

Where surfaces are to be welded, the steel shall not be painted or metal coated within a suitable distance from any edges to be welded, if the specified paint or metal coating would be harmful to welders or is likely to impair the quality of site welds.

Exposed machined surfaces shall be adequately protected.

1906.5 Painting at Site

Surfaces which will be inaccessible after site assembly shall receive the full specified protective treatment before assembly.

Surfaces which will be in contact after site assembly shall receive a coat of paint (in addition to any shop priming) and shall be brought together while the paint is still wet.

Damaged or deteriorated paint surfaces shall be first made good with the same type of coat as the shop coat.

Where steel has received a metal coating in the shop, this coating shall be completed on site so as to be continuous over any welds, bolts and site rivets.

Specified protective treatment shall be completed after erection.

1906.6 Methods of Application

The methods of application of all paint coatings shall be in accordance with the manufacturer's written recommendation and shall be as approved by the Engineer. Spray painting may be permitted provided it will not cause inconvenience to the public and is appropriate to the type of structure being coated. Areas inaccessible for painting and areas shaded for spray application, shall be coated first by brushing.

Oil based red lead primers must be applied by brush only, taking care to work into all corners and crevices.

The primer, intermediate and finishing coats shall all be applied so as to provide smooth coatings of uniform thickness. Wrinkled or blistered coatings or coatings with pinholes, sags, lumps or other blemishes shall not be accepted. Where the Engineer so directs, the coating shall be removed by abrasive blast cleaning and replaced by the Contractor at his own cost.

1906.7 Protective Coatings in Different Environments

Since the severity of corrosion depends upon atmospheric conditions and these vary enormously, there is no single protective system or method of application that is suitable for every situation.

Table 1900-3 gives guidelines for various types of coatings to be used in various environmental conditions. Approximate life to first maintenance is also indicated.

1907 TESTS AND STANDARDS OF ACCEPTANCE

The materials shall be tested in accordance with relevant IS Specifications and necessary

test certificates shall be furnished. Additional tests, if required, shall be got carried out by the Contractor at his own cost.

The fabrication, furnishing, erection and painting of structural steel work shall be in accordance with these Specifications and shall be checked and accepted by the Engineer.

Table 1900-3 : Guidelines for Selection of Types of Protective Coatings

| | Type of Coating | Exposure Condition |
|-------|---|--|
| i) | Wire brush to remove all loose rust and scale; 2 coats drying oil type primer, and 1 under coat alkyd type paint; 1 finishing coat alkyd type. Total dry thickness = 150 μ m | Moderate |
| ii) | Wire brush to remove all loose rust and scale; 2 coats drying oil type primer; 2 under coats micaceous iron oxide (MXO) pigmented phenolic modified drying oil. Total dry film thickness = 170 μ m (life up to 5 years) | Polluted inland environment |
| iii) | Blast clean the surface; 2 coats of quick drying primer; undercoat alkyd type paint; 1 finishing coat alkyd type. Total dry film thickness : 130 – 150 μ m | Moderate |
| iv) | Blast clean the surface; 2 coats of drying type oil primer; 1 under coat micaceous iron oxide pigmented drying oil type paint. Total dry film thickness : 165–190 μ m | Polluted inland environments |
| v) | Blast clean the surface; 2 coats of metallic lead pigmented chlorinated rubber primer, 1 undercoat of high build chlorinated rubber primer, 1 under coat of high build chlorinated rubber; 1 finishing coat of chlorinated rubber. Total dry film thickness : 200 μ m | Severe coastal and non-coastal interior situations |
| vi) | Blast clean the surface; 350 – 450 μ m thickness coal tar epoxy. | Severe |
| vii) | Pickle; hot dip galvanised (Zinc). Total thickness : 85 μ m (life up to 15-20 years) | Moderate |
| viii) | Grit blast, hot dip galvanised. (Zinc). Total thickness = 140 μ m (life more than 20 years) | Moderate |
| ix) | Grit blast; 1 coat of sprayed zinc/aluminum followed by suitable sealer Total thickness = 150 μ m (life up to 15-20 years) | Severe |

1908 MEASUREMENTS FOR PAYMENT

The measurements of this item shall be in tonnes based on the net weight of metal in the fabricated structure, computed on the basis of nominal weight of materials.

The weight of rolled and cast steel and cast iron shall be determined from the dimensions shown on the drawings on the following basis :

- Rolled or cast steel : 7.84×10^{-3} kg/cu.cm.
- Cast Iron : 7.21×10^{-3} kg/cu.cm.

Weight of structural sections shall be nominal weight.

Weight of castings shall be computed from the dimensions shown on the drawings with an addition of 5 percent for fillets and over-runs.

Weight of rivet heads shall be computed by taking the weight of 100 snap heads as given in Table 1900-4.

When specially agreed upon, allowance for snap heads may be taken as a flat 2.5 percent of the total weight.

Table 1900-4 : Weight of Rivet Heads

| Dia of Rivet as Manufactured-mm | Weight of 100 Snap Heads - kg |
|--|--------------------------------------|
| 12 | 1.3 |
| 14 | 2.1 |
| 16 | 3.4 |
| 18 | 4.45 |
| 20 | 6.1 |
| 22 | 8.1 |
| 24 | 10.5 |
| 27 | 15.0 |
| 30 | 20.5 |
| 33 | 27.2 |

The Contractor shall supply detailed calculation sheets for the weight of the metal in the fabricated structure.

No additions shall be made for the weight of protective coatings, weld fillets, bolts, nuts and washers.

Where computed weight forms the basis for payment, the weight shall be calculated for exact cut sizes of members used in the structure, deductions being made for all cuts, except for rivet holes. Additions shall be made for the rivet heads as mentioned above.

When specially agreed upon, the basis for payment may be the bridge weight complete, according to specifications included in special provisions of the contract.

1909 RATE

The contract unit rate for the completed structural steel work shall include the cost of all materials, labour, tools, plant and equipment required for fabrication, connections, oiling, painting, temporary erection, inspection, tests and complete final erection as shown on the drawings or as directed by the Engineer and as specified in these Specifications.

from the bank, thus lowering and sliding out the tilted platform under the crate, gradually placing the crate on the slopes while the tilted platform rotates around its hinges.

2504 PITCHING/REVETMENT ON SLOPES

2504.1 Description

The work shall consist of covering the river side slopes of guide bunds, training works and road embankments with stone, boulders, cement concrete blocks or stones in wire crates over a layer of granular material which will act as a filter. The rear slopes, not subjected to direct attack of the river, may be protected by 300 mm - 600 mm thick cover of clayey or silty earth and turfing.

2504.2 Pitching and Filter Medium

2504.2.1 Pitching

The pitching shall be provided with stones of thickness and shape as indicated on the drawings.

The stones shall be obtained from quarries and shall be sound, hard, durable and fairly regular in shape. Round boulders shall not be allowed. Stones showing marked deterioration by water or weather shall not be accepted.

The size and weight of stone shall conform to Clause 5.3.5.1 of IRC: 89. No stone, shall weigh less than 40 kg. The size of spalls shall be a minimum of 25 mm and shall be suitable to fill the voids in the pitching.

Where the stones of required size are not economically available, cement concrete blocks in minimum M15 grade concrete conforming to Section 1700 of these Specifications or stones in wire crates, shall be used.

Geosynthetics, if used in pitching, shall conform to Section 700 of these Specifications.

2504.2.2 Filter Medium

The material for the filter shall consist of coarse sand, gravel or stone. One or more layers of graded materials, to act as a filter medium, shall be provided underneath the pitching, to prevent loss of the embankment material and build up of uplift head on the pitching.

The gradation of the filter material shall satisfy the following requirements:

$$\frac{D_{15} \text{ (Filter)}}{D_{85} \text{ (Base)}} < 5$$

$$4 < \frac{D_{15} \text{ (Filter)}}{D_{15} \text{ (Base)}} < 20$$

$$\frac{D_{50} \text{ (Filter)}}{D_{50} \text{ (Base)}} < 25$$

Notes :

- 1) Filter design may not be required if embankment consists of CH or CL soils with liquid limit greater than 30, resistant to surface erosion. In this case, if a layer of material is used as bedding for pitching, it shall be well graded and its D 85 size shall be at least twice the maximum void size in pitching
- 2) In the foregoing, D 15 means the size of that sieve which allows 15 percent by weight of the filter material to pass through it and similar is the meaning of D 50 and D 85 (15 being replaced with 50 and 85 respectively).
- 3) If more than one filter layer is required, the same requirement as above shall be followed for each layer. The finer filter shall be considered as base material for selection of coarser filter.
- 4) The filter shall be compacted to a firm condition. The thickness of filter is generally of the order of 200 mm to 300 mm. Where filter is provided in two layers, thickness of each layer shall be 150 mm.

2504.3 Construction Operations

Before laying the pitching, the side of banks shall be trimmed to the required slope and profiles by means of lines and pegs at intervals of 3 m. Depressions shall be filled and thoroughly compacted.

The filter granular material shall be laid over the prepared base and compacted to the thickness specified on the drawings by means of suitable equipment.

The lowest course of pitching shall be started from the toe wall and built up in courses upwards. The toe wall shall be in dry rubble masonry (uncoursed) conforming to Clause 1405.3, of these Specifications in case of dry rubble pitching. It shall be in nominal mix cement concrete (M 15) conforming to Clause 1704.3, of these Specifications in case of cement concrete block pitching.

The stone pitching shall commence in a trench below the toe of the slope. Stone shall be placed by derrick or by hand to the required length, thickness and depth conforming to the drawings. Stones shall be set normal to the slope, and placed so that the largest dimension is perpendicular to the face of the slope, unless such dimension is greater than the specified thickness of pitching.

The largest stones shall be placed in the bottom courses and for use as headers for subsequent courses.

In hand placed pitching, the stone of flat stratified nature should be placed with the principal bedding plane normal to the slope. The pattern of laying shall be such that the joints are broken and voids are minimum by packing with spalls, wherever necessary, and the top surface is as smooth as possible.

When full depth of pitching can be formed with a single stone, the stones shall be laid breaking joints and all interstices between adjacent stones shall be filled in with spalls of the proper size wedged in with hammers to ensure tight packing.

When two or more layers of stones must be laid to obtain the design thickness of pitching, dry masonry shall be used and stones shall be well bonded. To ensure regular and orderly disposition of the full intended quantity of stone as shown, template cross walls in dry masonry shall be built about a metre wide and to the full height of the specified thickness at suitable intervals all along the length and width of the pitching. Within these walls the stones shall be hand packed as specified.

2504.4 Toe Protection

A toe wall shall be provided at the junction of slope pitching and launching apron of a guide bund so as to prevent the slope pitching from sliding down. The toe wall shall be in dry rubble masonry (uncoursed) conforming to Section 1400 of these Specifications or in cement concrete of M15 grade. The pitching/revetment shall be of stones in wire crates or cement concrete blocks in M15 grade. For protection of ties of bank slopes terminating either in short aprons at bed levels or anchored in flooring/rocky bed, the provision of Clause 8.2.2 of IRC:89 may be complied with.

2505 RUBBLE STONE/CEMENT CONCRETE BLOCK FLOORING OVER CEMENT CONCRETE BEDDING

2505.1 The work shall consist of constructing rubble stone/cement concrete block flooring laid over a bedding of cement concrete (M15).

sealant trimmed to receive the wearing coat. After the wearing coat is completed, similar sealant shall be provided to cover at least 50 mm on the wearing coat surface all round the drainage assembly.

2706 WEEP HOLES

Weep holes shall be provided on all plain concrete, reinforced concrete, brick masonry and stone masonry structures such as, abutment, wing wall and return walls as shown on the drawings or as directed by the Engineer to permit water to flow out without building up pressure in the back fill. Weep holes shall be provided with 100 mm diameter AC/PVC/HDPE pipe for structures in plain/reinforced concrete or brick masonry. In case of stone masonry, weep holes shall be of rectangular shape 80 mm wide, 150 mm high or circular with 150 mm diameter. Weep holes shall extend through the full width of concrete/masonry with slope of about 1 vertical: 20 horizontal towards the draining face. The spacing of weep holes shall be 1 m in either direction or as shown in the drawings with the lowest at 150 mm above the low water level or ground level whichever is higher or as directed by the Engineer.

2707 TESTS AND STANDARDS OF ACCEPTANCE

The material shall be tested in accordance with these Specifications and shall meet the prescribed criteria and requirements.

The work shall conform to these Specifications and shall meet the prescribed standards of acceptance.

2708 MEASUREMENTS FOR PAYMENT

The measurement for payment for wearing coat, railing/crash barrier, approach slab, drainage spout and weep holes shall be made as under:

- i) Bituminous and cement concrete wearing coat shall be measured in cubic metres. Steel reinforcement in wearing coat shall be measured in tonnes.
- ii) Railing and metal beam crash barriers shall be measured in running metres.
- iii) For concrete crash barriers concrete shall be measured in cubic metres and steel shall be measured in tonnes.
- iv) Approach slab and its base shall be measured separately in cubic metres.
- v) Drainage spouts shall be measured in numbers.

2901 SCOPE

This work shall consist of furnishing and installing reinforced cement concrete pipes, of the type, diameter and length as per design and details and at locations shown on the drawings or as ordered by the Engineer and in accordance with the requirements of these Specifications.

2902 MATERIALS

All materials used in the construction of pipe culverts shall conform to the requirements of **Section 1000**.

Each consignment of cement concrete pipes shall be inspected, tested, if necessary, and approved by the Engineer either at the place of manufacture or at the site before their incorporation in the works.

2903 EXCAVATION FOR PIPE

The foundation bed for pipe culverts shall be excavated true to the lines and grades shown on the drawings or as directed by the Engineer. The pipes shall be placed in shallow excavation of the natural ground or in open trenches cut in existing embankments, taken down to levels as shown on the drawings. In case of high embankments where the height of fill is more than three times the external diameter of the pipe, the embankment shall first be built to an elevation above the top of the pipe equal to the external diameter of the pipe, and to width on each side of the pipe of not less than five times the diameter of pipe, after which a trench shall be excavated and the pipe shall be laid.

Where trenching is involved, its width on either side of the pipe shall be a minimum of 150 mm or one-fourth of the diameter of the pipe whichever is more and shall not be more than one-third the diameter of the pipe. The sides of the trench shall be as nearly vertical as possible.

The pipe shall be placed where the ground for the foundation is reasonably firm. Installation of pipes under existing bridges or culverts shall be avoided as far as possible. When during excavation the material encountered is soft, spongy or other unstable soil, and unless other special construction methods are called for on the drawings or in special provisions, such unsuitable material shall be removed to such depth, width and length as directed by the Engineer. The excavation shall then be backfilled with approved granular material which shall be properly shaped and thoroughly compacted upto the specified level.

Where bed-rock or boulder strata are encountered, excavation shall be taken down to atleast 200 mm below the bottom level of the pipe with prior permission of the Engineer and all rock/ boulders in this area be removed and the space filled with approved earth, free from stone or fragmented material, shaped to the requirements and thoroughly compacted to provide adequate support for the pipe.

Trenches shall be kept free from water until the pipes are installed and the joints have hardened.

2904 BEDDING FOR PIPE

The bedding surface shall provide a firm foundation of uniform density throughout the length of the culvert, shall conform to the specified levels and grade, and shall be of one of the following two types as specified on the drawings :

- i) **First Class Bedding** : Under first class bedding, the pipe shall be evenly bedded on a continuous layer of well compacted approved granular material, shaped concentrically to fit the lower part of the pipe exterior for atleast ten percent of its overall height or as otherwise shown on the drawings. The bedding material shall be well graded sand or another granular material passing 5.6 mm sieve suitably compacted/rammed. The compacted thickness of the bedding layer shall be as shown on the drawings and in no case shall it be less than 75 mm.
- ii) **Concrete Cradle Bedding** : When indicated on the drawings or directed by the Engineer, the pipe shall be bedded in a cradle constructed of concrete having a mix not leaner than M 15 conforming to Section 1700. The shape and dimensions of the cradle shall be as indicated on the drawings. The pipes shall be laid on the concrete bedding before the concrete has set.

2905 LAYING OF PIPE

No pipe shall be laid in position until the foundation has been approved by the Engineer. Where two or more pipes are to be laid adjacent to each other, they shall be separated by a distance equal to at least half the diameter of the pipe subject to a minimum of 450 mm.

The arrangement for lifting, loading and unloading concrete pipes from factory/yard and at site shall be such that the pipes do not suffer any undue structural strain, any damage due to fall or impact. The arrangement may be got approved by the Engineer.

Similarly, the arrangement for lowering the pipe in the bed shall be got approved by the Engineer. It may be with tripod-pulley arrangement or simply by manual labour in a manner that the pipe is placed in the proper position without damage.

The laying of pipes on the prepared foundation shall start from the outlet and proceed towards the inlet and be completed to the specified lines and grades. In case of use of pipes with bell-mouth, the belled end shall face upstream. The pipes shall be fitted and matched so that when laid in work, they form a culvert with a smooth uniform invert.

Any pipe found defective or damaged during laying shall be removed at the cost of the Contractor.

2906 JOINTING

The pipes shall be jointed either by collar joint or by flush joint. In the former case, the collars shall be of RCC 150 to 200 mm wide and having the same strength as the pipes to be jointed. Caulking space shall be between 13 and 20 mm according to the diameter of the pipe. Caulking material shall be slightly wet mix of cement and sand in the ratio of 1:2 rammed with caulking irons. Before caulking, the collar shall be so placed that its center coincides with the joint and an even annular space is left between the collar and the pipe.

Flush joint may be internal flush joint or external flush joint. In either case, the ends of the pipes shall be specially shaped to form a self centering joint with a jointing space 13 mm wide. The jointing space shall be filled with cement mortar, 1 cement to 2 sand, mixed sufficiently dry to remain in position when forced with a trowel or rammer. Care shall be taken to fill all voids and excess mortar shall be removed.

For jointing pipe lines under light hydraulic pressure, the recess at the end of the pipe shall be filled with jute braiding dipped in hot bitumen or other suitable approved compound. Pipes shall be so jointed that the bitumen ring of one pipe shall set into the recess of the next pipe. The ring shall be thoroughly compressed by jacking or by any other suitable method.

All joints shall be made with care so that their interior surface is smooth and consistent with the interior surface of the pipes. After finishing, the joint shall be kept covered and damp for at least four days.

2907 BACKFILLING

Trenches shall be backfilled immediately after the pipes have been laid and the jointing material has hardened. The backfill soil shall be clean, free from boulders, large roots, excessive amounts of sods or other vegetable matter, and lumps and shall be approved by the Engineer. Backfilling upto 300 mm above the top of the pipe shall be carefully done and the soil thoroughly rammed, tamped or vibrated in layers not exceeding 150 mm, particular care being taken to thoroughly consolidate the materials under the haunches of the pipe. Approved pneumatic or light mechanical tamping equipment can be used.

Filling of the trench shall be carried out simultaneously on both sides of the pipe in such a manner that unequal pressures do not occur.

In case of high embankment, after filling the trench upto the top of the pipe in the above said manner, a loose fill of a depth equal to external diameter of the pipe shall be placed over the pipe before further layers are added and compacted.

2908 HEADWALLS AND OTHER ANCILLARY WORKS

Headwalls, wing walls, aprons and other ancillary works shall be constructed in accordance with the details shown on the drawings or as directed by the Engineer. Masonry for the walls shall conform to Sections 1300, 1400 or 1700 as applicable. Aprons shall conform to Section 2500.

2909 OPENING TO TRAFFIC

No traffic shall be permitted to cross the pipes unless height of filling above the top of the pipes is atleast 600 mm.

2910 MEASUREMENTS FOR PAYMENT

RCC pipe culvert shall be measured as complete work in linear metres along its length between the inlet and outlet ends. Culverts with multiple rows of pipes shall be measured as one unit, irrespective of the number of rows.

2911 RATE

The Contract unit rate for the pipe culvert shall include the cost of pipes including loading, unloading, hauling, handling, storing, laying in position and jointing and all ancillary works such as excavation, bedding for pipes, backfilling, concrete, masonry and aprons and incidental costs to complete the work as per these Specifications.

3101 SCOPE

The work covers construction of reinforced soil structures together with the construction of earthwork in layers, assembly and placing of reinforcing elements and fascia elements during the construction process and all associated works.

The work shall include the design and construction of the reinforced soil structure and ground improvement measures required, if any.

The reinforced soil retaining structures can be used as, (i) Reinforced soil retaining wall, (ii) Reinforced soil abutment, (iii) Reinforced soil slope

Reinforced soil structures with slope face angles steeper than 70° are categorized as reinforced soil walls and those with slope face angle less than 70° are considered as reinforced soil slopes.

3102 DESIGN

Guidelines for design are given in Annexure-1.

3103 REINFORCING ELEMENT

3103.1 The reinforcing element shall be metallic in the form of strips (aluminum alloy strip, copper strip, carbon steel strip, galvanised steel strip, stainless steel strip, ladder) or mats of metal (steel grids, woven and welded steel wire meshes) or synthetic (PET, HDPE, PVA, PP) reinforcement in the form of grid or strip or strap or combination of metallic or synthetic or any other proprietary material which may be approved by the Engineer and shown on the drawings

3103.2 Aluminum alloy strip shall comply with BS:1470 quality 5454 in the H 24 condition.

3103.3 Copper strip shall comply with BS:2870 quality C 101 or C 102 in the ½ H condition and shall have 0.2 percent proof stress of not less than 180 N/mm².

3103.4 Carbon steel strip shall comply with BS EN 10025 or IS:2062 and have a silicon content of not more than 0.55 percent. The fabricated element shall be galvanized in accordance with IS:4759 and IS:2629 and the minimum zinc coating weight shall not be less than 1000gm/sq.m

The steel strips with minimum bearing and shear strength of 490N/mm² shall comply with the requirements of BS EN 10025, Grade S 355 JR, or IS:2062 grade Fe 490, except the elongation (on base metal) for which minimum 22 percent is acceptable.

The panel lugs shall be manufactured from hot-rolled steel strips with the same steel quality and grades as specified above, except that the minimum zinc coating weight not less than 600 gm/sq.m.

All permanent metallic connectors (exposed to soil), tie strips and lugs shall be hot dip galvanized. Nuts/ bolts (fasteners) shall be galvanized as per requirements of IS: 1367-Part 3. Nuts/ bolts (fasteners) shall be of grade 10.9.

For all metallic components, where holes or penetrations are made through the reinforcing elements to accommodate connection such as bolts, pins, or other, the cross section thickness and/or width of metallic component shall be increased to account for section loss caused by the hole or penetration.

3103.5 Stainless steel strip shall comply with BS: 1449 (Part 2) quality 315 S 31 or 316 S 33 except that the material shall be cold rolled to provide a 0.2 percent proof stress of not less than 400 N/mm² and the tensile strength shall not be less than 540 N/mm².

3103.6 All metallic components buried in soil shall be of electrolytically compatible materials.

3103.7 Geotextile, Geogrids and other Geosynthetic Materials used as Reinforcing Elements

3103.7.1 Geotextile

High strength high tenacity geotextile fabrics used as reinforcement in the construction of reinforced slopes or in the base of reinforced soil structure as reinforcement, shall be considered as reinforcing element and shall satisfy all the requirements stipulated for geosynthetic reinforcing elements, in Clause 3103.7.2.

Geotextile fabric used for separation, filtration and/ or drainage shall satisfy the requirements given in relevant Clauses of Section 700 Geosynthetics.

3103.7.2 Geogrids

The manufacturer of geogrids, geotextiles, geostrips, polymeric strips or straps, polymeric ties or any other geosynthetic material, including any proprietary geosynthetic material, for use as reinforcing element shall fulfill the following requirements:

- a) Shall have ISO (ISO-9001) or CE Certification for manufacturing process and quality control, and
- b) The product shall have certification for use as soil reinforcing material from an agency accredited for certifying geosynthetic reinforcement products.

- c) The manufacturer shall provide test reports from an independent laboratory with valid accreditation, for all the tests needed to establish all the reduction factors listed below

| | |
|-------------|---|
| RF_{CR} - | Reduction factor for creep. |
| RF_{ID} - | Reduction factor for installation damage |
| RF_W - | Reduction factor for weathering |
| RF_{CH} - | Reduction factor for chemical/ environmental effects. |
| f_s - | Factor for the extrapolation of data |

All the above factors shall be determined in accordance with the provisions of ISO/TR 20432- "Guide to the determination of long-term strength of geosynthetics for soil reinforcement."

Project Specific Tests/Data

Test for the ultimate tensile strength shall be carried out on a random sample for each grade of reinforcement as per ISO-10319. The test results shall be accompanied by stress-strain curves showing strength at 2% and 5% strain and strain/elongation at failure.

The manufacturer shall also provide the results of ultimate tensile strength for each lot and all grades of reinforcement proposed for use in the project.

Annual Average Daily Temperatures (AADT)/design temperature of the project site shall be worked out and values of reduction factor for creep RF_{CR} and for RF_{CH} shall be provided as per procedures given in ISO/TR-20432.

Tests shall be carried out to provide values of

- i) Pull-out coefficient as per ASTM D 6706 "Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil" and
- ii) Coefficient of interaction between reinforced fill soil and geogrids as per ASTM D 5321-"Standard Test method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear method" or as per IS: 13326: Part 1-1992 "Method of test for the evaluation of interface friction between geosynthetics and soil: Part 1 Modified direct shear technique" for all types of geogrids.

One set of project specific tests shall be conducted at third party accredited laboratory or at a reputed institute.

Each roll shall have at least one identification label with roll number and product type.

3104 EARTH FILL

The fill material in the reinforced soil zone shall have drained or effective angle of friction not less than 30° , measured in accordance with IS:2720 (Part 13), by conducting a drained direct shear test. In case the fill material has 25 percent or more particles of 4.75 mm or larger, drained shear test using large shear box may be conducted (IS:2720:Part 39:Section 1). The gradation of fill soil shall be as per following limits.

| Sieve Size | Percentage Passing |
|-------------|--------------------|
| 75 mm | 100% |
| 425 micron | 0-60% |
| 75 micron | less than 15 |
| PI ≤ 6 | |

Materials with more than 15 percent passing 75 micron sieve, but less than 10 percent of particles smaller than 15 microns are acceptable provided PI is less than 6 and angle of friction is not less than 30° .

