

RAJKOT NAGARIK SAHAKARI BANK LTD.

CIVIL, FURNITURE AND ELECTRIC WORK (ONLY
LABOUR) FOR RAJKOT NAGARIK SAHAKARI BANK LTD
BHUJ BRANCH AT BHUJ, DIST.-KACHCHH

: NAME OF WORK:

**CIVIL, FURNITURE AND ELECTRIC WORK (ONLY LABOUR) FOR
RAJKOT NAGARIK SAHAKARI BANK LTD BHUJ BRANCH AT BHUJ, DIST.-
KACHCHH**

SECTION II

GENERAL SPECIFICATION

GENERAL SPECIFICATION OF MATERIALS

M-1 Water:

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

M-3 Cement:

- 3.1 Cement shall be ordinary Portland slag cement as per IS. 269-1976 or Portland slag cement as per IS. 455-1976 or as specified.

M-4 White Cement:

- 4.1 The white cement shall conform to IS. 80412-E 1978.

M-5 Colored Cement:

- 5.1 Colored cement shall be with white or gray Portland cement as specified in the item of the work.
- 5.2 The pigments used for colored cement shall be of approved quality and shall not exceed 10 % of cement use in the Mix. The mixture of pigment shall be

properly grounded to have a uniform color and shade. The pigments shall have such properties to provide for durability under exposure to sunlight and weather.

- 5.3. The pigment shall have the property such that it is neither affected by the cement nor detrimental to it.

M-6 Sand:

- 6.1. Sand shall be natural sand, clean, well graded, hard strong durable and gritty particle free from injurious amounts of dust clay, kankar nodules, soft or flaky particles shale, alkali; salts organic, matter, loam, 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 silt as determined by field test, if necessary the sand shall be washed to make it clean.

6.2. Coarse Sand:

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

I. S. Sieve Designation	Percentage by weight passing sieve	I. S. Sieve Designation	Percentage by weight passing sieve
4.75 mm.	100	600 Micron	30 – 10
2.36 mm.	90 To 100	300 Micron	5 – 70
1.18 mm.	70 – 100	150 Micron	0 – 50

6.3 Fine Sand:

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

I. S. Sieve Designation	Percentage by weight passing sieve	I. S. Sieve Designation	Percentage by weight passing sieve
4.75 mm	100	600 Micron	40 – 85
2.36 mm	100	300 Micron	5 – 50

1.18 mm	70 – 100	150 Micron	0 – 10
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M-7 Stone Dust:

- 7.1 This shall be obtained from crushing hard black trap or equivalent. It shall not contain more than 8% of silt as determined by field test with measuring cylinder. The method of determining silt contents by field test is given as under
- 7.2 A sample of stone dust to be tested shall be placed without drying in 200 mm. measuring cylinder. The quantity of the sample shall be such that it fills the cylinder up to 100 mm. mark. The clean water shall be added up to 150 mm. mark. The mixture shall be stirred vigorously and the content allowed settling for 3 hours.
- 7.3. The height of silt visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the silt content within the allowable limit.
- 7.4. The fineness modulus of stone dust shall not be less than 1.80.

M-8 Stone Grit:

- 8.1. Grit shall consist of crushed or broken stone and be hard strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent adhesion of mortar Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1970. Unless special stone of particular quarries is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.
- 8.2. The grit shall conform to the following gradation as per sieve analysis:

I.S. Sieve Designation	Percentage by weight passing through sieve
12.50 mm	100 %
10.00 mm	85 – 100 %
4.75 mm	0 – 20 %
2.36 mm	0 – 25 %

- 8.3. The crushing strength of grit will be such as to allow the concrete in which it is used to built-up the specified strength of concrete.
- 8.4. The necessary tests for grit shall carried out as per the requirements of I.S. 2386 (Parts I to VII) 1963, as per instructions of the Engineer-in-charge. The necessity of test will be decided by the Engineer-in-charge.

M-11 Cement Mortar:

- 11.1. Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-6. 11.2. Proportion of Mix:
- 11.2.1 Cement and sand shall be mixed to specified proportion; sand being measured by measuring boxes. The proportion of cement will be by volume on the basis of 50 Kg. / Bag of cement being equal to 0.0342 cum. The mortar may be hand mixed or machine mixed as directed.

