hole with Two pairs of 32mm dia and 300mm long S.S.. Handle three No. shall be fixed and 35mm dia Decorative stud shall also be fixed as directed.

2.5.2 The rate shall include fixture and fastening as per para 2.5.1 including fixing with iron screws. The size and number of hinges shall be as per table given in annexure-1.

CODE PRACTIC-13(B) SCHEDULE OF  
FIXTURE AND FASTENINGS FOR DOORS,  
WINDOWS VENTILATORS, WARDROBES  
AND CUPBOARDS.

NOTATIONS

Da - -----	Teak wood doors fully panelled or fully glazed or partly panelied anti glazed
Db -----	Bathroom and W.C. door with single shutter
Dd -----	Doors battenned ledged and braced

De -----	Doors battened framed and braced
Wa, -----	Teakwood windows fully pannelled or fully glazed or partly pannelled and glazed
Va:Ind --- - ----	Teakwood ventilators
(independent) S.W - -----	Steel
Windows SV-Ind ----- ventilators	Steel
(independent) CB ----- Cupboard	
S.1 -----	
Single shutter S.2 -----	
Double shutter SA --- - - - - our shutter	1-
B -----	Breadth of door shutter
T -----	Thickness of door shutter
H -----	Height of window shutter
900 -----	900 mm and below
900 - - -----	above 900 mm.
1200 -----	1200 mm. & below
1200	above 1200 mm.

3.00 Application of Two coat of DUCO FINISH paint :-

### 3.1.0 Materials

3.1.1. The Duco Finish paint shall conform to relevant I.S.Specifications.

### 3.2.0 Workmanship

3.2.1. General: The materials required for work of painting work shall be obtained directly from approved manufacturers or approved dealer and brought to the site in maker's drums, kegs, etc. with seal unbroken.

3.2.2. All materials not in actual use shall be kept properly protected, lids of containers shall be kept closed and surface (if paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become state or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring

into small containers. While applying also, the paint shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use the containers shall be kept properly closed.

3.2.3. If for any reasons, thinning is necessary, the brand of thinner recommended by the manufacture shall be used.

3.2.4. The surface to be painted shall be thoroughly cleaned and dusted. All rust, dirt and grease shall be thoroughly removed before painting is started. No painting on exterior or other exposed parts of the work shall be carried out in\_wet, damp or-otherwise unfavorable weather and all the surfaces shall be thoroughly dry before painting work is started.

### 3.3 Application of Duco Finish paint:-

3.3.1. Brushing operations are to be adjusted to the spreading capacity advised by the manufacture of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing any laying off will constitute one coat.

3.3.2. Each coat shall be allowed to dry completely and lightly rubbed with very fine grade of and-paper and loose particles brushed off before next coat is applied. Each coat shall vary slightly in shade and shall be got approved from Engineer-in- charge before next coat is started.

3.3.3. Each coat except the last coat shall be lightly rubbed down with sand -paper of fine pumice stone and cleaned of dust before the next coat is applied. No hair marks, from the brush or clogging of paint puddles in the corners of panels, angles of Moulding etc. shall be left on the work.

3.3.4. Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved best quality brushes shall be used.

### 4.0. Mode of measurements & payment

4.1. The rate for shutter includes cost of providing block and clear for keeping the shutter in open position as directed.

4.2. The dimensions of the shutter shall be measured clear size of the shutter in close position between the grooves of the frame.

4.3. The rate shall be for a unit of one sq. metre.

**Item No 47 :- Providing and laying coloured glazed tiles of the size 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.**

#### **1.0. Materials:-**

Water shall conform to M-1. Cement mortar shall conform to M-11. Coloured 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 atleast 15 mm. While the masonry is being laid. In case of concrete wall, the surface shall be chiseled and roughened 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 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 and edges with white cement slurry set in bedding mortar. The tiles shall be gently tapped in position one after the other keeping the joints as thin as possible. Top of skirting or dado shall be truly horizontal and the joints vertical or as per required pattern.

**2.2.2.** Risers of steps, skirting and dado shall rest on top of treads of 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 surfaces shall be washed clean.

**3.0. Mode of measurements & 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 dado shall be measured in square metres. Length and height shall be measured along the finished face of the skirting or dado 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.

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

**Deputy Executive Engineer  
R & B Sub Division`  
Morbi**

**Executive Engineer  
R & B Sub Division  
Morbi**