Fly ash may be used as fill material in reinforced soil walls provided its angle of internal friction is not less than 30° and PI is less than 6. Gradation requirements need not be completely satisfied. Reference may be made to IRC Guide lines on Use of Flyash in Road Embankments (IRC:SP-58). Fly ash shall also satisfy requirements concerning pH and environmental conditions of the fill vis-à-vis the reinforcement type as specified in Clause 3014.1.

The fill material used in the reinforced soil zone shall be free from organic or other deleterious materials and shall not react adversely (chemically, electrically or biologically) with the reinforcement material and/or facing material.

Properties of fill soil in the reinforced zone, unreinforced zone (or retained/back fill) soil and the foundation soil shall be determined accurately during the construction phase, as per quality assurance plans and directions of Engineer so as to ensure that these are the same as those considered in the design phase.

The fill soil in the unreinforced zone shall conform to the requirements specified in the design.

3104.1 Environmental Conditions of Fill**3104.1.1 Steel Reinforcement**

Where galvanized steel reinforcement is used, the fill material shall be free draining granular material and shall meet the following requirements as per Table 3100.1.

Table 3100.1 : Recommended Limits of Electrochemical Properties for Reinforced Fills with Steel Reinforcement

| Property | Criteria | Test Method |
|-------------|---------------|--------------|
| Resistivity | > 3000 ohm-cm | AASHTO T-288 |
| pH | > 5 and < 10 | AASHTO T-289 |
| Chlorides | < 100 PPM | ASTM D 4327 |
| Sulphates | < 200 PPM | ASTM D 4327 |

3104.1.2 Geosynthetic Reinforcement

Where geosynthetic reinforcement is used for reinforcing elements manufactured from polyester yarn, pH value of the fill material shall be between 3 and 9, and for reinforcing elements manufactured from PVA, PP and HDPE, the pH value shall be greater than 3.

3105 FACIA MATERIAL**3105.1** The facing system shall be one of the following

- a) Precast reinforced concrete panels
- b) Precast concrete blocks and precast concrete hollow blocks.
- c) Gabion facing
- d) Wrap around facing using geosynthetics
- e) Metallic facing, prefabricated in different shapes including welded wire grid and woven steel wire mesh
- f) Other proprietary and proven systems

Facing shall be sufficiently flexible to withstand any deformation of the fill and foundations.

The facia units to be adopted in the project shall be shown in the drawings and shall be approved by the Engineer.

3105.1.1 Precast Reinforced Concrete Panels

The minimum thickness of precast concrete panels shall be 180 mm including facing textures, logos and embellishments. The grade of concrete shall be minimum M35. The concrete shall conform to the requirements of Section 1700 of these Specifications.

Facia panel systems shall have provision of both horizontal and vertical gaps to prevent concrete to concrete contact. The horizontal gap between the facing elements shall be maintained by provision of Ethylene Propylene Diene Monomer (EPDM) pad. Bedding

SPECIFICATIONS FOR BRIDGE WORKS

Name of Work _____

_____ Department

_____ Circle

_____ Division

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Schedule "B" of the tender

Sr. No. of the applicable
enclosed specification .

| | | | |
|-----|-----|-----|-----|
| 1. | *** | *** | *** |
| 2. | *** | *** | *** |
| 3. | *** | *** | *** |
| 4. | *** | *** | *** |
| 5. | *** | *** | *** |
| 6. | *** | *** | *** |
| 7. | *** | *** | *** |
| 8. | *** | *** | *** |
| 9. | *** | *** | *** |
| 10. | *** | *** | *** |
| 11. | *** | *** | *** |
| 12. | *** | *** | *** |
| 13. | *** | *** | *** |
| 14. | *** | *** | *** |
| 15. | *** | *** | *** |
| 16. | *** | *** | *** |
| 17. | *** | *** | *** |
| 18. | *** | *** | *** |
| 19. | *** | *** | *** |
| 20. | *** | *** | *** |
| 21. | *** | *** | *** |
| 22. | *** | *** | *** |
| 23. | *** | *** | *** |
| 24. | *** | *** | *** |
| 25. | *** | *** | *** |
| 26. | *** | *** | *** |
| 27. | *** | *** | *** |
| 28. | *** | *** | *** |
| 29. | *** | *** | *** |
| 30. | *** | *** | *** |
| 31. | *** | *** | *** |
| 32. | *** | *** | *** |
| 33. | *** | *** | *** |
| 34. | *** | *** | *** |
| 35. | *** | *** | *** |

GENERAL TECHNICAL SPECIFICATIONS

1. General:

All measurements shall be made in the metric system. Different items of work shall be measured in accordance with the procedures set forth in the relevant specifications read in conjunction with General Conditions of Contract. The same shall not, however, apply in the case of lump-sum items. All measurements and computations, unless otherwise, indicated, shall be carried nearest to the following limits :

- | | |
|--|-----------------|
| (i) Length and breadth | 10mm |
| (ii) height, depth or thickness of earthwork, sub-base, bases, surfacings and structural members | 05 mm |
| (iii) areas | 0.01 Sq.Mtrs. |
| (iv) cubic contents | 0.01 Cubic Mtr. |

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

2. Measurements of lead for materials

Where lead is specified in the contract, the same shall be deemed to mean as described hereunder.

Lead shall be determined on the bases of the shortest practicable route and not the one actually taken and the decision of the Engineer-in-charge in this regard shall be taken as final. Distances upto and including 100 metres shall be measured in units of 50 metres exceeding 100 metres but not exceeding 1 km. in units of 100 metres, and exceeding 1 km. in units of 500 metres. The half and greater than half of the units shall be reckoned as one and less than half of the units ignored. In this regard, the source of the material shall be divided into suitable blocks and for each block the distance from the centre of the block to the centre of placing pertaining to that block shall be taken as the lead distance. Where no lead is specified, it shall mean all lead.

3. Surface Regularity

The surface regularity of completed wearing surfaces in the longitudinal and transverse directions shall be within the tolerances indicated in Table below. The longitudinal profile shall be checked with a 3 metre long straight edge, at the middle of each traffic lane along a line parallel to the centre of the road. The transverse profile shall be checked with a set of three camber boards at intervals of ten metres.

| PERMITTED TOLERANCES OF SURFACE REGULARITY FOR PAVEMENT COURSES | | | | |
|---|-------------------------|---|--|--|
| Sr. No. | Type of Construction | Longitudinal profile with 3 metre No. straight edge | | Cross Profile |
| | | Maximum Permissible undulations mm. | Maximum number of Undulations permitted in any 300 metres length exceeding 6 mm. | Maximum Permissible variation from specified profile under camber template mm. |
| 1. | Bituminous wearing coat | 15 | 20@ | 6 |

Notes. 1. @ These are for machine laid surfaces. If laid manually, tolerance upto 50 percent above these values in this column may be permitted. However this relaxation does not apply to the value of maximum undulation for longitudinal and cross profiles mentioned in columns 3 and 4 on the table.

2. Surface evenness requirements in respect of both the longitudinal and cross profiles should be simultaneously satisfied.

3.1 Rectification :

Where the surface irregularity fall outside the specified tolerances, the contractor shall be liable to rectify these in the manner described below and to the satisfaction of the Engineer-in-charge at his own cost.

3.2 Bituminous Constructions :

For bituminous constructions, for wearing course, where the surface is high or low, the full depth of the layer shall be removed and replaced with fresh material and compacted to specifications. In all cases where the removal and replacement of a bituminous layer is involved, the area treated shall not be less than 5 metres long and less than 1 lane wide.

4. Quality control tests during Construction :

The materials supplied and the works carried out by the Contractor shall conform to the enclosed relevant specifications. For ensuring the requisite quality of construction, the materials and works shall be subjected to quality control tests, as described here in after, by the Engineer-in-charge. Test procedures for the various quality control test are indicated in the respective sections of the Specifications or for certain tests within this section. Where no specific testing procedure is mentioned, the test shall be carried out as per the prevalent accepted Engineering practice to the directions of the Engineer-in-charge.

5. Following materials shall conform to the Indian Standards shown "Against Them":

| | |
|--|--------------------------|
| (1) Cement | IS : 269 |
| (2) Sand for Masonary | IS : 2116 |
| (3) Sand for Concrete | IS : 383 |
| (4) Coarse aggregate | IS : 383 |
| (5) Mild Steel | IS : 432 |
| (6) High yield strength deformed bars- | |
| (a) Hot Rolled | IS : 1139 |
| (b) Cold Twisted | IS : 1786 |
| (7) Cast Steel | IS : 1030 |
| (8) Cast Iron | IS : 210 |
| (9) Structural Steel- | |
| (a) Mild Steel | IS : 226 |
| (b) H. T. Steel | IS : 961 |
| (c) Fusion welding quality steel | IS : 2062 |
| (d) Rivet steel | IS : 1148 or |
| | IS : 1149 as applicable. |
| (10) H.T. Steel | IS : 1785 |
| (11) Greese | IS : 1002 |
| (12) Electrodes for metal or welding of N.J. | IS : 814 |

Item 1 - Dismantling (Road and Bridge items)

1. This work shall consist of removing, as here in after set forth, existing culverts, bridges, pavements, kerbes and other structures like guard- rails, fences utility poles, manholes, catch basins, inlets, etc. Which are in place but interfere with the new construction or are not suitable to remain in place, and of salvaging and disposing of the resulting materials and back filling the resulting trenches and pits.

2. Existing culverts, bridges, pavements and other structures which are within the highway and which are designated to be removed shall be removed upto the limits and extent specified in the drawings or as indicated by the Engineer-in-charge.

3. Dismantling and removal operations shall be carried out with such equipment and in such a manner as to leave undisturbed, adjacent pavement, structures and any other work to be left in place.

4. All operations necessary for the removal of any existing structure which might endanger new construction shall be completed prior to the start of new work.

5. The structures shall be dismantled carefully and the resulting materials so removed as not to cause any damage to the serviceable materials to be salvaged, the part of the structure to be retained and any other properties or structures nearby.

6. Unless otherwise specified, the superstructure portion of culverts/bridges shall be entirely removed and other parts removed to below the ground level or as necessary depending upon the interference they cause to the new construction. Removal of overlying or adjacent material if required in connection with the dismantling of the structures, shall be incidental to this item.

7. Where existing culverts/bridges are to be extended or otherwise incorporated in the new work, only such part of the existing structure shall be removed as are necessary to provide a proper connection to the new work. The connecting edges shall be cut chipped and trimmed to the required lines and grades without weakening or damaging any part of the structure to be retained. Reinforcing bars which are to be left in place so as to project into new work as dowels or ties shall not be injured during removal of concrete.

8. Pipe culverts shall be carefully removed in such a manner to avoid damage to the pipes..

9. Steel structures shall unless otherwise provided be carefully dismantled in such a manner as to avoid "damage to members thereof. If specified in the drawing or directed by the Engineer-in-charge that structure is to be removed in a condition suitable for re-erection, all members shall be match marked by the contractor with white lead paint before dismantling end pins, nuts, loose plates, etc. shall be similarly marked to indicate their proper location, all pins, pin holes and machined surfaces shall be painted with a mixture of white lead and tallow and all loose parts shall be securely wired to adjacent members or packed in boxes.

10 Timber structures shall be removed in such a manner as to avoid damage to such timber or lumber as is designated to be salvaged by the Engineer-in-charge.

11. In removing pavements, kerbs, gutters and other structures like guard rails, fences, manholes, catch basins, inlets, etc. where portions of the existing construction are to be left in the finished work the same shall be removed to an existing joint or out and chipped to a true line with a face perpendicular to the surface of the existing strata. Sufficient removal shall be made to provide for proper grades and connections with the new work as directed by the Engineer-in-charge.

12. All concrete pavements, base course in carriage way and shoulders etc. designated for removal shall be broken to pieces whose volume shall not exceed 0.02 cubic metre and stockpiled at designated locations if the material is to be used later or otherwise arranged for disposal as directed.

13. Where directed by the Engineer-in-charge holes and depressions caused by dismantling operations shall be backfilled with excavated or other approved material and thoroughly compacted in line with surrounding area.

14. All materials obtained by dismantling shall be the property of Government. Unless otherwise specified, materials having any salvage value shall be placed in neat stacks of like material within the right-of-way as directed by the Engineer-in-charge, for which Contractor will remain responsible for its safe custody and preservation for 60 days after recording measurements of the salvaged material.

15. Pipe culverts that are removed shall be cleared and neatly piled on the right-of way at points designated by the Engineer-in-charge.

16. Structural steel removed from old structure shall, unless otherwise specified or directed, be stored in a neat and presentable manner. Structures or portions thereof which are specified in the contract for re-erections shall be stored in separate piles.

17. Timber or lumber from old structure which is designated by the Engineer-in charge as materials to be shall have all nails and bolts removed there from and shall be stored in neat piles locations suitable for loading.

18. All the products of dismantling operations which in the opinion of the Engineer-in-charge cannot be used or auctioned shall be disposed as directed, within 100 metres.

19. The work of dismantling structures shall be paid for in units indicated below by taking measurements before and after, as applicable :

| | |
|---|--------------|
| (i) Dismantling brick/concrete (Plain and Reinforced) masonry | Cubic Metre |
| (ii) Dismantling flexible and cement concrete pavement. | Cubic Metre |
| (iii) Dismantling steel structure. | Tonne |
| (iv) Dismantling timber structure. | Cubic Metre |
| (v) Dismantling pipes, guard rails, kerbs, gutters and fencing. | Linear Metre |
| (vi) Utility poles. | Nos. |

20. The contract unit rates for the various items of dismantling shall be payment in full for carrying out the required operations including full compensation for all labour, materials, tools, equipment, safeguards and incidentals necessary to complete the work. These will also include excavation and backfilling where necessary and for handling, salvaging, piling and disposing of the dismantles materials within all lifts and upto a lead of 100 metres.

Item-2 Painting flood Gauge Marks on Sub-structure

1. The width of the flood gauge shall be 60 cm and will have caneri yellow background colour. The flood gauge marking will be in 10 cm. thick strips of alternative black and white colour. The width of the strip shall be as under :-

| | |
|---------------------|-----------------------|
| (a) At every 10 cm. | 15cm. width |
| (b) At every 1/2 m. | 25 cm, width in black |
| (c) At every metre | 35 cm. width in white |

The lettering shall be in black colour and of 10 cm. height. The lettering shall show every metre and 1/2 m. level. The lettering shall show levels based on either GST B.M. or Arbitrary B.M. as furnished by Engineering-in-charge.

2. All the painting work shall be done in 3 coats. The paint shall be of approved make.

3. The measurement for payment shall be on running meter basis measured vertically in height.

4. The unit rate includes the cost of materials, labour, painting, equipment if any to complete the work.

Item-3 Providing Masonary Steps With Cement Pointing

1. Stones subject to mark deterioration will not be accepted. The stone shall be sound, hard, durable and fairly regular in shape and its thickness in any one direction shall not be less than 15 cm.

2. Before laying the stones, the slope of embankment shall be trimmed to the required profile put up by means of line and pegs to receive the steps and kerb on it. Depression shall be filled and thoroughly compacted. The width of the tread shall be 30 cm. (clear) and shall extend further 15 cm. below next tread, thickness of the stone work of the tread shall depend upon the slope of the embankment as under :-

| | |
|------------------|--------|
| (a) Slope 1 to 2 | 15 cm. |
| (b) Slope 1 to 3 | 10cm. |

The thickness of the stones work shall be uniform throughout and shall not be less than the height of the riser depending upon the slope of the embankment as stated above. There shall not be more than 3 stones in the total 45 cms. width of the tread.

3. Kerb of 15 cm. width & 25 cm. depth, flush with the embankment slope line shall be provided to prevent spilling of earth on the steps. Width of the steps between the kerbs shall be 90

cms. Unevenness and voids shall be filled with quarry spalls and exposed faces of the tread riser and kerb of the stones work shall be cement pointed in proportion as specified so that they are stable and remain in line and level. For cement pointing relevant specifications of that item shall apply.

4. The unit rate includes the cost of material, labour and tools including cement pointing to complete the work.

Item-4 Providing intermedia behind abutment etc.

1. Well graded pebbled or metal of 40 mm. to 63 mm. size shall be used. The grading and tolerances of metal of pebbles shall be as under:-

| Sr. No. | No. of Size Range | Sieve designation | Percentage by weight passing through the sieve. |
|---------|-------------------|-------------------|---|
| 1. | 63 mm. to 40 mm. | 90 mm. | 100-00 |
| | | 63 mm | 85-100 |
| | | 50 mm. | 35-70 |
| | | 40 mm. | 00-15 |
| | | 20 mm. | 00-05 |

The size shall be 40 mm. to 63 mm. where in tolerance limit for over size shall be upto 15% and that for lower size should be upto 15% and below 20 mm. it shall be allowable upto 5%. The filter Material shall be tightly placed to a thickness of not less than 600 mm. and provided over the entire surface behind abutments, wings or return walls to the full height.

2. Materials shall be first stacked in boxes of 2 m. x 1 ½ m. x 0.5m. size on fairly level ground and measured.

3. The measurement for payment shall be made on Cmt. basis of boxes. No deduction shall be made for voids.

4. The unit rate includes the cost of materials, scaffolding labour and tools to complete the work.

Item-5-A Filling rubbles between returns and behind abutment

1. Stone subject to marked deterioration by water or weather will not be accepted. The stone shall be sound, hard, durable and fairly regular in shape and its thickness in any one direction shall not be less than 15 cm. The largest stones procurable shall be supplied on site. The size of spalls shall be minimum 25 mm. and shall be suitable to fill voids.

2. Stones shall be filled in layers of 23 cms. to 30 cms. thickness and all interstices between adjacent stones shall be filled with 20 per cent spalls of proper size and wedged in with hammers to ensure tight packing.

3. Stones shall be first stacked in rectangular chattas on fairly level ground and measured. Artificial voids should not be left in side the chattas.

4. The measurement for payment shall be made on cmt. basis of chatta of rubbles only. No deduction shall be made for voids. Chattas for spalls shall be made separately and shall be measured for record purpose only and shall not be paid for.

5. The unit rate includes the cost of materials, labour & tools to complete the work,

Item 5-B-Providing rubble for apron

1. The work shall consist of laying boulders directly on the prepared surface for protection against scour.

2. The stones used in apron shall be sound, hard, durable & fairly regularly in shape. Stone subject to marked deterioration by water or weather shall not be used. The thickness and shape of apron shall be as indicated on the drawings or as directed by the Engineer-in-charge. The surface on which the apron is to be laid shall be levelled and prepared for the length and width as shown on

the drawings. The size of stone shall be as large as possible & weight shall be as specified in the item but in no case any fragment shall weight less than 40 Kg. The specific gravity of stone shall be as high as possible and it shall not be less than 2.50. To ensure regular and orderly disposition- of the full intended quantity of stone in the apron, template cross walls in dry masonry shall be built about a metre wide and to the full hight of the specified thickness of the apron at intervals of 30 metres and all along the length and width of the apron. Within these walls, the stone then shall be hand-packed.

3. Payment shall be made on CMT basis of chatta. The materials shall have to be stacked at site before laying. Preparation of base, or laying bedding shall be deemed incidental to the work Nothing shall deducted for voids.

4. The rate shall include cost of materials, labour & tools to complete the job.

Item 6-Fhiling with sand (a) between returns., (B) between top and bottom plug (C) below raft foundations.

1. The sand to be used for filling shall be coarse, granular, clean, free from dust and deleterious matters obtained from a source as approved by the Engineer-in-charge. Sand between returns shall confirm to I.S. : 383.

Coarse aggregate: 10 mm, 12.5 mm, 16 mm, 20 mm, 40 mm & 63 mm

2. After the bottom plug has been laid and tested for leakage the level of its top shall be ascertained and recorded and the well shall be filled with sand under water in suitable layers not exceeding 30 cm. at a time and each layer well compacted by rodding to maximum density upto the level of the underside of the plug as per detailed drawing or as directed by the Engineer-in-charge.

3. Sand between returns and below raft foundations shall be filled in suitable layers not exceeding 30 cms. at a time and each layer shall be well compacted.

4. Mode of measurement shall be the total cubical content (in cmt.) of the area covered by sand filling.

Item 7-Excavation for foundation in all sorts of soils and murrum including dewatering

1. Excavation for structures shall consist of the removal of material for the construction of foundations for bridges, culverts, retaining walls, headwalls, cut off walls, pipe culverts and other similar structures, in accordance with the requirements, of these specifications and the lines and dimensions shown on the drawings or as indicated by the Engineer-in-charge. The work shall be include all necessary sheeting, shoring, bracing, draining and pumping and the removal of all logs, stumps, shrubs, and other deleterious matter and obstruction necessary for the foundations, trimming bottoms of excavations; back filling and clearing up th3 site and the disposal of all surplus material.

2. After the site has been cleared the limits of excavation shall be sot out true to lines, curves, slopes, grades and sections as shown on the drawings or as directed by the Engineer-in-charge. The contractor shall provide all labour, survey instruments and materials such as strings, pegs nails bamboos, stones, lime, mortar, concrete, etc. required in connection with the siting out of works and the establishment of bench mark, centre line stones and other marks and stakes as long as in the opinion of the Engineer-in-charge, they are required for the work.

3. Excavation shall be taken to the with of the lowest step of the footing. The contractor at his own expense shall put up necessary shoring, strutting and planking or cut slopes to a safer angle or both with due regard to the safety of personal and works and to the satisfaction of the Engineer-in-charge.

4. The depth to which the excavation is to be carried out shall be is shown on the drawings, unless the type of material encountered is such as to require changes, in which case the depth shall be as ordered by the Engineer-in-charge.

5. Where water is met with in excavation due to stream flow, seepage, springs, rain or other reasons, the contractor shall take adequate measures such as bailing pumping, to keep the foundation trenches dry when so required and to protect the green concrete/masonry against

damage by erosion or sudden rising of water level. The methods to be adopted in this regard and other details thereof shall be left to the choice of the contractor but subject to approval of the Engineer-in-charge. Approval of the Engineer in-charge shall, however not relieve the contractor of the responsibility for the adequacy of dewatering, and production arrangements and for the quality and safety of the works.

6. pumping from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of movement of water through any fresh concrete. No. pumping shall be permitted during the placing of concrete or for any period of at least 24 hours thereafter, unless it is done from a suitable sump separated from the concrete work by a water tight wall or other similar means.

7. The bottom of the foundation shall be levelled both longitudinally and transversely or stepped as directed by the Engineer-in-charge. Before footing is laid, the surface shall be slightly watered and rammed. In the event of excavation having been made deeper than that shown on the drawings or as otherwise ordered by the Engineer-in-charge, the extra depth shall be made up with concrete or masonry of the foundation grade at the cost of the contractor. Ordinary filling shall not be used for the purpose to bring the foundation to level. If there are any slips or blows in the excavation, these shall be removed by the contractor at his own cost.

8. Near towns, villages and all frequented places, trenches and foundation pits shall be securely fenced, provided with proper caution signs and marked with red lights at night to avoid accidents. The contractor shall take adequate protective measures to see that the excavation operations do not affect or damage adjoining structures.

9. Backfilling shall be done with approved materials after concrete or masonry is fully set and carried out in such a way as not to cause undue thrust on any part of the structure. All space between foundation masonry or concrete and the sides of excavation shall be refilled to the original surface, making due allowance for settlement in 250 mm. loose layers, which shall be watered and compacted.

10. All the excavated materials shall be the property of the Government. Where the excavated materials is to be used in the construction of embankment, it shall be directly deposited at the required location, within 100 metres lead.

11. All useful materials not intended for use in the bank, shall be stacked neatly on Government land as directed by the Engineer-in-charge within 100 metres lead. Unsuitable and surplus materials not intended for use shall be disposed off as directed by the Engineer-in-charge.

12. Excavation for structures shall be measured in cubic metres for each class of materials encountered, limited to the dimensions shown on the drawing or as directed by the Engineer-in-charge. Excavation over increased width cutting of slopes, shoring, shuttering and planking shall be deemed as convenience for the contractor in executing the work and shall not be measured and paid for separately.

13. The contract unit rate for the items of excavation for structures shall be paid in full for carrying out the required operations including :-

1. Setting out and fixing bench marks and centre lines stones.
2. Construction of necessary shoring and bracing and their subsequent removal.
3. Removal of all logs, stumps, Grubs and other deleterious matter and obstructions for placing the foundations including trimming of bottoms of excavations;
4. Foundation sealing, dewatering including pumping;
5. Backfilling, Clearing up the site and disposal, of all surplus material within all lifts and lead upto 100 metres;
6. All labour, materials, tools equipment, safeguards and incidentals necessary to complete the work to the specification.

14. Excavation shall be for ordinary soil such as vegetation or organic soil, turf, sand, silt, loam, clay, mud, black cotton soil, soft shale or soft murrum, a mixture of these and similar material which yields to the ordinary application of pick and shovel, or other ordinary digging equipment. Removal of gravel or any other nodular material having diameter in any one direction not exceeding 75 mm. occurring in such strata shall be deemed to be covered under this category. The classification

of excavation shall be decided by the Engineer-in-charge and his decision shall be final and binding on the contractor.

Item 8- Excavation for foundation in hard murrum and boulders including dewatering.

1 to 13. Para 1 to 13 of the item of excavation for foundation in all sorts of soil shall apply.

14. Excavation shall be in hard soil such as stiff heavy clay, hard shale or compact murrum requiring grating tool or pick or both and shovel, closely applied and gravel and rubble stone having maximum diameter in any one direction between 75 and 300 mm. and soft conglomerate. The classification of excavation shall be decided by the Engineer in -charge and his decision shall be final and binding on the contractor.

Item 9- Excavation for foundations in large boulders and soft rock without blasting including dewatering.

1 to 13. Para 1 to 13 of the item of excavation for foundation in all sorts of soil shall apply.

14. Excavation shall be in soft rock or such as lime stone, sand stone, laterite, hard conglomerate or other soft or disintegrated rock which may be quarried or split with crow bars, boulders which do not require blasting having diameter in any direction of more than 300 mm. and any rock which in dry state may be hard, requiring blasting but which when wet become soft and manageable by means other than blasting. The classification of excavation shall be decided by the Engineer-in-charge and his decision shall be final and binding on the contractor.