11.3. Preparation of mortar:

- 11.3.1 In hand mixed mortar cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over at least 3 times or more till a homogenous mixture of uniform color is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform color so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.
- 11.3.2 The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 Stone Coarse Aggregate for Nominal Mix Concrete:

- 12.1. Coarse aggregate shall be machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- 12.2. The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the course

aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However in case of reinforced cement concrete the maximum limit may be restricted to 6 mm less than the minimum lateral clear distance between bars or 6 mm less than the cover, whichever is smaller.

TABLE

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

Note: This percentage may be varied somewhat by Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

12.3. The grading test shall be taken in the beginning and at the change of source of materials. The necessary test indicated in I.S. 383-1970 and I.S. 456-1978 shall have to be carried out to ensure the acceptability. The aggregates shall be stored separately and handled in such a manner as to prevent the intermixing of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make them clean.

M-13 Black Trap or Equivalent Hard Stone Coarse Aggregate:

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

- 13.2. The aggregates shall generally be cubical in shape. Unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.
- 13.3. The necessary tests indicated in I.S. 383-1970 and I.S. 456-1978 shall have to be carried out to ensure the acceptability of the material.
- 13.4. If aggregate is covered with dust, it shall be washed with water to make it clean.

M-16 Stone:

- 16.1. The stone shall be of the specified variety such as Granite/Trap Stone / Quartzite or any other type of good hard stones.

The stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be used. The percentage of water absorption shall not be more than 5% of dry weight, when tested in accordance with I.S. 1134- 1974. The minimum crushing strength of the stone shall be 200 Kg. / Sq.Cm unless otherwise specified.

- 16.2 The samples of the stone to be used shall be got approved before the work is started.
- 16.3 The Khanki facing stone shall be dressed by chisel as specified in the item for Khanki facing in required shape and size. The face of stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm. nor shall it have depressions more than 10 mm. from the average wall surface.

M-26 Shuttering:

- 26.1. The shuttering shall be either of wooden planking of 30 mm minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical bellies properly cross braced together so as to make the centering rigid. In places of bulged props, brick pillar of adequate section built in mud mortar may be used.

- 26.2. The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.
- 26.3. If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete formwork shall be got inspected by and got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.
- 26.4. The props shall consist of bullies having 100 mm minimum diameters measured at mix length and 80 mm at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm. thick and minimum bearing area if 0-10 Sqm lay on sufficiently hard base.
- 26.5. Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.
- 26.6 The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planed on the sides and surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.
- 26.7 As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.
- 26.8 The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before, the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacturer may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.
- 26.9 The shuttering for beams and slabs shall have camber of 4 mm. per meter (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be $1/50$ of the projected length or as directed by the Engineer-in-charge.

M-44 Paints:

44.1 (A) Oil paints:

- 44.1.1 Oil paints shall be of the specified color and shade, and approved. The ready mixed paint shall only be used. However, if ready mixed paint or specified shade or tint is not available, white ready mixed paint with approved Steiner will be allowed. In such a case, the contractor shall ensure that the shade of the paint so allowed shall be uniform.
- 44.1.2 All the paints shall meet with following general requirements:
- (i) Paint shall not show excessive setting in a freshly opened full can and shall easily be redispersed with a paddle to a smooth homogeneous state. The paint shall show no curdling, leveraging, caking or color separation and shall be free from lumps and skins.
 - (ii) The paint as received shall brush easily, possess good leveling properties and show no running or sagging tendencies.
 - (iii) The paint shall not skin within 48 hours in three quarters filled closed container.
 - (iv) The paint shall dry to a smooth uniform finish free from roughness, grit, unevenness and other imperfections.
- 44.1.3 Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

44.2 (B) Enamel Paints:

- 44.2.1 The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paint shall conform to I.S. 2933 - 1975.

M-47 Flooring Tiles:

47.4. (D) Chequered Tiles:

- 47.4.1 Chequered tiles shall be plain cement tiles or marble mosaic tiles. The former shall have the same specification as per (A) above and the latter as per marble mosaic tiles as per (C) except as mentioned below.
- 47.4.2 The tiles shall be of nominal size of 250 mm x 250 mm or as specified. The center-to-center distance of chequered shall not be less than 25

mm and not more than 50mm. The overall thickness of the tile shall be 22 mm.

47.4.3 The grooves in the chequers shall be uniform and straight. The depth of the grooves shall not be less than 3 mm. The chequered shall be plain, coloured or mosaic as specified. The thickness of the upper layer measured from the top of the chequered shall not be less than 6 mm. The tiles shall be given the first grinding with machine before delivery to site.

47.4.4 Tiles shall conform to relevant I.S. 1237 – 1980.