Item 10 Excavation for foundation in hard rock including dewatering.

(A) Requiring blasting (B) Blasting prohibited

1 to 13. Para 1 to 13 of the item of excavation for foundation in all sorts of soil shall apply.

14. Excavation shall be in any rock or boulders having diameter in any one direction of more than 300 mm. for which the use of mechanical plant or blasting is required. The classification of excavation shall be decided by the Engineer-in-charge and his decision shall be final and binding on the contractor. Merely the use of explosive in excavation will not be considered as a reason for higher classification unless blasting is clearly necessary in the opinion of the Engineer-in-charge.

15. Where blasting is prohibited for any reason, excavation shall be carried out by chiseling, wedging or any other approved method.

16. Blasting shall be carried out only with the written permission of the Engineer-in-charge. All the statutory laws, regulations, rules, etc. pertaining to the acquisition, transport, storage, handling and use of explosives shall be strictly followed.

17. The contractor may adopt any method or methods of blasting consistent with the safety and job requirements, after approval from the Engineer-in-charge.

18. The magazine for the storage of explosives shall be built to the design and specifications of the Explosives Department concerned and located at the approved site. No unauthorized person shall be admitted into the magazine which when not in use shall be kept securely locked. No matches or inflammable material shall be allowed in the magazine. The magazine shall have an effective lightning conductor. The following shall be hung in the lobby of magazine.

- (a) A copy of the relevant rules regarding safe storage both in English and in the language with which the workers concerned are familiar.
- (b) A statement of up-to-date stock in the magazine.
- (c) A certificate showing the last date of testing of the lightning conductor.
- (d) A notice that smoking is strictly prohibited.

19. In addition to these, the contractor shall also observe the following instructions and any further additional instructions which may be given by the Engineer-in-charge and shall be responsible for damage to property and any accident which may occur to workmen or the public on account of any operations connected with the storage handling or use of explosive and blasting. The Engineer-in-charge shall frequently check the contractor's compliance with these precautions.

20. All the materials, tools and equipment used for blasting operations shall be of approved type. The Engineer-in-charge may specify the type of explosive to be allowed in special cases. The fuse to be used in wet locations shall be sufficiently water-resistant as to be unaffected when

immersed in water for 30 minutes. The rate of burning of the fuse shall be uniform and definitely known to permit such a safe length being cut as will permit sufficient time to the firer to reach to place of safety before explosion takes place. Detonators shall be capable of giving effective blasting of the explosives. The blasting powder, explosive detonators, fuses, etc., shall be fresh and not damaged due to damp, moisture or, any other cause. They shall be inspected totally and removed immediately, if found unsuitable.

21 The blasting operation shall remain in charge of competent and experienced supervisory staff and workmen who are thoroughly acquainted with the details of handling explosives and blasting operations.

22 The Wasting shall be carried out during fixed hours of the day preferably during the mid-day luncheon hour or at the close of the work as ordered in writing by the Engineer-in-charge. The hours shall be made known to the people in the vicinity. All the charges shall be prepared by the man in charge only.

23 Red danger flags shall be displayed permanently in all directions during the blasting operations. People, except those who actually light the fuse, shall be prohibited from entering this area. The flags shall be planted 200 meters from the blasting site in all directions and all persons including workmen shall be excluded from the flagged area at least 10 minutes before the firing, a warning whistle being sounded for the purpose.

24 The charge holes shall be drilled in suitable places to required depths. Blasting should be as light as possible consistent with thorough breakage of the material necessary for economic loading and hauling. Any method of blasting which leads to over shooting shall be discontinued.

25 When blasting is done with powder, the fuse cut to the required length, shall be inserted into the hole and the powder dropped in. The powder shall be gently tamped with copper rods with rounded ends. The explosive powder shall then be covered with tamping materials which shall be tamped light but firmly.

26. When blasting is done with dynamite and other high explosives, dynamite, cartridges shall be prepared by inserting the square cut end of a fuse into the detonator and finishing it with nippers at the open end, the detonator gently pushed into the primer leaving 1/3rd of copper tube exposed outside. The paper of the cartridge shall then be closed up and securely bound with wire, or twine. The primer shall be housed into the explosive. Bore holes shall be of such size that the cartridge can easily go down. The holes shall be cleared of all debris and explosive inserted. The space of about 20 cm. above the charge shall then be gently filled with dry clay, passed home & the rest of the tamping formed of any convenient material gently packed with a wooden rammer.

27. At a time, not more than 10 such charges will be prepared and fired. The man in charge shall blow a whistle in a recognised manner or cautioning the people. All the people shall then be required to move to safe distance. The charge shall be lighted by the man in charge only. The man in charge shall count the number of explosions. He shall satisfy himself that all the charges have been exploded before allowing the workmen to go back to the work site.

28. In case of a misfire, the following procedure shall be observed :

(1) Sufficient time shall be allowed to account for the delayed blast. The man in charge shall inspect all the charges and determine the missed charges.

(2) If it is the blasting powder charge it shall be completely flooded with water. A new hole shall be drilled at about 45 cm. from the old hole and fired. This should be repeated till the old charge is blasted.

(3) In case of charges of gelatine, dynamite etc., the man in charge shall gently remove the tamping and the primer with the detonator. A fresh detonator and primer shall then be used to blast the charge.

Alternatively, the hole may be cleared of 30 cm. of tamping and the direction then ascertained by placing a stick in the hole. Another hole may then be drilled 15 cm. away and parallel to it. This hole shall then be charged and fired when the misfired hole should explode at the same time. The man in charge shall at once report to the contractor's Officer and Engineer-in-charge all cases of misfire, the cause of the same and what steps were taken in connection therewith.

29. If a misfire has been found to be due to defective detonator or dynamite, the whole quantity in the box from which defective article was taken must be sent to the authority directed by the Engineer-in-charge for inspection to ascertain whether all the remaining materials in the box are also defective.

30. A careful and day to day account of the explosive shall be maintained by the contractor in an approved manner in a register which shall be open to inspection by the Engineer-in-charge at all times.

31. Excavation shall be measured after removal of over burden by taking cross-sections at suitable intervals in the original position before the work starts and after its completion and computing the volumes in cubic metres by the method of average and areas. Where it is not feasible to compute volumes by this method because of erratic location of isolated deposits; the volumes shall be computed by other accepted methods. At the option of the Engineer-in-charge, the contractor shall leave depth indicators during excavations of such shape and size, and in such positions as directed so as to indicate the original ground level as accurately as possible. The contractor shall see that these remain intact till the final measurements are taken. Where cross-sectional measurements, could not be taken due to irregular configuration, or where the rock is admixed with other classes of materials, the volumes shall be computed on the basis of stacks of excavated rubble after making 40 per cent deduction therefrom.

Item 11- Diversion of water course, providing soffer dam, bund or island for foundations.

1. The item provides for the diversion of water course by suitable means such as by constructing ring bunds, coffer-dams, channeling, islanding or any other suitable means as may be necessary and approved by Engineer-in-charge. This item will not include dewatering of foundations, trenches, which will be covered in the item of open excavation. The contractor shall take all necessary protective measures against possible erosion due to tide variations if any and maintain the coffer dams, bund or island in proper manner during construction. He shall not be entitled for any payment or compensation in the event of washing of the coffer dam, bund or island at any time, either due to tidal waters if any or floods, or any other reasons whatsoever, and the contractor shall reconstruct the same. If required at his risk and cost. The size of the coffer dam, bund or island shall be such as would allow without obstruction and inconvenience, enough working free space all around the foundation works.

2. The contractor shall plan, construct and maintain satisfactorily necessary diversion channels and protective works so as to safely pass the stream flow and also satisfactorily meet with any sudden rise of flow due to tides, flood or any other reason, without damaging the foundation works. The cofferdam or bund shall be such as to give sufficient working space for construction, inspection and installations of pumping machinery inside the enclosed area. The coffer dam or bund shall be of adequate section and properly designed, constructed to prevent ingress of water as practically as possible in the foundation pits and to protect green concrete or masonry work.

3. Adequate pumping arrangement shall be made for dewatering the inside of coffer dam, bunds etc. Pumps of adequate capacity and in required number shall be provided to ensure adequate pumping.

4. The coffer dam, bund or island shall be completely removed and their materials shall be disposed of in the manner as directed by the Engineer-in-charge when no longer required.

5. The measurements for paying will be per number of pier or abutment for which diversion of water course etc. is required to be made. Unit of abutment will be inclusive of returns or wingwalls attached to it.

6. The unit cost includes all materials labour and equipment to complete the job. Diversion of channels etc. will have to be construed and maintained till all operations to complete the entire bridge structure are completed as may be necessary.

Item 12- Ordinary concrete with or without reinforcement

1. In case of ordinary concrete, mix is not required to be designed by preliminary tests and proportions of cement, fine aggregates and coars aggregates are specified by volume as given in table below for different grades of concrete designated as ordinary M. 100, M. 150, M.200 and M.250.

2. In the designation of a concrete mix, letter "M" refers to the mix and the number the specified 28 days works cube compressive strength of that mix on 150 mm. cubes expressed in kg./cm².

3. The ordinary concrete mix shall generally be specified by volume. For cement which normally comes in bags and is used by weight, volume shall be worked out taking 50 kg. of cement as 0.035 cubic metre in volume. While measuring aggregate by volume, shaking, ramming or hammering shall not be done. Proportioning of sand shall be as per its dry volume. In case it is dump, allowance for "bulking" shall be made as per IS : 2386 (Part-III).

4. Ingredients required for ordinary concrete containing one 50 Kg. bag of cement of different proportions of mix shall be as given in Table below.

TABLE

| Grade of Concrete | Mix By Volume | Total quantity of dry aggregates by volume Per 50 Kg. of cement, to be taken as sum of the individual volumes of fine and coarse aggregates max. | Proportion of fine aggregate to coarse aggregate | Quantity of water per 50 Kg. of cement max. |
|-------------------------------|---------------|--|--|---|
| 1 | 2 | 3 | 4 | 5 |
| (1 Cubic metre = 1000 Litres) | | | | |
| Ordinary | Litres | | | Litres. |
| M. 100 | 1:3:6 | 300 | General 1 :2 for fine aggregate to | 34 |
| M.150 | 1:2:4 | 220 | coarse aggregate by volume but subject | 32 |
| M.200 | 1:1 ½ :3 | 160 | to a upper limit of 1:1. 1/2 & a | 30 |
| M.250 | 1:1:2 | 100 | lower limit of 1 :3 | 27 |

NOTE - The proportions of the aggregates shall be adjusted from upper limit to lower limit progressively as the grading of the fine aggregates becomes finer & the maximum size of coarse aggregate becomes larger. Example - For an average grading of fine aggregate (that is Zone II of IS : 383-1963) the proportions shall be 1: 1 1/2, 1:2 and 1:3 for maximum size of aggregates 10 mm, 20 mm. and 40 mm. respectively (after carrying out sieve analysis).

Note-2 A mix leaner than M.100 (1:3:6) may be used for non- structural parts, if provided in the contract. In such case grading of aggregates shall be by volume. Other requirements for mixing, placing & curing shall be the same.

5. Following shall be the maximum nominal size of coarse aggregate for the different items of work:

| Sr. No. | Item of construction | Maximum nominal size of coarse aggregate |
|---------|--|--|
| (i) | R.C.C. well curb, R.C.C. well steining and R.C.C. Piles | 40 mm. |
| (ii) | R.C.C. well steining | 63mm. |
| (iii) | Well cap or pile cap; solid type piers, abutment and wing-walls, and their pier caps | 40 mm. |
| (iv) | R.C.C. works in cross girders deck slab, wearing | 20 mm. |

| | | |
|------|--|--|
| | coars, kerb, light post:, blast walls, approach slab etc. and hollow type piers, abutments, wing-walls and their pier caps, | |
| (v) | R.C.C bparings. | 20mm |
| (vi) | For any other item of construction not covered by items (i) to (v) | As specified on the drawing or as desired by the Engineer in-charge in case it is not specified on drawing. |

For heavily reinforced concrete members as in the case of ribs of main beams nominate maximum size of aggregate shall usually be restricted to 5 mm. less than the minimum lateral clear distance between the main bars or 5 mm. less than the minimum cover to the reinforcement, whichever is the smaller.

6. Fine aggregate shall be clean, hard, coarse sand, it shall be free from dust and such other substances. The sand be got approved by the Engineer-in-charge,

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

8. Cement shall be stored above the ground level in perfectly dry and water tight sheds. Wherever bulk storage containers are used, their capacity should be sufficient to cater to thy 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 intermixing the material.

9. The water for mixing shall be potable water to satisfaction of the Engineer-in-charge. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the job.

10. For all work concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained throughout the construction. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate show complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than 2 minutes after all ingredients have been put into the mixer.

11. When hand mixing is permitted by the Engineer in-charge for small jobs or for certain other reasons. It shall be done en a smooth watertight platform large enough to allow efficient turning over of the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material shall get mixed with concrete nor does the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate and cement shall then be mixed thoroughly by turning over to get a mixture of uniform colour. Enough water shall then be added gradually through a rose can and the mass turned over till a mix of required consistency is obtained. In hand mixing quantity of cement shall be increased by 10 per cent above that specified.

12. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Unless otherwise agreed to be the Engineer-in-charge, the first batch of concrete from the mixer shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoughtly cleaned before changing from one type of cement to another.

13. The method of transporting and placing concrete shall be approved by the Engineering-in-charge. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent material takes places. All form work and reinforcement contained in it shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete. No concrete shall be placed in any part of the structure until the approval of the Engineer-in-charge has been obtained.

14. If concreting is not started within 24 hours of the approval being given, it shall have to be obtained again from the Engineer-in-charge. Concreting being given it shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer unless carried in properly design agitators, operating continuously, when this time shall be within 2 hours of the addition of cement to the mix and within 30 minutes of its discharge from the agitator. Except where otherwise agreed to be the Engineer-in-charge, concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrators are used and not exceeding 0.30 metre in all other cases.

15. Unless otherwise agreed to by the Engineer-in-charge concrete shall not be dropped into place from a height exceeding 2 metres. When trunking or chutes are used they shall be kept clean and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept, clean, thoroughly wetted and covered with a 13mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. This 13 mm. layer of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. The first layer of concrete to be placed on this surface shall not exceed 150 mm. in thickness, and shall be well rammed against old work particular attention being given to corners and close spots.

16. All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless otherwise permitted by the Engineer-in-charge for exceptional cases, such as concreting under water, where vibrators can not be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of break downs.

17. Immediately after compaction, concrete shall be protected against harmful effects of weather, including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and driving out process. It shall be covered with wet sacking, hessian or other similar absorbent material approved by the Engineer-in-charge soon after the initial set, and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonry work over the foundation may be started after 48 hours of its laying but the curing of concrete shall be continue for a period of 14 days.

18. Form work shall include all temporary or permanent forms required for forming the concrete, together with all temporary construction required for their support. Form work shall however be divided into following two distinct categories :-

(1) Shuttering i.e., form work required for forming the concrete.

(2) Scaffolding i.e., form-work required for supporting shuttering.

Forms for shuttering shall be constructed only in metal suitably lined. Forms for scaffolding shall be constructed of metal or timber. Both shuttering and scaffolding shall be of substantial -rigid construction and shuttering shall be true to shape and dimensions shown on the drawings. All bolts and rivets shall be counter-sunk and well ground to provide a smooth, plane surface.

19. Forms shall be mortar-tight and shall be made sufficiently rigid by the use of ties and bracings to prevent any displacement or sagging between supports. They shall be strong enough to withstand all pressure, ramming and vibration, without deflection from the prescribe lines occurring during and after placing the concrete. Screw jacks or hard wood wedges where required shall be provided to make up any settlement in the formwork either before or during the placing of concrete. Suitable camber shall be provided in horizontal members of structure, specially in long spans to counteract the effects of any fixed as to provide for such camber. Forms shall be so constructed as to be removable in sections in the desired sequence, without damaging the surface of concrete or disturbing other sections. Unless otherwise specified or directed, chambers or fillets of sizes 25 mm x 25 mm shall be provided at all angles of formwork to avoid sharp corners.

20- The inside surfaces of shuttering shall, except in the case of permanent form work or where otherwise agreed to by the Engineer-in-charge, be coated with an approved material to prevent adhesion of concrete to the form work. Release agents shall be applied strictly in accordance with the manufacturer's instructions and shall not be allowed to come into contact with any reinforcement or prestressing tendons and anchorages. Different release agents shall not be used in form work for concrete which will be visible in the finished works.

21. Special measures shall be taken to ensure that the form work does not hinder the shrinkage of concrete because without these cracking could occur before the form work is removed. Wherever applicable arrangements must be made to ensure that the form work does not restrain the shortening and hogging of the beams or slabs during tensioning of the tendons. The form work should take due account of the calculated amount of positive or negative camber so as to ensure the correct final shape of the structures having regard to the deformation of a false work, scaffolding or propping and the instantaneous or deferred deformation due to various causes affecting prestressed structures. Where there are re-entrant angles in the concrete sections the form work should be removed at those sections as soon as possible after the concrete has set in order to avoid cracking due to shrinkage of concrete, formwork shall be tight enough to prevent any appreciable loss of cement during vibrations, suitable utterances should be provided in the formwork. Immediately before concreting all forms shall be thoroughly cleaned. Contractor shall give the Engineer-in-charge due notice before palcing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength alignment and general fitness, but such inspection shall not relieve the contractor of his responsibility safety of men, machinery, materials and for results obtained.

22. The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike any formwork. While fixing the time for removal of formwork, due consideration shall be given to local conditions, character of the structure, the weather and other conditions that influence the setting of concrete and of the materials used in the mix. Where field operations are controlled by strength tests of concrete, the removal of the load-supporting or soffit forms may commence when concrete has attained strength equal to atleast twice the stress to which the concrete will be subjected at the time of striking props including the effect of any further addition of loads. When field operations are not controlled by strenght tests of concrete the vertical forms of beams, columns and walls may be removed after 2 days. The props of slabs and beams may be removed after 21 days respectively. All formwork shall be removed without causing any damage to the concrete. Centering shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted, they or their removable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embeded metal part shall have less than 25 mm. cover to the finished concrete surface. Where it is intended to refuse the formwork, it shall be cleaned and made good to the satisfaction of the Engineer-in-charge.

23. Immediately after the removal of forms, all exposed bars or bolts passing through the Cement concrete member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of atleast 25 mm. below the surface of the concrete and the resulting holes be filled by cement mortar. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions, honecomb spots, broken edges or corners and other defects, shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and of as dry as consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids. Surfaces which have been pointed shall be kept moist for a period of twenty four hours. If rock pockets/honeycombs, in the opinion of the Engineer-in-charge are of such an extent or character as to affect the strenght of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

24. In the case of reinforced concrete work workability shall be such that the concrete surrounds and properly grips all reinforcement. The degree of consistency, which shall depend upon the nature of work and methods of vibration of concrete shall be determined by regular slump tests. Following slump shall be adopted for different types of works.

| Type | | Slump (mm) (at the Time of Placing of Concrete) |
|------|---|---|
| 1) | a) Structure with exposed inclined surface requiring low slump concrete to allow proper compaction | 25 |
| | b) Plain cement concrete | 25 |
| 2) | RCC structure with widely spaced reinforcements; e.g. solid columns, piers, abutments, footings, well steining | 40 – 50 |
| 3) | RCC structure with fair degree of congestion of reinforcement; e.g. pier and abutment caps, box culverts, well curb, well cap, walls with thickness greater than 300 mm | 50 – 75 |
| 4) | RCC and PSC structure with highly congested reinforcements e.g. deck slab girders, box girders, walls with thickness less than 300 mm | 75 – 125 |
| 5) | Underwater concreting through tremie e.g. bottom plug, cast in-situ piling | 150 – 200 |

25. Works strength tests shall be made in accordance with IS : 516. Each test shall be conducted on ten specimens/five of which shall be tested at seven days and the remaining five at 28 days. The samples of concrete shall be taken on each day of concreting and cubes shall be made at the rate of one for every 5 cubic metre of concrete or a part thereof. However, if concreting done in a day is less than 15 cubic meters, the minimum number of cubes can be reduced to 6 with the specific permission of the Engineer-in-charge. Similar works tests shall be carried out whenever the quality and grading of materials is changed irrespective of the quantity of concrete poured. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveal a poor quality of concrete and in other special cases.

26. The average strength of the group of cubes cast for each day shall not be less than the specified works cube-strength. 20 per cent of the cubes cast for each day may have values less than the specified strength, provided the lowest value is not less than 85 per cent of the specified strength.

27. R.C.C. work shall have exposed concrete surface. Centering design and its erection shall be approved by the Engineer-in-charge. One carpenter with helper will invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited over reinforcement laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, molar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapchi or metal pieces shall not be used for this purpose. Concreting of important structural members shall always be done in the presence and under the supervision of departmental person not below the rank of Asst. Engineer/ Addl. Asst. Engineer/ Overseer or as instructed by the Engineer-in-charge. After removal of form work checks that concrete produced is of good quality. Plastering shall not be allowed to the exposed faces of concrete.

28. In reinforced concrete the volume occupied by reinforcement shall not be deducted. The slab shall be measured as running continuously through and the beam as the portion below the slab.

29. All necessary labour, materials, equipment, etc., for sampling, preparing test cubes, curing etc., shall be provided by the Contractor. Testing of the materials and concrete may be arranged by the Engineer-in-charge in an approved laboratory at the cost of the contractor.

30. The payment will be made on cmt. basis of the finished work.

31. The unit rate for concrete shall include the cost of all materials, labour, tools and plan required for mixing, placing in position, vibrating and compacting finishing as per directions of the Engineer-in-charge, curing and all other incidental expenses for producing concrete of specified strength to complete the structure or its components as shown on the drawings and according to these specifications. The rate shall also include the cost of making/fixing and removing of all centres and forms required for the work.

item 13 - Controlled concrete

1. For controlled concrete, design of the mix shall be approved after preliminary tests and all necessary precautions shall be taken in its production to ensure that the required works cube strength is attained and maintained. The controlled concrete shall be eight grades designated as M. 100, M. 150, M. 200, M. 250, M. 300, M. 350, M. 400 and M. 450 with the suffix 'controlled' added to it.

2. In the designation of a concrete mix, letter 'M' refers to the mix and the number to the specified 28 days works cube compressive strength of that mix on 150 mm cubes, expressed in kg/cm² where ordinary Portland cement conforming to IS : 269 or Portland blast furnace cement conforming to IS : 455 is used, the compressive strength requirements for various grades of concrete shall be as given below on The next page :-

20. The inside surfaces of shuttering shall, except in the case of permanent form work or where otherwise agreed to by the Engineer-in-charge, be coated with an approved material to prevent adhesion of concrete to the form work. Release agents shall be applied strictly in accordance with the manufacturer's instructions and shall not be allowed to come into contact with any reinforcement or prestressing tendons and anchorages. Different release agents shall not be used in form work for concrete which will be visible in the finished works.

21. Special measures shall be taken to ensure that the form work does not hinder the shrinkage of concrete because without these cracking could occur before the form work is removed. Wherever applicable arrangements must be made to ensure that the form work does not restrain the shortening and hogging of the beams or slabs during tensioning of the tendons. The form work should take due account of the calculated amount of positive or negative camber so as to ensure the correct final shape of the structures having regard to the deformation of a false work, scaffolding or propping and the instantaneous or deferred deformation due to various causes affecting prestressed structures. Where there are re-entrant angles in the concrete sections the form work should be removed at those sections as soon as possible after the concrete has set in order to avoid cracking due to shrinkage of concrete, formwork shall be tight enough to prevent any appreciable loss of cement during vibrations, suitable utterances should be provided in the formwork. Immediately before concreting all forms shall be thoroughly cleaned. Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength alignment and general fitness, but such inspection shall not relieve the contractor of his responsibility safety of men, machinery, materials and for results obtained.

22. The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike any formwork. While fixing the time for removal of formwork, due consideration shall be given to local conditions, character of the structure, the weather and other conditions that influence the setting of concrete and of the materials used in the mix. Where field operations are controlled by strength tests of concrete, the removal of the load-supporting or soffit forms may commence when concrete has attained strength equal to at least twice the stress to which the concrete will be subjected at the time of striking props including the effect of any further addition of loads. When field operations are not controlled by strength tests of concrete the vertical forms of beams, columns and walls may be removed after 2 days. The props of slabs and beams may be removed after 21 days respectively. All formwork shall be removed without causing any damage to the concrete. Centering shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted, they or their removable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm. cover to the finished concrete surface. Where it is intended to reuse the formwork, it shall be cleaned and made good to the satisfaction of the Engineer-in-charge.

23. Immediately after the removal of forms, all exposed bars or bolts passing through the Cement concrete member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of at least 25 mm. below the surface of the concrete and the resulting holes be filled by cement mortar. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions, honeycomb spots, broken edges or corners and other defects, shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and of as dry as consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids. Surfaces which have been pointed shall be kept moist for a period of twenty four hours. If rock pockets/honeycombs, in the opinion of the Engineer-in-charge are of such an extent or character as to affect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

24. In the case of reinforced concrete work workability shall be such that the concrete surrounds and properly grips all reinforcement. The degree of consistency, which shall depend upon the nature of work and methods of vibration of concrete shall be determined by regular slump tests. Following slump shall be adopted for different types of works.

| Type | | Slump (mm) (at the Time of Placing of Concrete) |
|------|---|---|
| 1) | a) Structure with exposed inclined surface requiring low slump concrete to allow proper compaction | 25 |
| | b) Plain cement concrete | 25 |
| 2) | RCC structure with widely spaced reinforcements; e.g. solid columns, piers, abutments, footings, well steining | 40 – 50 |
| 3) | RCC structure with fair degree of congestion of reinforcement; e.g. pier and abutment caps, box culverts, well curb, well cap, walls with thickness greater than 300 mm | 50 – 75 |
| 4) | RCC and PSC structure with highly congested reinforcements e.g. deck slab girders, box girders, walls with thickness less than 300 mm | 75 – 125 |
| 5) | Underwater concreting through tremie e.g. bottom plug, cast in-situ piling | 150 – 200 |

25. Works strength tests shall be made in accordance with IS : 516. Each test shall be conducted on ten specimens/five of which shall be tested at seven days and the remaining five at 28 days. The samples of concrete shall be taken on each day of concreting and cubes shall be made at the rate of one for every 5 cubic metre of concrete or a part thereof. However, if concreting done in a day is less than 15 cubic meters, the minimum number of cubes can be reduced to 6 with the specific permission of the Engineer-in-charge. Similar works tests shall be carried out whenever the quality and grading of materials is changed irrespective of the quantity of concrete pour. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveal a poor quality of concrete and in other special cases.

26. The average strength of the group of cubes cast for each day shall not be less than the specified works cube-strength. 20 per cent of the cubes cast for each day may have values less than the specified strength, provided the lowest value is not less than 85 per cent of the specified strength.

27. R.C.C. work shall have exposed concrete surface. Centering design and its erection shall be approved by the Engineer-in-charge. One carpenter with helper will invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited over reinforcement laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapchi or metal pieces shall not be used for this purpose. Concreting of important structural members shall always be done in the presence and under the supervision of departmental person not below the rank of Asst. Engineer/ Addl-Asst. Engineer Overseer or as instructed by the Engineer-in-charge. After removal of form work checks that concrete produced is of good quality. Plastering shall not be allowed to the exposed faces of concrete.

28. In reinforced concrete the volume occupied by reinforcement shall not be deducted. The slab shall be measured as running continuously through and the beam as the portion below the slab.

29. All necessary labour, materials, equipment, etc., for sampling, preparing test cubes, curing etc., shall be provided by the Contractor. Testing of the materials and concrete may be arranged by the Engineer-in-charge in an approved laboratory at the cost of the contractor.

30. The payment will be made on cmt. basis of the finished work.

31. The unit rate for concrete shall include the cost of all materials, labour, tools and plan required for mixing, placing in position, vibrating and compacting finishing as per directions of the Engineer-in-charge, curing and all other incidental expenses for producing concrete of specified strength to complete the structure or its components as shown on the drawings and according to these specifications. The rate shall also include the cost of making/fixing and removing of all centres and forms required for the work.

Item 13 - Controlled concrete

1. For controlled concrete, design of the mix shall be approved after preliminary tests and all necessary precautions shall be taken in its production to ensure that the required works cube strength is attained and maintained. The controlled concrete shall be eight grades designated as M. 100, M. 150, M. 200, M. 250, M.300, M. 350, M. 400 and M. 450 with the suffix 'controlled' added to it.

2. In the designation of a concrete mix, letter 'M' refers to the mix and the number to the specified 28 days works cube compressive strength of that mix on 150 mm cubes, expressed in kg/cm² where ordinary Portland cement conforming to IS : 269 or Portland blast furnace cement conforming to IS : 455 is used, the compressive strength requirements for various grades of concrete shall be as given below on the next page :-

| Grade of Concrete | Compressive works test strength in kg/cm ² on 150 mm. cubes, conducted in accordance with IS '516 | |
|-------------------|--|-----------------|
| | Min. at 7 days | Win. at 28 days |
| M 100 | 70 | 100 |
| M 150 | 100 | 150 |
| M 200 | 135 | 200 |
| M 250 | 170 | 250 |
| M 300 | 200 | 300 |
| M 350 | 235 | 350 |
| M 400 | 270 | 400 |
| M 450 | 300 | 450 |

NOTE - In all cases, the 28 days compressive strength specified in the above Table shall alone be the criterion for acceptance or rejection of the concrete.

Where the strength of a concrete mix, as indicated by tests, lies in between the strength for any two grades specified in the above Table such concrete shall be classified for all purposes as a concrete belonging to the lower or the two grades between which its strength lies.

3. Concrete mix shall be designed on the basis of preliminary tests so as attain a strength at least 33 per cent higher than that required on work tests. The proportions for ingredients chosen shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with the means available. Except where it can be shown to the satisfaction of the Engineer-in-charge that supply of properly graded aggregate of uniform quality can be maintained till the completion of work, grading of aggregate should be controlled by obtaining the coarse aggregates in different sizes and blending them in the right proportions as required. Aggregates of different sizes shall be stocked in separate stock piles. Required quantity of material shall be stock piled several hours, preferably a day, before use. Grading of coarse and fine aggregate shall be checked as frequently as possible, frequency for a given Job being determined by the Engineer-in-charge to ensure that the suppliers are maintaining the uniform grading as approved for samples used in the preliminary tests.

4. In proportioning concrete, the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the maker's weight per bag, a reasonable number of bags shall be weighed separately to check the net weight. Where cement is weighed from bulk stocks at site and not by bags, it shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipment shall be maintained in a clean, and serviceable condition. Their accuracy shall be periodically checked.

5. It is most important to keep the specified water-cement ratio constant and at its correct value. To this end, moisture content in both fine and coarse aggregates shall be determined by the Engineer-in-charge according to the weather conditions. The amount of mixing water shall then be adjusted to compensate for variations in the moisture cement. For the determination of moisture content in the aggregates, IS : 2386 (Part -II) shall be referred to. Suitable adjustments shall also be made in the weights of aggregates to allow for the variation in weights of aggregates due to variation in their moisture content. Minimum quantity of cement to be used in controlled concrete shall not be less than 210 Kg. per cubic metre in plain concrete and not less than 300 kg/per cubic metre in reinforced concrete structural members. The minimum quantity of cement for prestressed concrete work shall not less than 360 kg/per cubic metre of concrete nor shall it be more than 540 kg/per cubic metre of concrete.

6. Following shall be the maximum nominal size of coarse aggregate for the different items of work :

| Sr. No. | Item of construction | Maximum nominal size of Coarse aggregate |
|---------|---|---|
| (i) | R.C.C. well curb, R.C.C. well steining and R.C.C. piles. | 40mm. |
| (ii) | P.C.C. well steining | 63mm. |
| (iii) | Well cap or pile cap; solid type piers, abutments and wing-walls, their pier caps. | 40mm. |
| (iv) | R.C.C. works in cross girders, deck slab, wearing coarse, kerb, light posts, blast walls approach slab etc.; and, hollow type piers, abutments, wing-walls and their pier caps. | 20 mm. |
| (v) | R.G.C. bearings | 20mm. |
| (vi) | For any other item of construction not covered by items (i) to (v) above | As specified on the drawing or as desired by the Engineer-in-charge in case it is not specified on drawing. |

For heavily reinforced concrete members as in the case of ribs of main beams, nominal maximum size of aggregate shall usually be restricted to 5 mm. less than the minimum lateral clear distance between the main bars or 5 mm. less than the minimum cover to the reinforcement whichever is the smaller.

7. Fine aggregate shall be clean, hard, coarse sand. It shall be free dust and such other substances. The sand be get approved by the Engineer-in-charge.

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

9. Cement shall be stored above the ground level in perfectly dry and watertight sheds. Wherever bulk storage containers are used, their capacity should be sufficient to cater to the requirements at site and should be cleaned atleast once every 3 to 4 month s. The aggregates shall be stored in such a way as to prevent admixture of foreign materials. Different sizes of fine or coarse aggregate shall be stored in separate stock piles sufficintly away from such other to prevent intermixing the materials.

10. The water for mixing shall be potable water to satisfaction of the Engineer-in-charge. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the job.

11. For all work concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained throughout the construction. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each indial particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than 2 minutes after all ingredients have been put into the mixer.

12. Mixer which have been out of use more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Unless otherwise agreed to be the Engineer-in-charge, the first batch of concrete from the mixer shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement to another.

13. The method of transporting and placing concrete shall be approved by the Engineer-in-charge. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent material takes place. All form work and reinforcement contained in it shall be cleaned and made free from standing water, dust, snow or be immediately before placing of concrete. No concrete shall be palced in any patt of the structure until the approval of the Engineer-in-charge has been obtained.

14. If concreting is not started within 24 hours of the approval being given. It shall have to be obtained again from the Engineer-in-charge. Concreting then shall proceed continuously over the area between construction joints. Fresh concrete shall riot be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer-unless carried in properly design agitators, operating continuously when this time shall be within 3 hours of the addition of cement to the mix an within 30 minutes of its discharge from the agitator. Except where otherwise agreed to be the Engineer-in-charge. Concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrator are used not exceeding 0.30 metre in all other cases.

15. Unless otherwise agreed to be the Engineer-in-charge concrete shall not be dropped i-to place from a height exceeding 2 metres. When trunking or chutes are used they shall be kept clean and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. This 13 mm. layer of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. The first layers of concrete to be placed on this surface shall not exceed 150 mm. in thickness and shall be well rammed against old particular attention being given to corners and close sports.

16. All concrete shall be compacted to produce a dense homogeneous mass with the assistance of Vibrators, unless otherwise permitted by the Engineer-in-charge for exceptional cases, such as concreting under water, where vibrators can not be used. Sufficient vibrator in serviceable condition shall be kept at site so that spare equipment is always available in the event of break downs.

17. Immediately after compaction, concrete shall be protected against harmful effects of weather including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and drying out process. It shall be covered with wet sacking, hessian or other simila. absorbant material approved by the Engineer-in- charge soon after the initial set, and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonry work over the foundation concrete may be started after 48 hours of its laying but the curing of concrete shall be continued for a minimum period of 14 days.

18. Form work shall include all temporary or permanent forms required for forming the concrete, together with all temporary construction required for their support. Formwork shall however be divided into following two distinct categories :-

(1) Shuttering i.e. formwork required for forming the concrete.

(2) Scaffolding i.e. formwork required for supporting shuttering.

Forms for shuttering shall be constructed only, in metal suitably lined. Forms for scaffolding shall be constructed of metal or timber. Both shuttering and scaffolding shall be substantial rigid construction and shuttering shall be true to shape and dimensions shown on the drawings. All bolts and rivets shall be counter-sunk and well ground to provide a smooth, plane surface.

19. Forms shall be mortar-tight and shall be made sufficiently rigid by the use of ties and bracings to prevent any displacement or sagging between supports. They shall be strong enough to withstand all pressure, ramming and vibration, without deflection from the prescribed lines occurring during and after placing the concrete. Screw jacks or hardwood wedges where required shall be provided to make up any settlement in the formwork either before or during the placing of concrete. Suitable camber shall be provided in horizontal members of structure specially in long spans to counteract the effects of any deflection. The formwork shall be so fixed as to provide for such camber. Forms shall be so constructed as to be removable in sections in the desired sequence. Without damaging the surface of concrete or disturbing other sections. Unless otherwise specified or directed, chamfers or fillets of sizes 25 mm x 25 mm shall be provided at all angles of formwork to avoid sharp corners.

20. The inside surface of shuttering shall, except in the case of permanent form work or where otherwise agreed to be the Engineer-in-charge, be coated with an approved material to prevent adhesion of concrete to the form work. Release agents shall be applied strictly in accordance with the manufacturer's instructions and shall not be allowed to come into contact with any reinforcement or prestressing tendons and anchorages. Different release agent shall not be used in form work for concrete which will be visible in the finished works.

21. Special measures shall be taken to ensure that the form does not hinder the shrinkage of concrete because without these cracking could occur before the form work is removed. Wherever applicable arrangements must be made to ensure that the form work does not restrain the shortening and hogging of the beams or slabs during tensioning of the tendons. The formwork should take due account of the calculated amount of positive or negative camber so as to ensure the correct final shape of the structure having regard to the deformation due of false work, scaffolding or propping and the instantaneous or deferred deformation due to various causes affecting prestressed structures. Where they are re-entrant angles in the concrete sections the form work should be removed at these sections as soon as possible after the concrete has set in order to avoid cracking due to shrinkage of concrete. Form work shall be tight enough to prevent any appreciable loss of cement during vibrations. Suitable tolerance should be provided in the formwork. Immediately before concreting all forms shall be thoroughly cleaned. Contractor shall give the engineer-in-charge due notice before placing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength, alignment and general fitness, but such inspection shall not relieve the contractor of his responsibility for safety of men, machinery, materials and for results obtained.

22. The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike any formwork. While fixing the time for removal of formwork, due consideration shall be given to local conditions that influence the setting of concrete and of concrete and of the materials used in the mix. Where field operations are controlled by strength tests of concrete the removal of the load supporting of soffit forms may commence when concrete has attained strengthening props including the effect or any further addition of loads. When field operations are not controlled by strength tests of concrete the vertical forms of beams, columns and walls may be removed after 2 days. The props of slabs and beams may be removed after 14 and 21 days respectively. All formwork shall be removed without causing any damage to the concrete. Centering shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted, they or their removable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar.

No permanently embedded metal part shall have less than 25 mm. cover to the finished concrete surface. Where it is intended to be cleaned and made good to the satisfaction of the Engineer-in-charge.

23. Immediately after the removal of forms, all exposed bars or bolts passing through the Cement Concrete member to a depth of at least 25 mm. below the surface of the concrete and the resulting holes be filled by cement mortar. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions, honeycomb spots, broken edges or corners and other defects, shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregated mixed in the proportions used in the grade of concrete that is being finished and of as dry a consistency as is possible to use.

Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids.

Surfaces which have been pointed shall be kept moist for a period of twenty four hours. If rock pockets/honey-combs, in the opinion of the Engineer-in-charge are of such an extent or character as to effect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

24. In the case of reinforced concrete work, workability shall be such that the concrete surrounds and properly grips all reinforcement. The degree of consistency, which shall depend upon the nature of work and methods of vibration of concrete shall be determined regular slump tests.

| Type | | Slump (mm) (at the Time of Placing of Concrete) |
|------|---|---|
| 1) | a) Structure with exposed inclined surface requiring low slump concrete to allow proper compaction | 25 |
| | b) Plain cement concrete | 25 |
| 2) | RCC structure with widely spaced reinforcements; e.g. solid columns, piers, abutments, footings, well steining | 40 – 50 |
| 3) | RCC structure with fair degree of congestion of reinforcement; e.g. pier and abutment caps, box culverts, well curb, well cap, walls with thickness greater than 300 mm | 50 – 75 |
| 4) | RCC and PSC structure with highly congested reinforcements e.g. deck slab girders, box girders, walls with thickness less than 300 mm | 75 – 125 |
| 5) | Underwater concreting through tremie e.g. bottom plug, cast in-situ piling | 150 – 200 |

25. For controlled concrete preliminary tests shall consist of three sets of separate tests, and in each set tests shall be conducted on six specimens. Not more than one set of six specimens shall be made on any particular day. Of the six specimens in each set, three shall be tested at seven days and the remaining three at 28 days. The preliminary tests at 27 days are intended only to indicate the strength likely to be attained at 28 days. Work strength tests shall be made in accordance with IS : 516. EACH test shall be conducted on ten specimens five of which shall be tested at seven days and the remaining five at 28 days. The samples of concrete shall be taken on each day of concreting and cubes shall be made at the rate of one for every 5 cubic metre of concrete or a part thereof. However, if concreting done in a day is less than 15 cubic metre, the minimum number of cubes can be reduced to 6 with the specific permission of the Engineer-in-charge. Similar works tests shall be carried out whenever the quality and grading of materials is changed irrespective of the quantity of concrete poured. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure to tests given above reveals a poor quality of concrete and in other special cases.

26. The average strength of the group of cubes cast for each day shall not be less than the specified works cube strength 20 per cent of the cubes cast each day may have values less than the specified strength, provided the lowest value is not less than 85 per cent of the specified strength.

27. R.C.C. work shall have exposed concrete surface. Centering design and its erection shall be approved by the Engineer-in-charge. One carpenter with helper will invariably be kept throughout the period of concreting. Movement of labour and other persons shall be totally prohibited over reinforcement laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose. Concreting of important structural members shall always be done in the presence and under the supervision of departmental person not below the rank of Asst. Engineer/Addl. Asst. Engineer/Overseer or as instructed by the Engineer-in-charge. After removal of form work and shuttering, the executive Engineer shall inspect the work and satisfy by random checks that concrete produced is of good quality. Plastering shall not be allowed to the exposed faces of concrete.

28. In reinforced concrete the volume occupied by reinforcement shall not be deducted. The slab shall be measured as running continuously through and the beam as the portion below the slab.

29. All necessary labour, materials, equipment, etc., for sampling, preparing test cubes, curing etc., shall be provided by the Contractor. Testing of the materials and concrete may be arranged by the Engineer-in-charge in an approved laboratory at the cost of the contractor.

30. The payment will be made on cmt. basis of the finished work.

31. The unit rate for concrete shall include the cost of all materials, labour, tools and plant required for mixing, placing in position, vibrating and compacting finishing as per directions of the Engineer-in-charge, curing and all other incidental expenses for producing concrete of specified strength to complete the structure or its components as shown on the drawings and according to these specifications. The rate shall also include the cost of making fixing and removing of all centres and forms required for the work.

Item 14 A. Providing steel cutting edge including launching where necessary.

1. Finished rolled material shall be free from cracks, flaws, injurious seams, laps, blisters, regged and imperfect edges and other defects. It shall have a smooth, uniform finish, and shall be straight. It shall also be free from loose mill scale, rust, pits or other defects affecting its strength and durability. The acceptance of any material on inspection at the mill, i.e. rolling mills, foundry or fabricating plant where material for the work is manufactured, shall not be a bar to its subsequent rejection, if found defective. Mild steel for bolts and nuts shall conform to IS : 226 but have a minimum tensile strength of 44 kg/mm² and minimum percentage elongation of 14.

2. All work shall be in accordance with the drawings. Care shall be taken that all parts of an assembly fit accurately together. All structural steel members and parts shall have straight edge and blunt surfaces. If necessary, they shall be straightened or flattened by pressure unless they are required to be of curvilinear forms. They shall also be free from twist. Pressure applied for

straightening or flattening shall be such as would not injure the materials. Adjacent surfaces or edges shall be in close contact or at uniform distance throughout. All structural steel parts, where required, shall be sheared, chopped, sawn or flame cut and ground accurately to the required dimensions and shape. All edges of splice and gusset plates 12 mm. thick and over shall be machined and those less than 12 mm. thick may be sheared and ground.

3. The diameter of rivets shown on drawings shall be the size before heating. Each rivet shall be of sufficient length to form a head of the standard dimensions as given in I.S. Handbook on Steel Sections, Part-I. It shall be free from burrs on the underside of the head. All loose or burnt rivets and rivets with cracked or badly formed defective heads or with heads which are unduly eccentric with the shanks, shall be removed and replaced. In removing rivets, the head shall be sheared off and the rivet punched out so as not to injure the adjacent metal and if necessary, they shall be drilled out. Recupping and caulking shall not be permitted.

4. All welding shall be done with the prior approval of the Engineer-in-charge and the workmanship shall conform to the specifications of IS : 823. When material thickness is 20 mm. or more, special precautions like preheating shall be taken as laid down in IS : 823.

5. The cutting edge shall be fabricated to the exact shape and dimensions shown on the detailed drawings. The steel sections shall be bent cold to the required shape by making V-cuts in the horizontal portion at not less than eight places for single well at uniform intervals along length. The V-cuts shall then be welded together electrically. Steel cutting edges shall be transported on site and shall be conveyed to the exact location by any means including launching by barges if necessary and shall be placed in true position as directed by Engineer-in-charge.

6. The measurements of this item shall be in tonnes based on the net weight of metal in the fabricated structure computed on the basis of nominal weight of materials. No payment shall be made for rivets, bolts, nuts, washer and for welding. No deduction shall be made for the hole punched or V-cuts made in the structure.

7. The unit rate shall include the cost of all materials labour, tools and plants including setting out on site to complete the work.

Item-14-B-Providing steel liner for curbs for wells/caissons and steel steining for caissons.

1. Para 1 to 4 of the item of cutting edge shall apply.

2. The steel liner for curbs and steel steining shall be fabricated to the exact shape and dimensions shown on the detailed drawings. The steel sections shall be bent cold to the required shape by making V-cuts in the horizontal portion at not less than eight places for single well and at uniform intervals along length. The V-cuts shall then be welded together electrically.

3. Para 6 and 7 of item of steel cutting edge shall apply.

Item-15 Providing and casting-in-situ well curb

1. The dimension and shape of the curb shall be strictly in conformity to drawings. The well curb shall be placed truly in position and level. All concreting in the well curb shall be done in one continuous operation.

3. Para 1 to 31 of item of controlled concrete shall apply.

Item-16 Providing and casting-in situ concrete for well steining.

1. The dimensions and shape of the well shall strictly conform to those shown on the drawings. The steining of the well shall be built in one straight line from bottom to top, the work being checked carefully with the aid of straight edges of lengths approved by the Engineer-in-charge. Plumb bob or spirit level shall not be used. Steining built in the first stage shall not be more than 2 metres and in subsequent stages it shall not exceed the diameter of the well or the depth of well sunk below the adjoining bed level at a time. As far as possible, the stages of work shall not be kept at the location of joints in the vertical steining bars. The height of steining shall be calibrated by making at least 4 gauges distributed equally on the outer periphery of the well each in the form of a 10 cm. wide strip painted on the well. Each in the form of a 10 cm. wide strip painted on the well, with every metre mark shown in black paint. The gauges shall start with zero at the bottom or cutting edge. Marking of the gauges shall be done carefully with a steel tape. After sinking of a stage in complete all damaged portions of steining: 3 at top of the previous stage shall be properly repaired before constructing the next stage. When dowel bars for foundations are to be provided, 100 mm. holes shall be kept in steining itself at regular intervals as shown in drawings or as directed by the Engineer-in-charge.

2. Para 1 to 31 of item of ordinary concrete shall apply.

Item-17-A Sinking of wells/caissons in all strata of soil and Murrum.

1. This item includes sinking of wells for foundations through sand, gravel, loose boulders, silt, clay, soft and hard murrum and all such other similar strata except through rock to the required level as may be directed by the engineer-in-charge including removal of excavated stuff, isolated boulders, any tree, logs or any other similar objects and adopting for this purpose, suitable methods such as open dredging, or mechanical grabbing by using winches, including use of drop chiselling, employing of divers including pneumatic drilling for breaking and removing loose isolated boulders and all such other methods of well sinking except resorting to pneumatic sinking.

2. The well shall as far as possible be sunk true and vertical through all types of soils. The well shall be sunk by excavating material uniformly from inside the dredge hole. Sinking or loading of the well with kentledge shall be commenced only after the steining has been cured for at least 48 hours or as specified in the approved drawings. Kentledge shall be placed in an orderly and safe manner and in such a way that it does not interfere with the excavation or the material from the dredge hole and also does not in any way damage the steining of the well. Normally dewatering of well shall not be permitted as a means for sinking the well. It also shall never be resorted to if there is any danger of sand-blowing under the well. Water jetting may be employed for well sinking wherever necessary.

3. Explosives shall not be generally used as an aid for well sinking. However in cases where explosives are to be used, prior approval of the Engineer-in-charge shall be obtained. Blasting of any sort shall only be done in the presence of Engineer-in-charge and not before the concrete in the steining has hardened sufficiently and is more than 7 days old. Mild explosive charges may be used for setting the well only with the prior permission of the Engineer-in-charge. If blasting has been used for setting the well after it has reached the design foundation level, normally 24 hours shall be allowed to lapse before the bottom plug is laid. The charges shall be exploded well below the cutting edge by making a sump so as to avoid chances of any damage to the curb or to the steining of the well. All prevalent laws concerning handling, storing and using of explosives shall be strictly followed.

4. When the wells have to be sunk close to each other and distance between them is not greater than the diameter of wells, sinking shall be taken up on all wells and they shall be sunk alternately so that sinking of all wells proceeds uniformly and together. In sinking dumb-bell or doubled shaped wells the excavation in both the dredge holes should be carried out simultaneously and equally to facilitate even sinking. All wells on which sinking is in progress shall be sunk to sufficient depth below the designed scour level before the seasonal floods. Further, they shall be temporarily filled and plugged before the onset of the floods so that they do not suffer any tilt or shift. All necessary precautions shall be taken against any possible damage to the foundations of existing structures in the vicinity of the wells, prior to commencement of dredging from the well. The dredged material shall not be allowed to accumulate over the well. It shall be dumped, as far away from the well as possible, and then continuously and simultaneously removed. In case the river stream flows along one edge of the well being sunk, the dredged material shall not be dumped on the dry side of the bank but on the side in which the river current flows. Very deep sump shall not be made below the well curb as it entails risk of jumping (sudden sinking) of the well; normally the depth of sump shall not exceed 3.0 meters below the level of the cutting edge unless otherwise specifically permitted by the Engineer-in-charge. In case a well sinks suddenly and with a jerk, the steining of the well shall be examined to the satisfaction of the Engineer-in-charge to see that no damage has occurred to it.

5. Tilt and shift of each well shall be measured regularly during the entire sinking operation. Observations to this effect shall be taken at each stage of casting of the steining. Simultaneously as the sinking proceeds, necessary corrective measures be taken to obtain the tilts and shift within the permissible limits. Unless otherwise specified the tilt of any well shall not exceed 1 in 80 and the shift shall not be more than 5% of the outside diameter of the circular well or of the maximum outside dimension of the well for any other shape subject to a maximum of 150 mm. If the tilt and shift exceed the above limit for any well, that well shall be liable to rejection at the discretion of the Engineer-in-charge at the entire risk and cost of the contractor. If under any circumstances the Engineer-in-charge allows tilt and/or the shift more than that specified above and which cannot be corrected, the

dimensions of the concerned well cap shall be suitably increased so as to cover completely the well top and also allow the pier to be located symmetrically, on the well cap provided that the stresses at the foundations of the well can be brought within permissible limits by suitably shifting the position of the pier center line to overcome the effect of the tilt and shift. No payment for any increase in the dimensions of well cap and the reinforcement therein shall be made. If even with the adjusted location of pier and increased dimensions of the well caps, the stresses at the foundation level due to tilt and shift can not be brought within permissible limits the contractor shall rectify the well or reconstruct the same at his own cost. In this even the contractor shall be paid only for new well sunk and the contractor shall also bear the additional cost resulting from any change in the design span length etc. due to such faulty well. The cost of the cement and steel supplied to the contractor and used in the rejected well as well as in the new well laid in its place shall be recovered from him. Payment of part or full rate during the process of sinking shall not be considered as part of full acceptance of the work till it is sunk to the designed or required level and satisfies the design requirements in regards to tilts and shifts.

6. Every well started during any working season must be completed, plugged, filled with sand and sealed with well cap at top within that working season so as to be safe from floods and tides as far as possible. If the sinking of a well upto the designed or required level, plugging it at bottom and top sand filling and concreting the well cap can not be completed in one working season, the following precautionary measures shall be taken by the contractor at his own risk and cost.

(i) All exposed reinforcing bars shall be carefully bent down along the stening and temporarily be embedded in lean concrete. (1:4:8)

(ii) The dredge holes shall be filled up with sand right upto top of well stening as cast and suitably covered up with adequate wooden planking or by any other method approved by the Engineer-in-charge.

(iii) All precautionary measures shall also be taken to prevent any damage or shift or tilt to the well due to floods during monsoon.

7. Measurement : Sinking of a well be measured from the water level at the time of casting the curb or from the level at which the bottom of the cutting edge is laid initially whichever is lower to the bottom of the cutting edge in the final position. Any scooping of the bottom of the foundation or 'Kundi' below the level of the bottom of the cutting edge shall not be measured or paid. If the level at which the bottom of cutting edge is actually laid is lower than the water level at the time of casting the curb, the same shall be recorded by the Deputy Ex- Engineer of the work and shall be recorded by the Deputy Ex- Engineer or Assistant Engineer-in-charge of the work and shall be countersigned by the contractor or his authorised representative in token of his acceptance. If for any valid reasons, in some very rare case, it becomes impracticable to lay the curb at or below the sub-soil water level, the contractor shall be permitted to lay the curb at level higher than the sub-soil level, but sinking shall be measured from water level only and in such cases, excavation above water level will, however, be payable under the item of open excavation for foundation of the relevant strata. For the purpose of payment the rate of sinking will vary according to range of depths as given in the schedule 'B' for this item.

8. The rate for sinking shall include the cost of all labour, tools and plant and other operations required, such as dewatering, excavation and bailing out material, providing and placing kentledge on top of well and removing the same, and contingencies warranting provision of temporary top plug in the event of floods being expected at site making further sinking not possible; and also other incidental works to sink the well to the level shown on the drawings, it shall also include blasting or use divers for removal of obstacles from under the cutting edge of the well. The rate shall be applicable for all types of soils except rock.

Item-17 B Extra for Sinking of wells/caissons in soft rock.

1. This item is for sinking of wells for foundation through soft rock such as lime stone, sand stone, laterite, hard conglomerate or other soft or disintegrated rock which do not require blasting. The classification of strata shall be decided by the Engineer-in-charge and his decision shall be final and binding to the contractor.

2. to 6. Para 2 to 6 of the item of sinking of wells in all sorts of soils shall apply.

7. Measurement for payment will be on Rmt. basis for the height sunk strata specified in para 1 above. The rate is extra over rate of sinking of well in all sorts of soils. In order to ascertain the level at which rock is struck with, four bores will be drilled at four equidistant locations near the inner periphery of the well, to a depth of 2 m. and the means of such four levels at which rock is struck with, will be taken as the level of such a strata.

8- The rate for sinking will be extra over the rate agreed in the proceeding item of sinking of wells/caissons in all sorts of soil and murrum and shall include the cost of all labour, tools and plant and other operations required such as dewatering, excavation and bailing out of material, providing and placing kentledge on top of well and removing the same, drilling four bores as above and Contingencies warranting provision of temporary top plug in the event of floods being expected at site Ticking further sinking not possible and also other incidental works to sink the well to the level shown on the drawings.

Item 17 C Extra for sinking of wells/caissons in hard rock.

1. This item includes sinking of well in rocks or boulders for which the use of mechanical plant or blasting is required. The classification of excavation shall be decided by the Engineer-in-charge and his decision shall be final and binding on the contractor. Merely the use of explosives in excavation will not be considered as a reason for higher classification unless blasting is clearly necessary in the opinion of the Engineer-in-charge. Where blasting is prohibited for any reason excavation shall be carried out by chiselling, wedging or any other agreed method. Blasting shall be carried out only with the written permission of the Engineer-in-charge. All the statutory laws, regulation rules, etc. pertaining to the acquisition, transport, storage, handling and use of explosives shall be strictly followed. The contractor may adopt any method or methods of blasting consistent with the safety and job requirement, after approval from the Engineer-in-charge.

2 to 6 Para 2 to 6 of the item of sinking of well in all sorts of soil shall apply.

7. Measurement for payment will be on Fmt. basis for the height sunk in strata specified in para 1 above. The rate is extra over rate of sinking of well in all sorts of soils. In order to ascertain the level at which rock is struck with, four bores will be drilled at four equidistant locations near the inner periphery of the well, to a depth of 2 m, and the mean of such four levels at which rock is struck with, will be taken as the level of such a strata.

8. The rate for sinking will be extra over the rate agreed in the preceding item of sinking of wells/caissons in all sorts of soil & murrum and shall include the cost of all labour, tools and plant and other operations required such as dewatering, excavation and bailing out of material, providing and placing kentledge on top of well and removing the same drilling four bores as above contingencies and warranting provision of temporary top plug in the event of floods being expected at site making further sinking not possible and also other incidental works to sink the well to the level shown on the drawings.

Item 17 D Extra for pneumatic sinking of wells/Caissons.

1. Para 1 to 6 of item of sinking of wells shall apply.

3. The resident engineers put in charge of pneumatic sinking shall familiarise themselves with particular reference to caisson diseases and working of the medical air-lock. A doctor competent to deal with the cases of 'Caisson Disease' or other complications arising as a result of working under high pressure, shall be stationed at the construction site when pneumatic sinking is in progress. The contractor shall provide complete facilities including the issuing of orders or the delegation of authority to the doctor, to ensure strict enforcement of the requirements outlined in these specifications. For pneumatic sinking provision made in IS : 4138 shall be complied with. In addition to IS : 4138 the safety provisions contained in the following paras shall also be strictly followed.

3. Locks, reducers, and shafting used in connection with caissons shall be of riveted construction throughout. The material used in their manufacture shall not be less than 6 mm. thick steel plate. Shafts shall be subjected to a hydrostatic or air-pressure test of 5.2 kg/cm^2 at which pressure they shall be tight and stamped on the outside shall about 30 cm. from each flange to show the pressure to which they have been subjected. Whenever a shaft is used it shall be provided, where space permits, with a safe proper, and suitable staircase for its entire length including landing platforms not more than 6 metres apart. Where this is impracticable, suitable ladders shall be installed with landing platforms located about 6 metres apart to break the climb. All shafting used in pneumatic caissons shall be provided with ladders which shall be kept clear and in good condition at all times and shall be constructed, inspected and maintained to the entire satisfaction of the Engineer-in-charge. All outside caissons air locks shall be provided with a platform not less than 1 metre wide and provided with a guard rail 1 metre high. Any caisson in which fifteen or more men are employed shall have two locks, one of which shall be used as a man-lock. Man locks and shafts shall be in charge of men whose duty shall be to operate the air valves in such locks. Locks shall be so located that the lowest part of the bottom door shall not be less than 1 metre above mean high water level. The supply of fresh air to the working chamber shall at all times be sufficient to permit work to be done without danger or excessive discomfort. All air supply lines shall be supplied with check valves and carried as near to the face as practicable. For every man-lock, reply signals repealing the original signals, shall be made before any cage, skip, bucket, or elevator is placed in motion. A man-lock shall be used solely for the compression or decompression of persons and not for the passage of plant or material and shall be maintained in a reasonably clean and sufficiently warm state. However, nothing in this shall prevent any person carrying with him into man-lock any hand-lock any hand-tools or hand instruments used for the purpose of the work. The specifications of preceding paragraph shall not apply where it is not reasonably practicable to provide a separate man-lock for persons only but in any such case not exempted by the specification given in succeeding paragraph that the lock when in actual use for the compression or decompression of a person or persons shall not be put, simultaneously, to any other and shall be in a reasonably clean and sufficiently warm state. Nothing in preceding paragraphs of these specifications shall apply to a lock which does not afford direct or indirect access to a working chamber in which the pressure exceeds 1.25 kg/cm^2 and in so far as a lock affords only indirect access to such a working chamber these paragraphs shall apply only whilst persons who have worked in the chamber are in the lock. Exhaust valves shall be provided, having risers extending to the upper part of chamber if necessary, and shall be operated at such times as may be required and especially after a blast, and men shall not be required to resume work after a blast until the gas and smoke have cleared.

4. Every employee absent from work for 10 or more consecutive days due to illness or other disability shall be required to pass the regular physical examination before being permitted to return to work. After a person has been employed continuously in compressed air for a period of 2 months, he shall be re-examined by the doctor and shall not be permitted work until such re-examination has been made and reported. The doctor shall at all times keep a complete and full record of examinations made by him, and the record shall contain dates on which examinations were made and a clear and full description of the person, examined, his age and physical condition at the time of examination and a statement as to the time such a person has been engaged in like employment. Records of such examinations shall be kept on file at the place where the work is in progress and shall be subject to inspection by authorities having jurisdiction. Every medical lock shall at all times have a doctor or other responsible person in attendance. When the doctor is absent, the person in charge shall have positive means of promptly communicating with and securing the services of a competent doctor in case of emergency. When the air pressure exceeds 1.95 Kg/cm^2 gauge or when 50 or more men are employed, a doctor shall be in attendance at all times while work is in progress. All cases of compressed air illness shall be reported and copies of all such reports shall be kept on file at the place where the work is in progress. No person known to be addicted to the excessive use of intoxicants shall be permitted to work in compressed air.

5. All lighting in compressed air chambers shall be by electricity exclusively and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automatically operative on failure of the regularly used source. The minimum intensity of light on way walk way ladder, stair-way, or working level shall be not less than one-quarter ($1/4$) candle-power and in all work places the lighting shall at all times be such as to enable workmen to see their way clearly. External parts of lighting fixtures and all other electrical equipment when within 2.5 meter of the floor shall be constructed of non combustible, non-absorptive insulating materials, except that metal be used provided it is effectively grounded.

Portable lamps shall be equipped with non-combustible, non-absorptive insulating sockets, approved handles, basket guards and approved cables. The use of worn or defective portable and pendant conductors, shall be prohibited.

6. Head frames shall be constructed of structural steel or open frame work fire-proofed timber. Head houses and other temporary surface buildings or structures within 30 metres of the shaft, caisson, or tunnel opening shall be built of fire-resisting materials. No oil gasoline, or other combustible material shall be stored within 30 metres of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fire-proof buildings, provided such buildings are not less than 15 metres from any shaft, caisson, or tunnel opening or any building directly connected thereto. Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in preceding paragraphs. Where feasible, a fire house connected to a suitable source of water shall be provided at the top of every caisson. Where fire mains are not accessible, a supply of water shall be stored in tanks near the top of each caisson, provided fire pails or suitable pumps are kept available, or approved fire extinguishers may be substituted. In the event that water under pressure is not available, buckets of sand and approved fire extinguishers shall be substituted. Wherever, in the execution of work in which compressed air is used, the working chamber is less than 3.7 metres in length, and when such caissons are at any time suspended or hung while work is in progress, in such a way that the bottom of the excavation is more than 2.7 metres below the deck of the working chamber, a shield shall be erected therein for the protection of the workmen.

7. Properly heated, lighted and ventilated rooms shall be provided for all employees engaged in compressed air-work. Such rooms shall contain lockers and benches & be open and accessible to men during the intermission between shifts. Adequate toilet accommodation at the ratio of not less than one for every twenty-five men employed shall be provided. Care shall be taken to keep all parts of caissons and other working compartments, including lockers, dry rooms, rest rooms and other equipment in a sanitary condition and free from refuse, decaying, or other objectionable matter. No nuisance shall be tolerated in the air chamber, smoking shall be strictly prohibited and all matches and smoking materials shall be left in the locker rooms. A separate dry-room shall be provided where working clothes may be dried within reasonable time. This room shall be well heated. In all cases where gas is expected including alluvium impregnated with decayed vegetable matter, the use of Day Safety Lamp in a pneumatic caisson sinking be compulsory.

8. Measurement shall be on Rmt. basis and shall be measured from the level of the cutting edge from which sinking by pneumatic process is started.

9. The rate for pneumatic sinking shall include cost of all labour, material, tools & plant and other incidental expenses required for pneumatic sinking. This payment shall be over the rate for the sinking by open dredging.

Item 18 : Load Testing of wells.

1. The well to be tested shall first be relieved of all the kentledge and other superimposed loads if any and then shall be filled inside to a depth of at least 3 m. above the cutting edge with sand. The sand filling may be done through water if standing in the well but it shall be ascertained that the well has been evenly filled with sand to a depth not less than 3 m. as above. Standing water need not be pumped out but before commencing the loading, it shall be allowed to attain a permanent level.

2. Marks for taking levels will then be made on the well steining at up stream and down stream and on the left and right sides of the well. For single well there shall be four marks and (or wells of other shape, six such marks. The reduced levels of all these marks shall be recorded carefully before commencing the test load.

3. The test load to be applied to a particular well shall be determined by the Engineer-in-charge. A load of 50 tonnes shall first be applied and the levels of all the marks shall be observed and recorded. The load will then be allowed to remain for 12 hours and the levels of all the marks again observed and recorded. A further load of 50 tonnes shall then be added and the whole process repeated till the full test load had been reached and allowed to remain for 12 hours. If the full test load is not a multiple of 50 tonnes the last increment will be less than 50 tonnes. Total settlement in 12 hours shall not be more than 8 cms.

4. Unloading also shall be done in steps of 50 tonnes with an interval of 12 hours between each unloading operation and the level observed at each stage just after unloading as well as 12 hours after that is just before further unloading. VI . results will then be plotted and settlement

against test load, the recovery of settlement against removal of test load and the permanent settlement of the well shall be noted. For this purpose average of the reading at all marks shall be adopted.

The test load for each well shall be equal to Steining $\frac{\text{area}}{\text{total areas of well}}$

(designed dead load + twice the live load).

The designed dead load shall be the one at the base of the well (under test) in the completed form of the bridge structure, less the weight of the steining already in position. The test load shall in no case be less than the maximum kentledge required during the sinking of the well.

5. The measurement for payment shall be per tonne of the test load actually placed on the well.

6. The unit rate includes all materials, labour equipment/plant platform gauges for purpose of recording results and sand filling in well before the test and its removal after the test, to complete the job.

Item 19-A. Ordinary concrete for Bottom plug.

1. For each well a written permission of the Engineer-in-charge to plug the well shall first be obtained. After this is done, divers shall be sent down to clean the inside faces of the curbs and to remove any adhering clay or other deposit therefrom, and to remove away any rubbish or loose material that may accumulate in the bottom. Before commencing plugging, all the loose material from the bottom of the well shall be removed and the depth of the bulb so formed more than 1/6 the dia. of the well shall be filled up with sand then with concrete. Careful soundings shall be taken and the entire bottom surface shall be brought to uniform grade.

2. The laying of concrete wherever and whenever possible shall be done in dry condition by pumping out water and where not practicable, concrete shall be laid under still water by tremie or by specially designed water tight collapsible drop bottom buckets or other approved methods as may be decided by the Engineer-in-charge. When laid under water concreting shall be done with water levels both inside as well as outside the well equal. Concreting under hydrostatic pressure shall not under any circumstances be permitted. No pumping shall be permitted during the course of concreting. The placing operations of concrete for the bottom plug shall be continuous without any break till the full thickness of the plug is formed to effectively seal the interior of the well without any laminations. The concreting by tremie or other method as may be approved by the Engineer-in-charge shall also conform to the requirements as per clause 13.2 of I.S. Code of practice for plant and reinforced concrete for general building construction No. IS : 456.1978.

3. Where tremie is used it shall be of suitable size having dia of not less than 25 cm. and the hopper large enough to hold not less than one entire batch of the mix or the entire contents of the transporting bucket when one is used. Each tremie shall be supported independently in such a manner as to permit free movement of the discharge and over the entire top surface of the work and so as to permit quick lowering when necessary to slow down or stop the flow of concrete. The consistency of concrete shall be got approved from the Engineer-in-charge and shall be laid by the most satisfactory method in proper manner.

4. After depositing, concrete shall be allowed to set for atleast 14 days during which period water in the well shall not be pumped nor disturbed for any purpose. After the plug concrete has sufficiently set i.e. after 14 days of concreting it shall be tested for water-tightness by dc watering the well to the extent of about 4.5 m. below the average water level or the tide level in the creek at the site of work. Necessary precautionary measures shall be taken against buoyancy of the well due to differential head of water acting from below by way of putting kentledge load on the well if so necessary before dewatering.

5. The well plug shall be considered satisfactory if after dewatering to the extent as above, the rate of leakage through or by the side of the plug is such as not to raise water level in the well by more than 0.3 Mt. in the first two hours. If the test does not prove successful and much leakage is noticed during the pumping, more concrete shall be deposited at the cost of the Contractor until the safe height is reached to effectively seal the leakage of water into the well.

6. Relevant specifications for ordinary concrete shall apply except for the above modification and additions.

7. The rate to be paid for this item shall be per cubic measurement of plug concrete actually laid. Generally the cubic quantity of concrete shall be calculated on the basis of average foundation level and the actual top level of the plug. For determining average level of the base, sounding shall be taken at different points in the well and levels recorded and signed by both the Engineer-in-charge and the contractor before starting the work.

Portable lamps shall be equipped with non-combustible, non-absorptive insulating sockets, approved handles, basket guards and approved cables. The use of worn or defective portable and pendant conductors, shall be prohibited.

6. Head frames shall be constructed of structural steel or open frame work fire-proofed timber. Head houses and other temporary surface buildings or structures within 30 metres of the shaft, caisson, or tunnel opening shall be built of fire-resisting materials. No oil, gasoline, or other combustible material shall be stored within 30 metres of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fire-proof buildings, provided such buildings are not less than 15 metres from any shaft, caisson, or tunnel opening or any building directly connected thereto. Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in preceding paragraphs. Where feasible, a fire house connected to a suitable source of water shall be provided at the top of every caisson. Where fire mains are not accessible, a supply of water shall be stored in tanks near the top of each caisson, provided fire pails or suitable pumps are kept available, or approved fire extinguishers may be substituted. In the event that water under pressure is not available, buckets of sand and approved fire extinguishers shall be substituted. Wherever, in the execution of work in which compressed air is used, the working chamber is less than 3-7 metres in length, and when such caissons are at any time suspended or hung while work is in progress, in such a way that the bottom of the excavation is more than 2.7 metres below the deck of the working chamber, a shield shall be erected therein for the protection of the workmen.

7. Properly heated, lighted and ventilated rooms shall be provided for all employees engaged in compressed air-work. Such rooms shall contain lockers and benches & be open and accessible to men during the intermission between shifts. Adequate toilet accommodation at the ratio of not less than one for every twenty-five men employed shall be provided. Care shall be taken to keep all parts of caissons and other working compartments, including lockers, dry rooms, rest rooms and other equipment in a sanitary condition and free from refuse, decaying, or other objectionable matter. No nuisance shall be tolerated in the air chamber, smoking shall be strictly prohibited and all matches and smoking materials shall be left in the locker rooms. A separate dry-room shall be provided where working clothes may be dried within reasonable time. This room shall be well heated. In all cases where gas is expected including alluvium impregnated with decayed vegetable matter, the use of Day Safety Lamp in a pneumatic caisson sinking be compulsory.

8. Measurement shall be on Rmt. basis and shall be measured from the level of the cutting edge from which sinking by pneumatic process is started.

9. The rate for pneumatic sinking shall include cost of all labour, material, tools & plant and other incidental expenses required for pneumatic sinking. This payment shall be over the rate for the sinking by open dredging.

Item 18 : Load Testing of wells.

1. The well to be tested shall first be relieved of all the kentledge and other superimposed loads if any and then shall be filled inside to a depth of at least 3 m. above the cutting edge with sand. The sand filling may be done through water if standing in the well but it shall be ascertained that the well has been evenly filled with sand to a depth not less than 3 m. as above. Standing water need not be pumped out but before commencing the loading, it shall be allowed to attain a permanent level.

2. Marks for taking levels will then be made on the well steining at up stream and down stream and on the left and right sides of the well. For single well there shall be four marks and (or wells of other shape, six such marks. The reduced levels of all these marks shall be recorded carefully before commencing the test load.

3. The test load to be applied to a particular well shall be determined by the Engineer-in-charge. A load of 50 tonnes shall first be applied and the levels of all the marks shall be observed and recorded. The load will then be allowed to remain for 12 hours and the levels of all the marks again observed and recorded. A further load of 50 tonnes shall then be added and the whole process repeated till the full test load had been reached and allowed to remain for 12 hours. If the full test load is not a multiple of 50 tonnes the last increment will be less than 50 tonnes. Total settlement in 12 hours shall not be more than 8 cms.

4. Unloading also shall be done in steps of 50 tonnes with an interval of 12 hours between each unloading operation and the level observed at each stage just after unloading as well as 12 hours after that is just before further unloading. V.I. results will then be plotted and settlement

against test load, the recovery of settlement against removal of test load and the permanent settlement of the well shall be noted. For this purpose average of the reading at all marks shall be adopted.

The test load for each well shall be equal to Steining $\frac{\text{area}}{\text{total areas of well}}$

(designed dead load + twice the live load).

The designed dead load shall be the one at the base of the well (under test) in the completed form of the bridge structure, less the weight of the steining already in position. The test load shall in no case be less than the maximum kentledge required during the sinking of the well.

5. The measurement for payment shall be per tonne of the test load actually placed on the well.

6. The unit rate includes all materials, labour equipment/plant platform gauges for purpose of recording results and sand filling in well before the test and its removal after the test, to complete the job.

Item 19-A. Ordinary concrete for Botton plug.

1. For each well a written permission of the Engineer-in-charge to plug the well shall first be obtained. After this is done, divers shall be sent down to clean the inside faces of the curbs and to remove any adhering clay or other deposit therefrom, and to remove away any rubbish or loose material that may accumulate in the bottom. Before commencing plugging, all the loose material from the bottom of the well shall be removed and the depth of the bulb so formed more than 1/6 the dis. of the well shall be filled up with sand then with concrete. Careful soundings shall be taken and the entire bottom surface shall be brought to uniform grade.

2. The laying of concrete wherever and whenever possible shall be done in dry condition by pumping out water and where not practicable, concrete shall be laid under still water by tremie or by specially designed water tight collapsible drop bottom buckets or other approved methods as may be decided by the Engineer-in-charge. When laid under water concreting shall be done with water levels both inside as well as outside the well equal. Concreting under hydrostatic pressure shall not under any circumstances be permitted. No pumping shall be permitted during the course of concreting. The placing operations of concrete for the bottom plug shall be continuous without any break till the full thickness of the plug is formed to effectively seal the interior of the well without any laminations. The concreting by tremie or other method as may be approved by the Engineer-in-charge shall also conform to the requirements as per clause 13.2 of I.S. Code of practice for plant and reinforced concrete for general building construction No. IS : 456.1978.

3. Where tremie is used it shall be of suitable size having dia. of not less than 25 cm. and the hopper large enough to hold not less than one entire batch of the mix or the entire contents of the transporting bucket when one is used. Each tremie shall be supported independently in such a manner as to permit free movement of the discharge and over the entire top surface of the work and so as to permit quick lowering when necessary to slow down or stop the flow of concrete. The consistency of concrete shall be got approved from the Engineer-in-charge and shall be laid by the most satisfactory method in proper manner.

4. After depositing, concrete shall be allowed to set for atleast 14 days during which period water in the well shall not be pumped nor disturbed for any purpose. After the plug concrete has sufficiently set i.e. after 14 days of concreting it shall be tested for water-tightness by dc watering the well to the extent of about 4.5 m. below the average water level or the tide level in the creek at the site of work. Necessary precautionary measures shall be taken against buoyancy of the well due to differential head of water acting from below by way of putting kentledge load on the well if so necessary before dewatering.

5. The well plug shall be considered satisfactory if after dewatering to the extent as above, the rate of leakage through or by the side of the plug is such as not to raise water level in the well by more than 0.3 Mt. in the first two hours. If the test does not prove successful and much leakage is noticed during the pumping, more concrete shall be deposited at the cost of the Contractor until the safe height is reached to effectively seal the leakage of water into the well.

6. Relevant specifications for ordinary concrete shall apply except for the above modification and additions.

7. The rate to be paid for this item shall be per cubic measurement of plug concrete actually laid. Generally the cubic quantity of concrete shall be calculated on the basis of average foundation level and the actual top level of the plug. For determining average level of the base, sounding shall be taken at different points in the well and levels recorded and signed by both the Engineer-in-charge and the contractor before starting the work.

8. The method of measurement may however be changed at the discretion of the Engineer-in-charge in case it is difficult to ascertain the correct depth of plug laid, in which case quantity to be paid shall be based on the average yield of the finished concrete under water per bag of cement, which shall be taken as 0.15 cmt. per bag of cement consumed. This shall include extra 10% cement to be used for concrete to be laid under water.

9. Unit rate of the item shall include cost of labour, materials, tools and plant required to complete the work.

ITEM-19 B ORDINARY CONCRETE FOR TOP PLUG

1. Before concreting, the well shall be dewatered to the extent required, to enable the concrete of the top plug to be laid at the level, as shown on the detail drawing or as directed by the Engineer-in-charge.

2. Relevant specifications for ordinary concrete shall apply except for the above modification and additions.

3. The rate to be paid for this item shall be per cubic measurement of plug concrete actually laid, and is inclusive of the cost of dewatering where necessary.

4. Unit rate of the item shall include cost of labour, materials, tools and plant required to complete the work.

It is imperative to do videography before filling the bottom plug.

ITEM- 20 Providing Mild Steel dowel bars for Foundations.

1. This item provides for necessary mild steel bar, of 32 mm. dia. for anchoring in foundations strata as per detailed drawings and as directed by Engineer-in-charge. For this purpose, 100 mm holes shall be kept in steining itself at regular intervals as shown in drawing or as directed by Engineer in-charge. Mild steel bars shall be supplied by the department at the rate and place shown in schedule A of the tender. The item includes transporting the bars to the site of work, handling, cutting, bending, hooking and placing the same in position as required as per drawing. The grout holes shall be not less than 100 mm. dia. The anchorage length of bars shall not be less than 60 times dia. of bar. Grouting of grout holes shall be of 1:2 proportion (1 part of cement, 2 parts of sand) and shall be done under pressure as directed. These dowel bars shall be inserted through holes kept in the well steining to the bottom of the grout holes. Grout holes shall not be less than 1 M. in depth. In case, no dowel bars are ultimately decided to be provided in the holes of the steining kept for the purpose, the same shall be filled with the concrete of the same proportion as of well steining at the cost of the contractor.

2. Mode of measurement will be per number of dowel bar considered as one number from bottom of grout hole to the top of steining.

3. Unit rate includes cost of material, labour, tools and plant and grouting the steining holes to complete the work.

(A) Mild Steel Reinforcement

Item-21 Providing (B) High yield strength Deformed bars, reinforcements.

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

2. Steel shall be clean and free from loose rust and loose scale at the time of fixing in position and subsequent concreting.

3. Reinforcing steel conform accurately to the dimensions given in the Bar bending schedules shown on relevant drawings. Bars shall be bent cold to the specified shape and dimensions or as directed by the Engineer-in-charge using a proper bar bender, 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 on work; they shall be not heated to facilitate bending. Unless otherwise specified a 'U' type hook at the end of each bar shall invariably be provided. 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 the diameter of the round bar. In the case of bars which are not round and in the 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 splitting of the concrete.

4. 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 conforming to IS : 280 and by using stay blocks or metal chairs, spacers, metal hangers supporting wires or other Approved devices at sufficiently close intervals. Bars will not be allowed to sag between supports nor displaced during concreting or any other operation of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports will not extend to the surface of concrete, except where shown on the drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing will 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, precast mortar blocks or other approved devices. Reinforcement after being 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 protect reinforcement from corrosion concrete cover shall be provided as indicated on the drawings. All bars protruding from concrete and to which other bars are to be spliced and which are likely to be exposed for an indefinite period shall be protected by a thick coat of neat cement grout.

5. Bars crossing each other, where required, shall be secured by binding wire (annealed) of size not less than 1 mm. and conforming to IS : 280 in such a manner that they do not slip over each other at the time of fixing and concreting.

6. As far as 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. or 1.25 times the maximum size of the coarse aggregate whichever is greater, by concrete between them. Where not feasible, overlapping bars shall be bound with annealed steel wire, and not less than 1 mm. thickness twisted tight. The overlaps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum.

7. Whenever indicated on the drawings or desired by the Engineer-in-charge bar shall be jointed by couplings which shall have a cross-section sufficient to transmit the full stresses of bars. The ends of the bars that are jointed by couplings shall be upset for a 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 white iron threads. Steel for coupling shall conform to IS : 226.

8. 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 is not subject to more than 75 per cent of the maximum permissible stresses and welds so staggered that, at any one section not more than 20 per cent of the rods are welded. Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work will be accepted. Suitable means shall be provided for holding the bars securely in position during welding. It must be ensured that no voids are left in welding and when welding is done in 2 or 3 stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M. S. Electrodes used for welding shall conform to IS : 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of tests shall be as directed by the Engineer-in-charge.

9. For the purpose of calculating consumption, wastage shall not be permitted beyond 5 percent. Excess consumption over 5% will be charged at penal rate. Useful pieces of steel, as may be decided by the Engineer-in-charge shall be taken back by the Government at issue rate and at P.W.D. Store from where the steel was supplied. All the expenses of loading, carting, unloading and returning the waste will be borne by the contractors.

10. Reinforcement shall be measured in length remaining overlaps, separately for differed diameters as actually used in the work, where welding or coupling is restored to, in place of lap-joints such joints shall be measured for payment as the equivalent length of over-lap as per design requirement. From the length so measured the weight of reinforcement shall be calculated in tonnes on the same basis of IS : 1732 even though steel is supplied to the contractor by the Department on actual weightment. Length shall include hooks at ends. Wastage and annealed steel wire for binding shall not be measured and cost of these items shall be deemed to be included in the rates to reinforcement.

11. Rate for reinforcement shall include cost of all steel, its carting from P.W.D. Store to work site, cutting, bending, placing, binding and fixing in position as shown on the drawings and as directed by the Engineer-in-charge. It shall also include cost of all devices for keeping reinforcement in approved position, cost of Joints as per approved methods, and all wastage, and spacer bars.

Item 22-Empty boring through all sorts of strata for R.C.C Road pipes.

1. The diameter of the piles shall be as given in the item. The casing pipe shall be of sufficient thickness and strength to hold its original form and show no harmful distortion after it an adjacement shells have been driven and the driving core, if any, has been with drawn/Where bore cast-in-situ piles are used in soils liable to flow the bottom of the casing shall be kept enough in advance of the boring tool to prevent the entry of soil into the casing, thus preventing the formation of cavities and settlements in the adjoining ground. The water level in the tube should also be maintained at the natural ground water level until the tube is sealed. The joints of the casing shall be made as tight as possible to minimise inflow of water or leakage of air, where compressed air employed to facilitate concreting. Before concreting, where the use of compressed air is unnecessary, the bottom of the boring shall be plugged and dired as far as possible.

2. Casing of pipes will be allowed to be withdrawn if possible without any reduction in the rate. In case, casing pipes can not be withdrawn due to site-conditions, the cost of pipes shall be borne by the Contractor and that he shall not be entitled to any payment for non withdrawal of the pipes. The displacement or distortion of reinforcement during these operations and shall while extracting the tube shall be avoided. After installation to final depth and immediately before placing the concrete the inside of the tube or bore shall be free from any foreign matter.

3. The reinforcement in the pile shall be exposed for a sufficient distance to permit it to be adequately bended into the pile cap. In cases where the pile cap is to be laid on ground a levelling course of 1:4:8 lean concrete 8 cm. thick shall be provided.

4. The measurement shall be in metres of the piles ordered in writing by the Engineer-in-charge, measured from the head to the but of the shoe or the tapered point.

5. Unit rate includes boring through all sorts of strata, providing necessary casing pipe, materials, labour and equipment to complete the work. Steel for reinforcement and concrete for piles will be paid separately.

Item 23-Load Testing of Piles

1. Load test may be carried out as decided by the Engineer-in-charge on one or more working piles. Preloading shall be not less than one and a half times the estimated safe load carrying capacity of the pile in case of sandy soils and two times the estimated safe load in the case clayey soils.

2. The test shall commence as early as possible after driving of the piles.

The test shall be carried out by applying a series of load on R.C.C. Cap over a pile or group of piles unaided by any other support. The load shall preferably be applied by means hydraulic jack reacting against a loaded platform or against heavy R.S. Joists or a suitable frame held down by anchor piles or other anchorages, which shall be pre-loaded to not less than one and-a-half times the estimated safe load carrying capacity of the pile. The load applied by jack should be co-axial with the test pile. Wherever tension piles or other suitable anchors are used to sustain the loaded platform, the centre distance between the test pile and anchor pile should minimum of 5 times the test pile diameter. The hydraulic jack used shall be of adequate capacity and shall have a pressure gauge and a remote control pump.

3. Before load test is performed, the proposed set up and the load frame shall be approved from the Engineer-in-charge. Readings of settlement and rebound shall be recorded the help of

at least two dial gauges (preferably four) of 0.02 mm. sensitivity and resting on a diametrically opposite ends of the pile cap. The dial gauges shall be fixed in a datum bar whose ends rest upon non-movable supports. The supports for datum bar with reference to which the settlement of the pile would be measured shall be at least 5 'd' away, clear from the piles, where 'd' is the diameter of the pile subject to a minimum of 2 meters for good sandy soils and 5 metres for loose soils.

4. The test load shall be applied in equal increments of about one fifth of the estimated safe load and reduced to smaller increments at the final stages as or directed by the Engineer-in charge. Alternate loading and unloading of each load increment shall be performed and the elastic and plastic settlement recorded.

5. Each stage of loading or unloading shall be maintained till the rate of movement of the pile top is not more than 0.02 mm. per hour in case of clay soil and 0.1 mm. per hour for sandy soil.

6. The loading shall be continued upto 1 1/2 times the estimated safe load on the pile or when the total settlement of pile top/cap equals the value specified below.

Assessment of safe load shall be as under:

(a) Two-thirds of the final load at which the total settlement attain a value of 12 mm unless it is established that a total settlement different from 12 mm. is permissible in a given case on the basis of nature and type of the structure; in the latter case the actual total settlement permissible shall be used for assessing the safe load instead of 12 mm.

(b) For a group of piles, two-thirds of the final load at which the total settlement attains a value of 40 mm.

7. Lateral load test.-This test shall be carried out at the cut off level of the piles. Two or more test pile which may be part of the working piles driven to the required depth and spacing shall be used for the tests. The lateral load at the cut off level shall either be applied by a jack inserted between the piles or by some other arrangement capable of facilitating the application of desired pull.

The loading shall be applied in increments of about 20 percent of the estimated safe load, reducing to smaller increments in the final stages of the test. The next increment shall be applied after the rate of displacement is about 0.05 mm. per hour in sandy soils and 0.02 mm. per hour in clayey soils or two hours whichever is earlier.

Lateral displacement shall be recorded by using at least two dial gauges spaced at 30 cm. and kept horizontally one above the other on each pile. Where it is not possible to locate the dial gauges in line of the jack axis, then the two dial gauges be kept at a distance of 30 cm. at a suitable height and the displacement at load point, interpolated from similar triangles.

The safe lateral load on the pile shall be taken as the least of the following :

(a) 50 per cent of the final load at which total displacement increases to 12 mm.

(b) Final load at which total displacement corresponds to 5 mm and,

(c) Load corresponding to any other specified displacement due to performance requirements.

8. The measurement for payment shall be per number of load test on piles.

9. The Unit includes all materials, labour, equipment plant, platform, gauges for the purpose of recording result to complete the job.

ITEM 24 A Coursed Rubble stone Masonry in cement mortar without cement Pointing.

1. Stone shall be hard, sound free from cracks decay and weathering and shall be freshly quarried from approved quarry. Stone, with round surface shall not be use. The Stones when immersed in water for 24 hours shall not absorb water by more than 5 per cent of their dry weight when tested in accordance with IS : 1125. The length of stone shall not exceed three times its height and the breadth on base shall not be greater than three fourth of the thickness of wall not less than 15 cm. Minimum crushing strength of stone shall not be less than 105 kg/sq.cm.

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

3. The mixing shall be done intimately, on a clean water tight platform. Cement and sand shall be first mixed dry in the required proportion to obtain a uniform colour and then after addition of water the mortar shall be mixed for at least two minutes. In case cement mortar has stiffened because of evaporation of water, the same shall be retempered by adding water as frequently as needed to restore the requisite consistency but this retempering shall be permitted only within thirty minutes from the time of addition of water at the time of initial mixing.

4. Dressing of stone shall conform of the general requirements for dressing of stone covered in IS : 1129. Stone shall be sufficiently wetted before laying to prevent absorption of water from mortar. The bed which is to receive the stones shall be cleaned wetted and covered with a layer of fresh mortar. All stones shall be laid full in mortar both in bed and in vertical joints and settled carefully in place with a wooden mallet immediately on placement so that it is solidly bedded in before the same has set. Clean chips and spalls shall be wedged into the mortar joints and beds wherever necessary to avoid thick beds or joints of mortar. Whenever foundation masonry is laid directly on rock, the face stones of the first course shall be dressed to fit into the rock snugly when pressed down in the mortar bedding over the rock. No dry or hollow space shall be left anywhere in the masonry and each stone shall have all the embedded faces completely covered with mortar. Vertical joints shall be staggered as far as possible. Sufficient transverse bond shall be provided by the use of bond stones extending from the front to the back of the masonry. In case of thick walls bond stones shall overlap each other their arrangement. Bell shaped bond stones or headers shall not be used.

5. At all angular junction stones at each alternate course shall be well bonded into the respective course of the adjacent wall. All connected masonry in structure shall be carried up at one uniform level throughout as far as possible but when breaks, are unavoidable, the masonry shall be raked in sufficient long steps to facilitate jointing of new work with old. The stepping of ranking shall not be more than 45° with the horizontal. Wing walls, abutments and piers, etc. shall be carried up truly plumb or to the specified batter. Face work and hearting shall be brought up evenly. The top of each course, however shall not be levelled up by use of flat chips.

6. Stones shall be hammer dressed on the face, the sides and beds to enable it to come in proximity with the neighbouring stone. The bushing on the face shall be more than 4 cm. on exposed face. Chips and spalls of stones may be used wherever necessary to avoid thick mortar beds or joints and it shall also be ensured that no hollow spaces are left anywhere in the masonry. The chips shall not be used below hearting stones to bring these up to the level of face stones use of chips shall be restricted to filling of interstices between the adjacent stones in hearting and they shall not exceed 20 per cent of the quantity of stone masonry.

7. The hearting or interior filling wall face shall consist of rubble stones not less than 15 cm. in any direction carefully laid, hammered down with a wooden mallet into position and solidly bedded in mortar. The hearting should be laid early level with facing and backing. Through bound stones shall be provided in masonry upto 60 cm. thickness and in case of masonry above 60 cm. thickness a set of two or more bond stones overlapping each other at least by 15 cm. shall be provided in a line from face to back. In case of highly absorbant type of stones (porous limestone and sand stones, etc.) the bond stone shall extend only about two-third into the wall, as through stone in such cases may give rise to penetration of dampness and, therefore, for all thickness of such masonry a set of two or more bond stones overlapping each other by at least 15 cm. shall be provided for every 0.50 square metres of the masonry surface. Bond stone shall be stacked separately and marked to distinguish from other stones. Masonry work shall be started after sufficient number of bond stones are collected on site as directed by the Engineer-in-charge. Vertical bound stones shall be inserted at the rate of one per 3 sq.mt. and shall be staggered.

8. The quoins shall be laid header and stretcher alternately. Every stone shall be fitted to the adjacent stones so as to form neat and close joint. Face stone shall extend and bond well in the back. These shall be arranged to break joints, as much as possible, and to avoid long vertical lines of joints.

9. The face joints shall be more than 20 mm thick but be sufficiently thick to prevent stone to stone contact and shall be completely filled with mortar.

10. Green work shall be protected from rain by suitable covering. Masonry work in cement or composite mortar shall be kept consistently moist on surface for a minimum period of seven days. The top of the masonry work shall be left flooded with water at the close of the day. During hot weather all finished or partly completed work shall be covered or wetted in such manner as to prevent rapid drying. The raking of joints, where necessary shall be done at the end of day's work when mortar is green.

11. The scaffolding shall be found and strong to withstand all loads likely to come upon it. The holes which provide resting space for horizontal members shall not be left in masonry under one metre in width or immediately near the screw backs or arches. The holes left in the masonry work for supporting the scaffolding shall be filled and made good.

12. When fresh masonry is to be placed against existing surface of structure, these shall be cleaned of all loose material, roughened and wetted as directed by the Engineer-in-charge as to effect a good bond with the new work.

13. Stone masonry shall be measured in cubic metres.

14. The unit rate for stone masonry work shall include the cost of all labour, materials, tools and plant, scaffolding and other expenses incidental to the work.

15. Masonry shall be laid with courses. Where there is variation in the height of courses, larger courses shall be placed at lower levels, with height of courses decreasing gradually towards the top.

16. In case of abutment and wing walls, weep holes shall be provided in the masonry to drain moisture from the backfilling. Weep holes shall be 8 cm. wide, 15 cm. high or circular of 15 cm. diameter and shall extend through the full width of the masonry with slope of about 1 vertical to 20 horizontal towards the draining face. The spacing of weep holes shall be generally 1 m. in either direction with the lowest one at about 15 cm. above the low water level or ground level whichever is higher or as directed by the Engineer-in-charge.

ITEM-24 B Coursed rubble : stone masonry in Cement mortar with Cement pointing

Para 1 to 16 item of coursed rubble stone masonry in cement mortar without cement pointing shall apply.

Para 17 to 22 : Para 1 to 6 of item of cement pointing in cement mortar shall apply.

ITEM-25 Uncoursed rubble stone masonry in Cement mortar with cement. Pointing.

Para 1 to 14 : Para 1 to 14 of item of coursed rubble stone masonry shall apply.

Para 15 to 20 : Para 1 to 6 of item of cement pointing in cement mortar shall apply.

ITEM 26 Extra for Khanki facing.

1. Relevant specification of item of C.R. Masonry shall apply.

2. Khanki facing shall be provided for the depths shown in the drawings or upto 30 cm. below the probable depth of exposure of masonry or as may be directed by the Engineer-in-charge. At least 50 per cent of the khankies shall tail twice their height into the masonry. 5 cm. chisel draft shall be provided at the end of the straight portions of the piers near cut and ease waters for checking the batters which shall be uniform throughout. Cut and ease water shall be provided exactly to the shapes shown in the plans and their face work shall correspond to that of the straight portion of the piers. 5 cm. chisel drafts shall be provided on both sides of the noses of the Cut and ease waters to check that the batters are uniform. 'Jose stones shall be laid header and stretchwise.

3. For cement pointing, relevant specification of that item shall apply.

4. Khankis shall be properly dressed due vertical and horizontal at least for 25 mm. on all sides of the joints and it shall at least project 1.2d times inside than the height of the same. The joints shall then be pressed as soon as the mortar has begun to set and the hollow spaces be filled with fresh mortar, tapped and pressed to allow the mortar to consolidate in the joints. Joints shall be rubbed straight truly vertical and horizontal. After rubbing, the extra mortar found spread on the edges of joints shall be carefully scraped off to give a neat appearance. Joint will be raked to 6 mm. depth when the mortar is fresh.

5 Measurement for payment shall be on Smt. basis of the surface areas of Khanki facing. Nothing shall be deducted in the item of C.R. Stone masonry for Khanki stones used under this item.

6. Unit rate includes all material, labour, tools & plant to complete the job.

ITEM-27 Providing M.S. Dowel bars in sub-structure for [A] free [B] fixed end

1. For Mild Steel, specifications for Me reinforcement shall apply.
2. The M.S. dowel bars shall be provided and anchored in pier caps, abutment caps and super-structure as per detailed drawings for free ends and fixed ends. G.I. Pipes and other, materials such as mastic asphalt as directed by Engineer-in-charge or as per drawing shall be provided G.I. pipes shall as approved by-Engineer-in-charge.
3. The payment shall fee made per number of dowel bars in anchored condition.
4. Unit rate shall include cost of all materials, labour and equipments to complete the Job.

ITEWI-28 Miled Steel & cast steel bearings.

(A) Fixed & sliding plate bearings.

(B) Roller & Rocker bearings.

1. This work shall consist of furnishing and fixing in position of bearings in accordance span to details shown on the drawings. Bearing plates, bars, rockers, assemblies, and other exhistion or fixed devices shall be constructed in accrodance with the details shown the drawings, when bearing assemblies or plates are shown to be placed (not embecied) directly on concrete in the drawings, the concrete bearing area shall be constructed slightly above grade and shall be finished by grinding. It shall be ensured that the bearings are set truly level and in exact position as indicated on the drawings so as to have full and even bearing on the seats. Thin mortar pads (not exceeding 12 mm.) may be made to meet with this requirement. .It shall be ensured that the bottoms of girders to be received on the bearings are plane at the location of these Bearings and care shall be taken the bearings are not displaced while placing the girders. Wherever rockers and rollers are provided for expansion or construction of superstructure spans longer than 30 metres, they shall be so adjusted at the time of placement that after subsequent computed or expected movement of the bridge seat, the line of bearing is as central as possible on the bearing plates at normal design temperature.

2. Materials for bearings shall conform to I.S.S. Cat steel component thicker than 200 mm. shall be subjected to radiographic, ultrasonic or any other accepted method of testing to check the quality of casting. Mild steel for roller shall be made from Cl. III or Class IV steel in accordance with IRS Specification of relevant items. It may alternatively be turned from carriage or wagon axles.

3. All work shall strictly conform to the drawings. Care shell be taken to ensure that all parts of an assembly fit accurately together. The workmanship shell satisfy all relevant provisions laid down in specification of cutting edge. Knuckle pins, rolling surfaces of the rollers and bearing surface of the bearing plates shall be machined and all bolt holes shall be drilled. The whole bearings shall be fitted and finished as required for good quality machined work to the satisfaction of the Engineer-in-charge. However, bearings which are to be grouted or bedded on a suitable yeilding materials on any surface which is to be in permanent contact with the grout or the yeilding material, may be left unmachined.

4. Tolerance for individual components or of the assembled bearing shall be as shown in the drawings or subject to the approval of the Engineer-in-charge. Unless otherwise specified, the following tolerances shall be maintained. Tolerances on diameter or rollers and all convex surfaces shall conform to K7 of IS : 919. Tolerances on diameter of all concave surfaces shall conform to D8 of IS : 919. Tolerances on the height of any component casting shall not exceed + 0.5 mm. No minus tolerance will be allowed. The edges of all ribs shall be paralld throughout their length. Tolerance on length and width of the base plate shall not exceed 5 mm. All rolling, rocking and sliding surfaces shall have a machine smooth finish to 20 micron maximum mean deviation as per IS : 3073.

5. The contractor shall, whenever required in the course of manufacture, arrange and afford all facilities for the purpose of inspection and tests for all or any the parts of bearings and materials used therein to any officer of the Directorate of Inspection of the Ministry of works, Production and Supply of the Government of India or Gujarat Government Department, and shall obtain necessary certificate of having satisfied the requirements. All inspection charges shall be payable by the Contractor. In addition to the certificate to be obtained from the officer of Government of India regarding metallurgical composition and tests on samples of metal used in casting or in manufacture of the bearings as referred in the foregoing

paras above, the contractor shall make all necessary arrangement at his cost, to carry out load test, on at least 5 per cent of the total number of bearings, in the presence of the Engineer-in-charge or his authorised agent for 1 1/2 times the designed load of bearings and unless the tests give satisfactory results duly certified in writing by the Engineer-in-charge or his authorised agents, no bearing shall be permitted to be used on the work. In case the test results are not satisfactory all the remaining of the extra number of bearings as may be decided by the Engineer-in-charge shall have to be tested at his risk and cost in similar manner and only those number of bearings which stand the test satisfactorily and are certified as passed by the Engineer-in-charge shall be allowed to be used on works and the contractor shall not have right or claim for the rejected bearings. The tests shall be considered successful if noticeable dents are not formed at points of contacts or no undesirable flaws are noticed in the surface of the bearings after the test.

6. All bearings shall be surrounded by grease boxes of either R.C.C. or mild steel plates. The size of the grease box shall be adequate to cover the bottom plate and its height will be upto the top of the top plate. The grease box shall be filled fully with the grease, of the relevant I. S. Specification.

7. Bearings fixed at free end and fixed end should be counted separately. Bearings shall be measured per number consisting of bottom and top plate in case of fixed, sliding and rocker bearings; and roller bottom and top plates in case of roller bearings and all other accessories.

8. The rate for each type of bearing shall include the cost of supplying and fixing the bearings in position complete as specified on the drawings or as directed by the Engineer-in-charge. The rate shall also include the cost of samples and their testing as desired by the Engineer-in-charge. The rate shall include the cost of all nuts, bolts, supplying and filling the grease boxes with the specified grease.

ITEM 29. Restrained Elastomer Bearings.

1. The term 'bearings' in this case shall refer to an elastomeric bearing consisting of one or more elastomer slabs bonded to metal plates during manufacture so as to form a sandwich arrangement, while 'Bearings Pads' shall, denote single unreinforced elastomer slabs.

2. The elastomer to be used for bearings shall be made from natural or synthetic rubber and satisfy the physical properties given below. The test pieces required for the tests shall be selected from the centre layer of the bearings while making up the selection.

| ITEMS | ASTM Designation | Requirement |
|---|-----------------------|--|
| (i) Durometer Hardness | D - 2240 | 55 to 70 (# 5 Points for the nominated Value). |
| (ii) Ultimate Tensile Strain per cent | D - 412 | 450 for 55 grade 400 for 60 grade 300 for 70 grade. |
| (iii) Tensile Strength Kg/cm ² . | D - 412 | 175 minimum 135 minimum for natural rubber of harness greater than 65. |
| (iv) Adhesion to Metal Kg/cm ² . | D - 429 (Method - B) | 9 |
| (v) Tear Resistance Kg/cm. | D - 624 40 (DIEC) | |
| (vi) Compression set 22 hrs. At 70° C % | D - 395 (Method - B) | 25 maximum |
| (vii) Ozone resistance 22% strain 100 hrs. 380° C ± 10° C (1 part per million in air by volume). | D - 1149 | No cracks. |
| (viii) Accelerated ageing 70 hours, 1000 C Hardness increase. Tensile strength reduction, Elongation At break reduction. | D - 573 | 10 points. 15% of original. 25% of original. |
| (ix) Low temperature stiffness young's Modulus - 40° C Kg/cm ² . | D - 797 | 700 maximum. |

3. Adhesive used in bearing location attachment to bridge decks shall be subject to the approval by the Engineer-in-charge. It shall be of high viscosity resins, which are cold setting and free of solvent. Adhesive shall not be used to bond layers of cured elastomer. Mild steel used for plate reinforcement shall comply with the requirements of relevant I.S. The Contractor shall furnish to the Engineer-in-charge a certificate by the Manufacturer that the elastomer and fabric (if used) in the elastomeric bearing conforms to all the above requirements. The certification shall be supported by a certified copy of the results of tests, performed by the Manufacturer upon samples of the elastomer and fabric to be used in the bearings.

The contractor shall, whenever required, during the course of manufacture arrange and offer all facilities for the purpose of inspection and test of all or any of the material used therein, to any officer as directed by the Engineer-in-charge and the bearings and similar parts shall be used in the superstructure except on the production of certificate of acceptance thereof from the Directorate of Inspection whenever necessary. All the inspection charges shall be payable by the contractor.

4. The thickness of a single layer bearing shall not exceed 20 per cent of the least plan dimension. The total thickness of a laminated bearing shall not exceed 40 per cent of the least plan dimension. The thickness of any internal layer of elastomer shall not be less than 6 mm. nor greater than 12 mm. The thickness of outer plates shall be not less than 3 mm. and that of inner plate not less than 1.5 mm. Metal plates in which dowels are located shall be, in general, not less than 6 mm. thick. The edges of all plates shall be lightly rounded to approximately 5 mm. radius. The metal plates referred above should not be composed of thinner plates joined together. Laminated Bearings shall have side cover of elastomer of minimum thickness of 6 mm. to protect the ends of the steel plates and to give a reduced surface strain to that occurring at the edge of the bonded platen but shall not be considered in evaluation of deformations. The cover of elastomer at the top and bottom surfaces shall not be less than 3 mm. or more than half the thickness of internal layer. The outer cover at top and bottom surfaces having thickness less than half that of a single internal layer and not exceeding 3 mm. may be considered as a simple protection and need not therefore be considered in calculating deflections. Where above elastomer covers are provided, there is no objection to keeping the thickness of top most and bottom most plates same as that of inner plates.

5. Bearing shall be set back from the edge of a bearing surface a distance not less than the thickness of the layer of elastomer in contact with bearing surface to allow for spreading of the elastomer under load. Bearings may be located in position by means of dowels or studs or other devices, or bonded to the structure with approved adhesives which shall generally be of the high viscosity resin type cold setting and free from solvent. For spans on an inclined grade and without hinge bearings: the sole plates shall be provided and the same bevelled so that masonry surfaces and the bearing shall be kept horizontal. To facilitate maintenance, the ends of trusses and plate girders shall preferably be supported on plates or pedestals so that there is at least 15 centimetres clearance between the bottom chord or flange and the substructure. The plan dimensions of the bearings to be finally adopted shall preferably be selected from series 'R' 20 of IS : 1076. The arrangement of placing only one bearing under a girder shall be permitted. Further, bearings of different sizes must not be placed next to each other to support a span. The bearings shall be fully moulded when metal laminations are used. These laminated elastomeric bearings shall consist of one or more elastomer slabs bonded to metal plates so as to form a sandwich arrangement. Such fully moulded bearings shall be manufactured to required size. The bond between elastomers and metal or fabric shall be such that, when a sample is tested for separation, failure shall occur within the elastomers and not between the elastomer and metal.

6. The contractor shall get the bearings tested for the physical properties and performance of bearings. The test pieces required for the test shall be selected from the Central layer of bearing making up the selection. For the Size of the test pieces and method of tests etc. the relevant A.S.T.M. Standard shall be Followed. The tests shall be carried out in a recognised laboratory acceptable to the department for all the necessary tests required by the Department. The specimen for tests as may be required shall be supplied by the contractor at his own cost and the testing charges shall also be fully borne by the contractor. Only those bearings which pass the tests satisfactorily will be accepted and will be permitted to be used. The Department shall not accept any responsibility for the cost of bearings rejected.

- | | | |
|----|--|---------------|
| 7. | (i) Tolerances on length and width | 0, +5 mm. |
| | (ii) Tolerances on thickness for single layer pad. | ± 0.5 mm. |

(iii) Tolerance on total thickness.

'h' of finished bearings.

| | | |
|----------------------|---|---------------|
| $10 < h \leq 30$ mm | : | ± 0.5 mm. |
| $30 < h \leq 50$ mm | : | ± 0.8 mm. |
| $50 < h \leq 80$ mm | : | ± 0.9 mm. |
| $80 < h \leq 120$ mm | : | ± 1.1 mm. |

(iv) The parallelism of the individual elastomer laminations for a finished bearing, shall not exceed the tolerance specified at (ii) above when measured at the extremities of the laminations.

8. Proper arrangement shall be made to avoid corrosion of metal plates or deteriorating of adhesive by encasing the bearings totally in elastomer or by some other method approved by the Engineer in charge.

9. (i) When bearing assemblies on plates are shown on the drawing to be placed (not embedded) directly on concrete, the concrete bearing area shall be constructed slightly above grade and shall be finished by grinding.

(ii) It shall be ensured that bearings are set truly level and in exact position as indicated on the drawings so as to have full and even bearing on the seats. Thin mortar pads (not exceeding 12 mm.) may be made to meet with this requirements.

(iii) It shall be ensured that the bottoms of the girders to be received on the bearings are plane at the location of these bearings and care shall be take that the bearing are not deplaced while placing the girders.

(iv) Before fixing the elastomeric bearings the concrete surface on which the bearings is to be placed shall be wood float finished to a level plane which shall not vary mores than 1.5mm from a straight edge placed in any direction across the ares.

(v) The position of the bearings shall be accurately marked on the pier/abutment cap and the area where the bearings are to be located levelled accurately.

(vi) The concrete surface shall be free from any loose material and cleared of any grease oil, paint etc., and it shall be dry at the time of fixing.

(vii) The surface of elastomer shall be free any foreign material.

(viii) Once prepared, the concrete or elastomer shall not be touched with bare hand.

(ix) The bearings shall be covered with canvas or a suitable covering material to protect from direct sun-light and weather until the concrete on superstructure is cast.

(x) The bearings shall be fixed in position, with epoxy resin adhesive of approved quality.

(xi) The concreting of superstructure shall be taked up only after ensuring that the adhesive for fixing the bearings or pier/abutment cap has set.

10. Unit rate shall be cubical contents of the bearing measured in cms.

11. The rate for each type of bearings shall include the cost of supplying and fixing the bearings in position complete. The rate shall also include the cost of samples and their testing as desired by the Engineer -in-charge. The rate shall also include the cost of adhesives for fixing them.

Item - 30 Providing pre-moulded asphalt filter joint.

1. Open joints shall be constructed at the loations as directed by the Engineer-in-charge using a wood strip, metal plate, other suitable material which is subsequently removed. When removing the material, care shall be exercised to avoid chipping or breaking the corners of the concrete. The edge of the concrete at the joints shall be edge finished. Reinforcement shall not extend across as open joint.

2. When performed filler is to be provided the filler shall be placed in correct position before concrete is placed against the filler. The filler material shall form part of the joint and while concreting the slab, care shall be taken to prevent the former from bring displaced. After the work is completed, the exposed face of the joint shall be cleaned of all loose material sticking to it.

3. The material used for filling expansion joint shall be bitumen impregnated felt which shall conform to the requirements of IS : 1838, and shall be got approved from the Engineer-in-charge.

The joint shall consist of large pieces and assembly of small pieces to make up the required size shall be avoided.

4. The expansion joint shall be measured in running metres. Thickness of the expansion joint will be 20 to 25 mm. Width of the expansion joint shall be equal to full depth of the slab.

5. The rate shall include the cost of all materials, labour, equipments and other incidental charges for fixing the joints complete in all respect as per these specifications and as shown on the drawings.

Item 31-Providing metal expansion joints.

1. Expansion joint shall be constructed according to the details shown on the drawings. The position of all bolts cast and holes drilled in plates shall be accurately determined from templates.

2. Steel plates, angles, or other structural sections provided in the expansion joints shall conform to the relevant IS specification and shall be accurately shaped to the section of concrete deck and shall be hot-dip galvanised after fabrication. Positive methods shall be employed in placing the assemblies, to keep them in correct position during the placing of concrete. Care shall be taken to avoid impairment of the clearance in any manner. The material used for filling expansion joint shall be bitumen impregnated felt, elastomeric or any other suitable material as specified on the drawings. Impregnated felt shall conform to the requirement of IS : 1838 & shall be got approved from the Engineer-in-charge. The joint filler shall consist of large pieces and Assembly of small pieces to make up the required size shall be avoided.

3. The expansion joints shall be measured in running metres.

4. The rate shall include the cost of all material, labour, equipment and other incidental charges for fixing the joints complete in all respects as shown on the drawings.

Item 32- Load test of super-structure

1. The Engineer-in-charge shall instruct that a load test be made on any part of the super structure if in his opinion such a test is deemed necessary for one or more of reasons specified below: -

(a) The work test cubes failing to attain the specified strength.

(b) The shuttering being prematurely removed.

(c) Over loading during construction of the structure or part thereof.

(d) Concrete improperly cured.

(e) Any other circumstances attributable to negligence on the part of the contractor which, in the opinion of the Engineer-in-charge, results in the reduction of required strength of the structure or part thereof.

(f) Any reason other than the foregoing.

2. If the load test be ordered to be made solely or in part for the reasons (a) to (e) the test shall be carried out at the contractor's own cost. If the test is required to be carried out for the reasons specified at (f) hereinbefore, the contractor shall make the test and shall be paid for the same.

3. The test load shall not be applied earlier than 28 days of the completion of placing of the concrete in the part of the structure to be tested and the latter shall not be supported during the test by the shuttering or other non-permanent support. Necessary care shall, however, be taken to ensure that in the event of failure under the test temporary support of the loaded member shall be immediately available.

4. If the result of the load test (or the reasons mentioned at (a) to (e) is not satisfactory in the opinion of the Engineer-in-charge he shall instruct that the part of the structure concerned shall be taken down or cut out and reconstructed to his satisfaction or that other remedial measures shall be taken to make the structure secure and strong as per requirement at the contractor's own risk and cost or the work may be accepted as sub-standard work and paid at reduced rate as may be decided by the Engineer-in-charge and his decision in the matter shall be binding, on the contractor. The contractor shall provide necessary materials, instruments, equipments observations platforms, plant and labour needed for carrying out the test as required. The load in general shall be in the form of sand bags. However, the contractor may apply the test load in any other suitable manner as may be approved by the Engineer-in-charge. The contractor shall make all necessary arrangements for observation platforms, centering, taking deflection by deflectometers etc. to the entire satisfaction of the Engineer-in-charge. The test load shall be kept at least 24 hours or as directed before removal.

Test load of superstructure shall be 1.5. times the equivalent load including maximum stresses at sections of maximum bending moment and or shear force for which the superstructure is designed,

5. The item for the purpose of payment shall be measured per number of load test placed on the superstructure and the payment of the same made on completion of the test.

6. Unit rate shall include all materials, labour, measuring instruments, tools and plant necessary to carry out the load test.

Item 33-A-Providing R.C.C. parapet precast in controlled concrete.

1. For concrete and steel, specifications of the items of controlled concrete and reinforcement shall apply.

2. All components of the parapets shall be precast and arranged in the pattern as shown on the drawing, and shall be jointed together as per details shown on the drawing.

3. The parapet shall be truly and correctly aligned in line and level, along the centre line of the parapet over the top rail. All edges and corners shall be straight and finished in true line and level.

4. Parapet shall be measured in running metres. Reinforcement in the parapet shall not be paid separately,

5. Unit rate includes cost of all materials including steel, form work, labour, tools and plants to complete the job.

Item 33-B-Providing R.C.C. Parapet cast-in-situ in controlled concrete

1. For concrete and steel, specifications of the items of controlled concrete and reinforcement shall apply.

2. The parapet shall be truly and correctly aligned in line and level, along the centre line of the parapet over the top rail. All edge's and corners shall be straight and finished in true line and level. Forms shall either be of single width boards or shall be lined with suitable material duly approved by the Engineer-in-charge. Form joints in plain surface will not be permitted. All mouldings, panel work and level strips shall be constructed according to the details shown on the drawings.

3. Parapet shall be measured in running metres. Reinforcement in the parapet shall not be paid separately.

4. Unit rate includes cost of all materials including steel, form work, labour, tools and plants to complete the job.

Item 34- Providing post and pipe railing

1. G.I. Pipes shall be of light duty type. Concrete shall conform to relevant specifications of item of concrete of ordinary grade specified in the item. For structural steel relevant specifications of item of steel cutting edge and for mild steel, relevant specifications of item of M.S. reinforcement shall apply.

2. The pipe railing shall consist of R.C.C. posts of required dimensions as approved by the Engineer-in-charge or structural steel sections as shown on the drawings. The structural section shall be anchored to R.C.C. in the manner as directed by the Engineer-in-charge. Three rows of G.I. pipe, upper one of 50 mm. dia. and lower two of 40 mm. diameter shall be provided. Holes of required size shall be made in the posts and the pipe shall be fixed with necessary couplings and three coats of enamel paint shall be applied to iron work (first coat shall be of red lead) If R.C.C. posts are used, they shall be applied 2 coats of white wash. The posts shall be fixed at 2 m. to 2.5 m. centre to centre depending upon the span-length.

3. Railing shall be measured in running metres.

4. Unit rate includes cost of all materials, labour, tools and plant to complete the job.

Item 35-Providing Water spout of 100 mm. dia. Of-

- (A) Cast Iron
- (B) Galvanised Iron
- (C) P.V.C.

1. Material for the water spout shall be as mentioned in the item and shall be got approved from the Engineer-in-charge.

2. Water spout shall be 100 mm. internal dia. Cast iron grating shall be provided at the entry and shall be fixed in the recess so as to be flush with the road surface. The quality and size of The grating shall be got approved from the Engineer-in-charge. The water spouts shall project at least 10 cm. outside the concrete and shall be rigidly fixed in it. The grating and C.I. pipes shall be painted with two coats of anticorrosive black bitumen paint.

3. Measurement shall be per number of water spout fixed.

4. Unit rate includes cost of all materials, labour and tools to complete the work-

Item 36-Providing Marble Plate

1. Marble plate shall be white and of approved quality and shall be of size as mentioned in the item. Lettering shall be done by V-shape engraving and shall be filled with black paint of approved quality, letting shall be done as directed by the Engineer-in-charge. The Marble plate shall be fixed in neat cement at a place as directed by the Engineer-in-charge. Cement shall conform to relevant IS Specification.

2. Measurement shall be per number of marble plate fixed.

3. Unit rates includes cost of all material labour and tools to complete the work.

Item 37-Prestressed concrete work

1. Para 1 to 31 of the item of controlled concrete shall apply.

2. As an alternative to centering work and casting the girders in situ. The girders may be precast in a yard and launched into position using any approved method of launching with prior approval of the Engineer-in-charge satisfying all the requirements and supporting their proposals for launching with detailed design and drawings. All materials and equipment required for launching shall have to be designed and got approved from the Engineer-in-charge. The launching shall be the responsibility of the contractor and the approval by the Engineer-in-charge to the design and drawing of the launching system shall in no way relieve the contractor of the responsibility for its successful working. The contractor is expected to take all necessary precautions. The contractor shall be responsible for any damage or loss in the process of launching, side-shifting and any other operation, and the same shall be made good by him at his own cost. Sheaths shall be placed and aligned strictly as shown on the drawings and maintained securely to prevent displacement during placing the compaction of concrete.

3. Grout holes shall be left in concrete at such places and in such manner as directed by the Engineer-in-charge. Water shall be injected to clean the passage thoroughly before grouting and the ducts will be dried with compressed air. Regroutting shall be done to fill up the space formed as a result of the settlement of the grout.

4. If the girders are not cast or launched in position, the same shall be shifted sideways by a suitable device which shall be got approved from the Engineer-in-charge before placing them in position.

Item-38-Providing High Tensile steel wires including Prestressing.

1. All wires or bars shall be assigned a lot number and shall have suitable tags for identification. All samples shall be truly representative of the lot to be furnished and in the case of wire or strand, they shall be taken from the same master roll. All materials specified for testing shall be furnished as per instructions of Engineer-in-charge, free of use. When High Tensile steel wires are brought by the Contractor, he shall produce all relevant certificates from the manufacturers. Additional tests if required by the Engineer-in-charge, shall be got conducted by the Contractor at his cost, through an independent agency approved by the Engineer-in-charge.

2. Sheaths shall be manufactured from Bright Galvanized metal sheet or any other specified material. They shall be preferably machine made and of a large enough bore to allow easy threading of the cable or bar in long lengths. They shall be strong enough as not to be dented or deformed during handling or concreting.

3- Preferably proprietary forms of anchorages shall be used and they shall be strictly in accordance with the manufacturer's instructions. If the Engineer-in-charge so desires, few anchorage cones shall be got tested by the Contractor at his own cost. The anchorage shall be furnished, complete with distribution plates of each size of type to be used, free of charge, for testing.

4. Cement for grouting shall conform to relevant specifications but rapid hardening Portland cement may be used at temperatures less than 7.2°C. Sand, where used for large ducts, shall be of a size smaller than 2 mm. additives (Plasticizers) shall be used only when experience has shown that their use improves the quality of the grout. They shall contain no chloride or nitrate or any other ingredient which may induce corrosion of steel. The compressive strength of the grout at 7 days measured on 100 mm. cubes, shall be at least 175 kg/sq.cm. The test cubes shall be cured in a moist atmosphere for 24 hours and subsequently in water.

5. All prestressing steel shall be free from loose mill scale, rust, oil, grease or any other harmful matter at the time of its placing in the member. Cleaning of the steel may be carried out by immersion in suitable solvent solutions, wire brushing, or passing through a pressure box containing carborundum powder.

6. As far as possible prestressing wire shall be obtained from the manufactures in coils having diameter of not less than 350 times the diameter of the wire itself, so that the wire springs back straight on being uncoiled. If due to smaller of the coil or any other reason it does not happen the wire shall be straightened before use. Prestressing steel bars, may be obtained from the manufacturers in straight condition. Any small adjustments necessary because of site conditions shall be made by bending in a normal type bar bender. Bars shall not be bent when their temperature is less than 10%.

7. Prestressing steel shall be accurately located and maintained in position, both vertically and horizontally, as per drawings. The method of supporting and fixing shall be such that profile of cables is not at all disturbed by heavy and prolonged vibrations, by pressure of wet concrete, by workmen or by construction. The steel sheaths or duct formers shall be suitably tied to secondary reinforcement or to properly located withdrawably through shutter bolts, precast concrete blocks or similar effective means, in such a manner that they do not give rise to excessive friction when the steel being tensioned.

8. All cutting to length and trimming of ends shall be done by suitable mechanical or flame cutters, when a flame cutter is used, care shall be taken to ensure that the flame does not come in contact with other stressed steel. In post-tensioning ends of prestressing steel projecting beyond the anchorages shall be cut after the grout has set. Welding of prestressing steel shall not be permitted. Internal prestressing steel shall be protected by grouting as detailed in above. External prestressing steel shall be protected by encasing it in a dense concrete cover secured to the main concrete.

9. Sheaths shall be sufficiently water tight to prevent concrete laitance penetrating them in quantities likely to increase friction. Special care shall be taken to ensure water tightness at joints. Anchor cones, blocks and plates shall be positioned, and maintained during concreting so that the centre line of the duct passes axially through the anchorage assembly. All bearing surface of the anchorages shall be cleaned prior to concreting and tensioning. Adequate provision shall be made for protection of the anchorages against corrosion.

10- It shall be ensured that all necessary equipment for prestressing is available at site of work. The prestressing shall be carried out with approved jacking equipment. The tensioning apparatus shall satisfy the following requirements :

- (i) The means of attachments of the prestressing steel to the jack or any other tensioning apparatus shall be safe and secure.
- (ii) Where two more wires are stressed simultaneously, provision shall be made for equal stressing of the wires;

(iii) The tensioning apparatuses shall be such that it can apply controlled total force gradually on the concrete without inducing dangerous secondary stresses in steel anchorage or concrete;

(iv) Means shall be provided for direct measurement of the force in prestressing steel during stressing or gauges fitted in the hydraulic system itself to determine the pressure in the jacks. Facilities in such a case shall be provided for the measurement of the extension of prestressing steel and of any movement of the gripping devices at transfer.

Combination of the jack and the gauge shall be calibrated and a graph or table showing the calibration shall be furnished and got approved from the Engineer-in-charge prior to the commencement of work. Calibration of gauges of the jacks shall be done at suitable intervals, the prestressing equipment shall be checked to determine any variation from the normal values during use. So far as these variations depend upon external influence (e.g., temperature in the case of oil jacks) they shall be taken into account. Any equipment which gives an error in values of more than +5% shall not be used on the works.

11: All reasonable precautions shall be taken when working with or near steel which has been tensioned or is in the process of being tensioned. Person shall not stand in line with the steel; anchorages or the jacking equipment, neither shall they walk on the steel. Simple, protective measures such as stout timber shields armoured with steel shall be placed in line with prestressing steel and behind the jacks so as to protect personnel crossing in the course of their duties. In all cases, cable extension and the prestressing force to be applied shall be worked out in advance after allowing for all the factors like (i) tensioning in stages; (ii) hindrance to elongation on account of friction due to non-rectilinear alignment of the prestressing elements; (iii) slip in the anchorages; and (vi) creep; and an approved record of the same shall be kept. The change in length of the cables as well as the tensioning force shall be measured at the time of tensioning and it shall be proved by comparison that the losses allowed for are not exceeded. Tensioning shall be carried out under competent supervision in such a manner that the stress in the steel increases at a gradual and steady rate. When stressing from one end only, the pull at the end remote from the jack shall be accurately measured and an appropriate allowance made in the measured extension at the jacking end. No tensioning of bars shall be carried out when the temperature is less than 2 °C.

12. Where wires in a cable are not stressed simultaneously spacing members shall be sufficiently rigid so as not to be displaced during the successive tensioning operations. Wires and cables, shall be so arranged that they do not pass round sharp corners or bends to avoid setting up of stresses likely to provide rupture. Tensioning shall be conducted in such a manner that the applied tension and elongation can be measured at all times. It shall be ensured that in no case the load is applied to the concrete before it attains the specified strength. To determine the specified strength additional cube test shall be conducted at contractor's cost. After the steel has been anchored, the force exerted by the tensioning apparatus shall be decreased gradually and steadily so as to avoid shock to the prestressing steel or anchorage.

13 Vents shall be provided at all crests and valleys in the-duct profile and at intervals of not more than 15 metres in straight reaches. Threaded entries shall be provided at the duct ends to permit use of a screwed connector from the grout pump. Before grouting, the ducts shall be thoroughly cleaned and shall be free of water, any dirt or other foreign substances. Ducts formed without-metal sheathing shall be flushed with water before grouting, and all surplus, water removed by compressed air injection. The anchorages shall be thoroughly sealed with mortar of strength equal to that of the grout to prevent ingress of air into the duct during grouting operation. The equipment shall be capable of producing a grout of colloidal consistency, by means of high frequency turbulence but imparting only a slow motion to the body of the grout. It shall have delivery pressure of upto 7 Kg/cm² and be capable of continuous operation without any appreciable pressure variation and include a system for recirculating the grout while actual grouting is not in progress. The piping shall have a minimum of bends, valves and changes in diameter, the baffle shall be fitted with sieve strainers 2 mm in size. The equipment and in particular the piping, shall be thoroughly washed with clean water after every operation and more frequently if necessary. Water shall be added to the mixer first and then the cement. After these have been thoroughly mixed, sand and the additive, if any, shall be added. The water content of the mix shall be kept as low as possible and the water/cement ratio of 0.40 will be preferable when using a neat cement grout. The approximate proportion of the mix shall be one part cement to 0.74 part sand, the exact proportion being adjusted to form a grout giving proper consistency. Mixing shall continue for at least 2 minutes until a uniform consistency is obtained. Injection shall be continuous.

Grout shall be allowed to flow from vent openings until its consistency at exit is equivalent to that of the grout injected. The vent opening shall thereafter be firmly closed one after another in the direction of flow. Sufficient pressure shall be used to force the grout completely through the duct, care being taken not to repute the ducts. Grouting shall be carried out as soon as practicable after the steel has been stressed. The injection tubes shall be topped up with cement grout if any wastage or subsidence of grout occurs when the pump is disconnected. When grouting is done at temperature below 7 °C, provision shall be made for thoroughly protecting the concrete member against frost. Grouting is not recommended in very cold weather.

14. To provide for any deficiency in the prestressing free, sand- bye cables shall be provided in the girders and the same shall not be paid for even if they are used in the girder. Stand bye cable will be permitted to be withdrawn if not required to be stressed.

15. For the purpose of measurement, the length of the high tensile steel shall be measured as actually used in the finished work. From the length so measured its weight shall be calculated in tonnes on the basis of which tensile steel is supplied to the Contractor by the Department or as per IS : 1732 If steel is arranged by the Contractor. Anchorage devices, ducts or metal sheath shall be deemed to be included in the item of high tensile steel and shall not be measured separately.

16. The item rate for high tensile steel cover the cost of all materials, labour, tools and paint required for fixing, placing, tensioning, anchoring, and grouting the high tensile steel in the prestressed cement concrete as shown on the drawings. The cost of anchoring devices and ducts or metal sheath shall also be included in this rate.

Item-39 Cement pointing in Cement Mortar.

1. For a surface which is to be subsequently pointed, the joints shall be squarely raked out to a depth of 15 mm, while the mortar is still green. The raked joints shall be well brushed to remove dust and loose particles and the surface shall be thoroughly washed with water, cleaned and wetted.

2. Cement and sand shall be mixed in proportions 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.

3. The mixing shall be done intimately by hand-mixing, on a clean wastertight platform. Cement and sand shall be first mixed dry in the required proportion to obtain a 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 stiffened because of evaporation of water the same shall be re-tempered by adding water as frequently as needed to restore to requisite consistency but this retempering shall be permitted only within thirty minutes from the time of addition of water at the time of initial mixing.

4. For pointing, the mortar shall be filled and pressed into the raked out joints before giving the required finished- The pointing shall then be proper type given on the drawings. If type of pointing is not mentioned on the drawing the same shall be ruled pointing. For ruled pointing after the mortar has been filled and pressed into the joints and finished off level with the edges, it shall while still green be ruled along the centre with a half round tool of such width as may be specified by the Engineer-in-charge. The superfluous mortar shall then be cut off from the edgework of the lines and the surface of the masonry shall also be cleaned off all mortar.

5. Curing shall be started as soon as the mortar used for finishing has hardened sufficiently not 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.

6. Stage scaffolding shall be approved for the work. This shall be independent of the structure.

7. The work of pointing shall be measured in square metres of the surface treated.

8. The rate for pointing shall include erecting and removal of scaffolding all labour, materials and equipment incidental to complete the pointing, raking out joints, cleaning, wetting filling with mortar, trowelling, pointing and watering .

Item-40 Provide in and placing precast R.C.C. footpath slab in controlled concrete.

1. The relevant specifications of controlled cement shall apply for the precast R.C.C. slabs. The footpath slab shall be precast and shall be grade and thickness as per item. The relevant specifications for reinforcement shall apply for the reinforcement in the slab. The chequered tiles shall be of the quality and make as approved by the Engineer-in-charge. The thickness of chequered tiles be 25 mm. The R.C.C. slabs and chequered tiles shall be laid in C.M. 1:5 as directed by the Engineer-in-charge. Specification of mortar as given in the item of cement pointing shall apply.

2. The measurements for payment shall be on Sq. Mt. basis.

3. The item includes cost of materials including necessary reinforcement, providing and fixing of chequered tiles on the slab, labour, plant, from work including fixing the R.C.C. slabs and chequered tiles in position.

required operations including full compensation for all components listed in Clause 401.7 (i) to (v).

404 WATER BOUND MACADAM SUB-BASE/BASE

404.1 Scope

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.

404.2 Materials

404.2.1 Coarse Aggregates

Coarse aggregates shall be either crushed or broken stone, crushed slag, overburnt (Jhama) brick aggregates or any other naturally occurring aggregates such as kankar and laterite of suitable quality. Materials other than crushed or broken stone and crushed slag shall be used in sub-base courses only. If crushed gravel /shingle is used, not less than 90 percent 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 400-8. 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 percent, the soundness test shall be carried out on the material delivered to site as per IS:2386 (Part 5).

Table 400-8 : Physical Requirements of Coarse Aggregates for Water Bound Macadam for Sub-base/Base Courses

| S.No. | Test | Test Method | Requirements |
|--------|--|----------------------------------|------------------|
| 1) *** | Los Angeles Abrasion value | IS: 2386(Part 4) | 40 percent (Max) |
| | or Aggregate Impact value | IS: 2386 (Part-4) or IS:5640* | 30 percent (Max) |
| 2) | Combined Flakiness and Elongation Indices (Total) ** | IS:2386 (Part-1) | 35 percent (Max) |

* Aggregates 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.
- *** In case water bound macadam is used for sub-base, the requirements in respect of Los Angeles Value and Aggregate Impact Value shall be relaxed to 50 percent and 40 percent maximum respectively.

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.

404.2.3 Crushed Slag

Crushed slag shall be made from air-cooled blast furnace slag. It shall be of angular shape, reasonably uniform in quality and density and generally free from thin, elongated and soft pieces, dirt or other deleterious materials. The weight of crushed slag shall not be less than 11.2 kN per m³ and the percentage of glossy material shall not be more than 20. It should also comply with the following requirements:

- | | | | |
|------|--------------------|---|--|
| i) | Chemical stability | : | To comply with requirements of appendix of BS:1047 |
| ii) | Sulphur content | : | Maximum 2 percent |
| iii) | Water absorption | : | Maximum 10 percent |

404.2.4 Overburnt (Jhama) Brick Aggregates

Jhama brick aggregates shall be made from overburnt bricks or brick bats and be free from dust and other objectionable and deleterious materials. This shall be used only for road stretch when traffic is low.

404.2.5 Grading Requirement of Coarse Aggregates

The coarse aggregates shall conform to one of the Gradings given in Table 400-9 as specified.

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 percent.

Table 400-9 : Grading Requirements of Coarse Aggregates

| Grading No. | Size Range | IS Sieve Designation | Percent by weight Passing |
|-------------|------------------|----------------------|---------------------------|
| 1) | 63 mm to 45 mm | 75 mm | 100 |
| | | 63 mm | 90 – 100 |
| | | 53 mm | 25 – 75 |
| | | 45 mm | 0 – 15 |
| | | 22.4 mm | 0 – 5 |
| 2) | 53 mm to 22.4 mm | 63 mm | 100 |
| | | 53 mm | 95 – 100 |
| | | 45 mm | 65 – 90 |
| | | 22.4 mm | 0 – 10 |
| | | 11.2 mm | 0 – 5 |

Note : The compacted thickness for a layer shall be 75 mm.

Screenings shall conform to the grading set forth in Table 400-10. The quantity of screenings required for various grades of stone aggregates are given in Table 400-11. The Table also gives the quantities of materials (loose) required for 10 m² for sub-base/base compacted thickness of 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.

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 m³ per 10 m².

Table 400-10 : Grading For Screenings

| Grading Classification | Size of Screenings | IS Sieve Designation | Percent by Weight Passing the Sieve |
|------------------------|--------------------|----------------------|-------------------------------------|
| A | 13.2 mm | 13.2 mm | 100 |
| | | 11.2 mm | 95 - 100 |
| | | 5.6 mm | 15 - 35 |
| | | 180 micron | 0 - 10 |
| B | 11.2 mm | 11.2 mm | 100 |
| | | 9.5 mm | 80 - 100 |
| | | 5.6 mm | 50 - 70 |
| | | 180 micron | 5 - 25 |

Table 400-11 : Approximate Quantities of Coarse Aggregates and Screenings Required for 75 mm Compacted Thickness of Water Bound Macadam (WBM) Sub-Base/Base Course for 10 m² Area

| Classification | Size Range | Compacted Thickness | Loose Qty. | Screenings | | | |
|----------------|------------------|---------------------|-----------------------------|-------------------------------|--|---|-----------------------------|
| | | | | Stone Screening | | Crushable Type Such as Moorum or Gravel | |
| | | | | Grading Classification & Size | For WBM Sub-base/ Base Course (Loose Quantity) | Grading Classification & Size | Loose Qty. |
| Grading 1 | 63 mm to 45 mm | 75 mm | 0.91 to 1.07 m ³ | Type A 13.2 mm | 0.12 to 0.15 m ³ | Not uniform | 0.22 to 0.24 m ³ |
| -do- | -do- | -do- | -do- | Type B 11.2 mm | 0.20 to 0.22 m ³ | -do- | -do- |
| Grading 2 | 53 mm to 22.4 mm | 75 mm | -do- | -do- | 0.18 to 0.21 m ³ | -do- | -do- |

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.

boats) and labour for loading, unloading and laying within the time frame for construction of guide bund. Adequate reserve of stones should be maintained for major works as decided by the Engineer. Reserve stones shall be stacked away from the main channel of the river.

2502.6 Where the alignment of guide bund or the approach embankment crosses branch channel of the river, the branch channel shall be either diverted to the main channel of the river with the help of spurs, etc. or closed by a properly designed closing dyke or closure bund, before taking up construction of guide bund.

2503 APRON

2503.1 General

This work shall consist of laying boulders directly or in wire crates on the bed of rivers for protection against scour.

The stones used in apron shall be sound, hard, durable and fairly regular in shape. Stones subject to marked deterioration by water or weather shall not be used.

Quarry stones having angular shapes shall be preferred to round boulders.

Where the stones of required size are not economically available, cement concrete blocks in minimum M15 grade conforming to Section 1700 of these Specifications or stones in wire crates shall be used.

2503.2 Boulder Apron

The size of stone shall conform to Clause 5.3.7.2 of IRC: 89.

The size of stone shall be as large as possible and no stone shall weigh less than 40 kg. The specific gravity of stones shall be as high as possible and not less than 2.4.

To ensure regular and orderly disposition of the full intended quantity of stone in the apron, template cross walls in dry masonry shall be built about a metre thick and to the full height of the specified thickness of the apron, at intervals of 30 metres all along the length and width of the apron. Within these walls, the stone shall be hand packed.

The surface on which the apron is to be laid shall be levelled and prepared for the length and width, as shown on the drawings. In case the surface is below the low water level, the ground level may be raised upto low water level by dumping earth and the apron laid thereon. In such cases, the quantity of stone required in apron shall be re-worked by taking the toe of pitching at higher level.

2503.3 Wire Crates and Mattresses for Apron

Wire Crates and Mattresses shall be any of two types mechanically woven and hand woven.

2503.3.1 Mechanically Woven Crates (Gabions and Mattresses)**2503.3.1.1 Description**

Mechanically woven wire crates shall be made of hot dipped galvanized mild steel wire of diameter not less than 2.2 mm having minimum tensile strength 350 MPa conforming to IS:280. The galvanisation shall be heavy coating for soft condition conforming to IS:4826. For corrosive environment, an additional PVC coating of 0.5 mm thickness shall be provided over the galvanisation, or zinc alloy coating as per EN 10244-2 shall be provided in place of galvanisation. The mesh of the crate shall be of type 10 x 12, 8 x 10, and 6 x 8 as per EN 10223. Mesh shall be given double twist at each intersection and shall be mechanically selvaged all along the edges of the boxes. Wire crates standard sizes shall be as per ASTM A975. The wire crates shall be divided into compartments by diaphragms placed at 1 m centre to centre.

2503.3.1.2 Mesh and Box Characteristics

Mesh types and shapes shall be as given in Table 2500-1. The mesh and box characteristics of gabions and mattresses shall be as per Tables 2500-2 and 2500-3 respectively.

Table 2500-1 : Mesh Types and Sizes

| Mesh Type | 'D' Nominal Size, mm | Tolerances |
|-----------|----------------------|---------------|
| 10 x 12 | 100 | + 16% to - 4% |
| 8 x 10 | 80 | |
| 6 x 8 | 60 | |

Table 2500-2 : Mesh & Box Characteristics for Gabions

| Mesh Type | 10 x 12 | | | 8 x 10 | | |
|--|---|------|----------------------------------|------------------|------|----------------------------------|
| 'D', mm | 100 | | | 80 | | |
| Wire Type | Only Zinc Coated | | Zinc + PVC Coated | Only Zinc Coated | | Zinc + PVC Coated |
| Mesh Wire Dia, mm | 2.70 | 3.00 | 2.70/3.70* | 2.70 | 3.00 | 2.70/3.70* |
| Edge/Selvage wire Dia, mm | 3.40 | 3.90 | 3.40/4.40* | 3.40 | 3.90 | 3.40/4.40* |
| Lacing wire dia, mm | 2.20 | 2.20 | 2.20/3.20* | 2.20 | 2.20 | 2.20/3.20* |
| PVC coating thickness, mm | N. A | | Nominal – 0.50 Minimum – 0.38 | N. A | | Nominal – 0.50 Minimum – 0.38 |
| Typical Sizes Length x Width x Height (m)/ Number of diaphragms | 4 x 1 x 1 / 3 Nos, 3 x 1 x 1 / 2 Nos, 2 x 1 x 1 / 1 No, 1.5 x 1 x 1 / 0 No, 2 x 1 x 0.5 / 1 No , 3 x 1 x 0.5 / 2 Nos, 4 x 1 x 0.5 / 3 Nos, 2 x 1 x 0.3 / 1 No, 3 x 1 x 0.3 / 2 Nos, 4 x 1 x 0.3 / 3 Nos | | | | | |
| Tolerances in Size of Gabion Boxes | Length & Width... +/- 5%: Height > 0.3m... +/- 5% and Height <= 0.3m... +/- 10% | | | | | |

* Internal Diameter/External diameter of PVC Coated Wire

Only standard sizes of Gabion boxes are indicated in the table above. Special sizes can also be ordered as agreed between the purchaser and manufacturer.

Table 2500-3 : Mesh & Box Characteristics for Revet Mattresses

| Mesh Type | 6 x 8 | |
|--|---|----------------------------------|
| 'D', mm | 60 | |
| Wire Type | Only Zinc Coated | Zinc + PVC Coated |
| Mesh Wire Dia, mm | 2.20 | 2.20/3.20* |
| Edge/Selvedge wire Dia, mm | 2.70 | 2.70/3.70* |
| Lacing wire dia, mm | 2.20 | 2.20/3.20* |
| PVC coating thickness, mm | N. A | Nominal – 0.50 Minimum – 0.38 |
| Typical Sizes Length x Width x Height (m)/Number of diaphragms | 4 x 2 x 0.17 / 3 Nos, 3 x 2 x 0.17 / 2 Nos, 2 x 2 x 0.17 / 1 No 4 x 2 x 0.23 / 3 Nos, 3 x 2 x 0.23 / 2 Nos, 2 x 2 x 0.23 / 1 No 4 x 2 x 0.30 / 3 Nos, 3 x 2 x 0.30 / 2 Nos, 2 x 2 x 0.30 / 1 No | |
| Tolerances in Size of Revet Mattresses | Length & Width ... +/- 5%; Height <= 0.3m ... +/- 10% | |

* Internal Diameter/External diameter of PVC coated wire

2503.3.1.3 Dimensions and Tolerances

The diameter of galvanized steel wire shall conform to the values as per Table 2500-2 for Gabions and Table 2500-3 for Revet mattresses. The diameter of the wires shall also conform to the tolerance limits plus and minus the values as shown in Table 2500-4.

Table 2500-4 : Permitted Tolerances on Galvanized Steel Wire Diameters

| Nominal Diameter of Galvanized Wire, mm | Permitted Tolerances (+/-) on Wire Diameters, mm |
|---|--|
| 2.00 | 0.05 |
| 2.20 | 0.06 |
| 2.40 | 0.06 |
| 2.70 | 0.07 |
| 3.00 | 0.08 |
| 3.40 | 0.09 |
| 3.90 | 0.10 |

Note :

- 1) The minimum and nominal thickness of PVC coating uniformly applied in a quality workmanlike manner shall be as shown in Tables 2500-2 and 2500-3.

- 2) Gabions shall be manufactured with a 10 x 12 or 8 x 10 mesh type (Fig. 2500-1) having a nominal mesh opening size as per Table 2500-2. Dimensions are measured at right angles to the center axis of the opening and parallel to the twist along the same axis.
- 3) Revet mattresses shall be manufactured with a 6 x 8 mesh type (Fig. 2500-1) having a nominal mesh opening size as per Table 2500-2. Dimensions are measured at right angles to the center axis of the opening and parallel to the twist along the same axis.
- 4) The width and length of the gabions and revet mattresses as manufactured shall not differ more than $\pm 5\%$ from the ordered size prior to filling. Typical gabion and revet mattress sizes are shown in Tables 2500-2 and 2500-3 respectively.
- 5) The height of the gabions and revet mattresses as manufactured shall not differ more than $\pm 10\%$ if the height is less than or equal to 0.3 m and shall not differ more than $\pm 5\%$ if the height is more than 0.3 m from the ordered size prior to filling.
- 6) Mesh Opening Tolerances – Tolerances on the hexagonal, double-twisted wire mesh opening shall not exceed $+16\%$ to -4% on the nominal dimension D values mentioned in Table 2500-1.

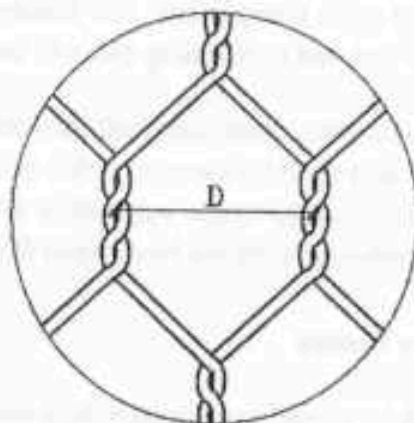


Fig. 2500-1 : Mesh Type & Nominal Size 'D'

2503.3.1.4 Terminology, mechanical properties, physical properties, number of tests and test methods related to mechanically woven wire crates shall be as per Appendix-2500/I.

2503.3.2 Hand Woven Wire Crates

Wire crates shall be made from hot dipped galvanized mild steel wire of diameter not less than 4 mm in annealed condition having tensile strength of 300 MPa-450 MPa conforming to IS:280. The galvanizing shall be heavy coating for soft condition conforming to IS:4826.

The mesh size of the crate shall not be more than 150 mm.

Wire crates for shallow or accessible situations shall be 3 m x 1.5 m x 1.25 m in size. Where these have to be deposited and there is a possibility of overturning, the crate shall be divided into 1.5 m compartments by cross netting.

For deep or inaccessible situations, wire crates can be made smaller subject to the approval of the Engineer.

Wire crates built in-situ, shall not be larger than 7.5 m x 3 m x 0.6 m, nor smaller than 2 m x 1 m x 0.3 m. Sides of large crates shall be securely stayed at intervals of not more than 1.50 m to prevent bulging.

The netting shall be made by fixing a row of spikes on a beam at a spacing equal to the mesh. The beam must be a little longer than the width of netting required. The wire is to be cut to lengths about three times the length of the net required. Each piece shall be bent at the middle around one of the spikes and the weaving commenced from the corner.

A double twist shall be given at each intersection. The twisting shall be carefully done by means of a strong iron bar, five and half turns being given to the bar at each splice.

The bottom and two ends of the crate or mattress shall be made at one time. The other two sides shall be made separately and shall be secured to the bottom and the ends by twisting adjacent wires together. The top shall be made separately and shall be fixed in the same manner as the sides after the crates or mattress have been filled.

2503.3.3 Laying of Wire Crates

Wherever possible, crates shall be placed in position before filling with boulders. Undulations in the bed shall be levelled prior to placement of wire crate units. The crates shall be filled by carefully hand-packing the boulders as tightly as possible and not by merely throwing in the stones or boulders.

Where the crates are to be laid on the sides and bed of the stream in underwater conditions, they shall be prefilled on dry area, lifted by cranes using suitable size frames with lifting slings at every 0.5 m to 1 m maximum spacing and placed at designated locations. Sacrificial steel rods of diameter 20 mm to 25 mm may also be used, in place of frame, by tying them to the edges and lifting directly with closely spaced slings. Once placed, divers shall lace the crates together at all contact surfaces. For sides of the banks a tilting platform, pantoon or barge can be used where mattresses are filled with stones on the level platform, resting at one end on the bank and has the other edge hinged to the pantoon/barge. One end of the filled wire crate is anchored to the dry edge of the slope and then the pantoon/barge is moved away

from the bank, thus lowering and sliding out the tilted platform under the crate, gradually placing the crate on the slopes while the tilted platform rotates around its hinges.

2504 PITCHING/REVTMENT ON SLOPES

2504.1 Description

The work shall consist of covering the river side slopes of guide bunds, training works and road embankments with stone, boulders, cement concrete blocks or stones in wire crates over a layer of granular material which will act as a filter. The rear slopes, not subjected to direct attack of the river, may be protected by 300 mm - 600 mm thick cover of clayey or silty earth and turfing.

2504.2 Pitching and Filter Medium

2504.2.1 Pitching

The pitching shall be provided with stones of thickness and shape as indicated on the drawings.

The stones shall be obtained from quarries and shall be sound, hard, durable and fairly regular in shape. Round boulders shall not be allowed. Stones showing marked deterioration by water or weather shall not be accepted.

The size and weight of stone shall conform to Clause 5.3.5.1 of IRC: 89. No stone, shall weigh less than 40 kg. The size of spalls shall be a minimum of 25 mm and shall be suitable to fill the voids in the pitching.

Where the stones of required size are not economically available, cement concrete blocks in minimum M15 grade concrete conforming to Section 1700 of these Specifications or stones in wire crates, shall be used.

Geosynthetics, if used in pitching, shall conform to Section 700 of these Specifications.

2504.2.2 Filter Medium

The material for the filter shall consist of coarse sand, gravel or stone. One or more layers of graded materials, to act as a filter medium, shall be provided underneath the pitching, to prevent loss of the embankment material and build up of uplift head on the pitching.

SCHEDULE FOR TESTING OF MATERIALS

For ensuring quality control and workmanship, various tests prescribed below for materials shall be taken at periodical intervals as stipulated below.

The materials shall be a got tested at Government Laboratory (R & B) or field Laboratory of GERI (R & B) for which 1% of the estimated amount put to Tender shall be recovered from the contractor from the R.A. bills and final bills at the testing charges shall be paid to the GERI by the Government. However if the charges increase over 1% no excess recovery shall be made form the contractor as per resolution of B & C Department dated 10th, May 1985 vide TNC/1085 (4) s.

| Item No. as per Schedule 'B' | Brief Description Materials to be Tested | Qty. of Materials | Prescription of test which shall be carried out | Frequency @ which test shall be carried out | Total Nos of test to be taken |
|------------------------------|--|-------------------|---|--|-------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| | Rubble | 347.66 | *Gradation test | 1 to 100 - cum. 1 test | as per norms |
| | | | *Impact Value | 100 to 500 - cum. 3 test | |
| | | Cum | *Flakiness Index of | 500 to 1500 - cum. 5 test | |
| | | | | 1500 to 5000 - cum. 7 test | |
| | Kapchi | 6616.47 | *Gradation test | 1 to 100 - cum. 1 test | as per norms |
| | | | *Impact Value | 100 to 500 - cum. 3 test | |
| | | Cum | *Flakiness Index of | 500 to 1500 - cum. 5 test | |
| | | | | 1500 to 5000 - cum. 7 test | |
| | Grit | 115.9 Cum | *Stripping Value | One test per work | as per norms |
| | stone dust | 0.0 Cum | *P.I. Value | One test per work | |
| | Supplying of Quarry spall | 0.0 Cum | *Silt Content | One test per work | |
| | Sand | 3479.3 Cum | *Gradation | One test per work | |
| | Asphalt | 0.000 | *Penetration Test | Tanker test In Geri Lab. Only | 0 |
| | | M.T. | as per I.S. 1203 | Up to 10 1 | |
| | | | | 11 to 20 2 | |
| | | | | 20 to 50 3 | |
| | | | | Above 50 one per Tanker | |
| | | | Ductility Test | As per I.S. 1208 | |
| | | | Specification Gravity test | As per I.S. 1202 | |
| | | | Softening point test | As per I.S. 1204 | |
| | | | Viscosity test | As per I.S. 1206 | |
| | | | Quality of binder test | 3 test per 2 tankers on plant site. | |
| | Cement | 2539.390 | *Consistency | 1 test @ 50.0 M.T. 100 T 2 tests, | 8 |
| | | M.T. | *Setting time | 200 T 3 tests, 300 T 4 tests, 500 T 5 tests, | |
| | | | *Compressive Strength. | 800 T 6 tests, 1300 T 7 tests & 8 testd for large consignment. | |
| | | | | | |

| Item No. as per Schedule 'B' | Brief Description Materials to be Tested | Qty. of Materials | Description of test which shall be carried out | Frequenc which test shall be carried out | Total Nos of test to be taken |
|------------------------------|--|-------------------|--|---|-------------------------------|
| | Steel | TMT | *Tensile, (TMT) Yield | As per Manual of Quality Control 1 test/40 tonnes / per category | 42 |
| | | 327.37 | *Elongation Size | | |
| | | HT Strands | Yield | 1 test/40 tonnes / per category | 0 |
| | | 0.00 | *Elongation Size | | |
| | C.C.Cube Test | | *Compressive Strength. | 1 to 5 cmt - 1 No | |
| | | | | 6 to 15 cmt - 2 No | |
| | M10 | 58.00 | | 16 to 20 cmt - 3 No | 35 |
| | M15 | 1572.29 | | 20 to 50 cmt - 4 No | 28 |
| | M20 | 1233.20 | | 51 to above - 4 +1 additional sample for each 50 cu.mt. Or part there of. | 76 |
| | M25 | 3621.61 | | | 16 |
| | M30 | 620.33 | | | |
| | M35 | | | | |
| | M40 | | | | |
| | M45 | | | | |
| | M50 | | | | |

The contractor shall have to pay 1% of the estimate cost put to tender towards all testing of materials & the same shall be deducted from their bills for the work. The testing of various materials Testing charges of GERI shall be born by Govt. No refund be made not extra charges over 1% shall be recoverable from the contractor.

Signature of Contractor

Deputy Executive Engineer
(R & B) (P) Sub Division
Morbi

Executive Engineer
(R & B) (P) Division
Morbi

SECTION - 6
FORM OF BID

FORM OF BID

Description of the Works:

BID

To :

Address :

1. We offer to execute the Works described above and remedy any defects therein in conformity with the conditions of Contract, specification, drawings, Bill of Quantities and Addenda for the sum (s) of

(-----)

2. We undertake, if our Bid is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Engineer's notice to commence, and to complete the whole of the Works in the Contract within the time stated in the document.
3. We agree to abide by this Bid for the period of 120 Days from the date fixed for receiving the same, and it shall remain binding upon it and may be accepted at any time before the expiration of that period.
4. Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
5. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this ----- day of ----- 20

Signature ----- in the capacity of -----

----- duly authorized to sign bids for and on behalf of -----

(in block capitals or typed)

Address

Witness

Address

Occupation

SECTION - 7
BILL OF QUANTITIES

BILL OF QUANTITIES

Preamble

1. The bill of Quantities shall be read in conjunction with the Instructions to Bidder, Conditions of Contract, Technical Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, layout, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract.
4. The rates and prices shall be quoted entirely in Indian Currency.
5. A rate or prices shall be entered against each item in the Bill Quantities, whether quantities are stated or not. The cost of Items against which Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities (in case of Item rate contract).
6. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no Items are provided the cost shall be deemed to be distributed among the rates and prices entered for the related items of Work.
7. General direction and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the contract documentation shall be made before entering rates or prices against each item in the Bill of Quantities.
8. The method of completed work of payment shall be in accordance with the specification for Road and Bridge works. For building works specifications for building are to be followed.
9. Errors will be corrected by the Employer for any arithmetic errors pursuant to **Clause 29** of the Instructions to Bidder.
10. Rock is defined as all materials which, in the opinion of the Engineer, required blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for its removal, and which cannot be extracted by ripping with a tractor of at least 150 kw with a single rear mounted heavy duty ripper.

BILL OF QUANTITIES**(A) Percentage Rate Tender (Up to INR 50 Cr.)**

| Item No | Description of Item (with brief specification and reference to book of specifications) | Quantity | Unit | Rate In figures | Amount |
|------------------------------|--|----------|------|-----------------|--------|
| As Per Attached sheet | | | | | |

I/We am/are willing to carry out the work at... ..% above/below percent(Should be written in figures and words) of the estimated rate mentioned above. Amount of my /our tender works out as under.

Estimated amount put to tender

Estimated amount put to tender

Deduct.....% below

Add.....% Above

Net

Net

In words

In words

- 1 The Contractor shall exhibit a board with detailed specification and details of work as directed by the Engineer-In-Charge for which no extra payment shall be made.
- 2 The labour cess will be deducted as per prevailing rules i.e. 1% of the work done.
- 3 GST and Income tax TDS will be deducted at a source while making payments of bills
- 4 In all R.C.C. Items in Rate Analysis Standard Cement Consumption has been taken as per Govt. G.R.: PRC-10/2017 Cement Consumption/16/C Date:11/05/2017 as stated in S.O.R. therefore in R.C.C. Items where there is a change as per actual mix design the cost of difference of cement consumption have been deducted from the rate of original item at the rate of input rate mentioned in all the tender.

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

**SCHEDULE – B
QUANTITY STATEMENT**

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|---|----------------|------|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | 681.2 | Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift. (I) R.C.C. work | 1062.35 | Cum | 723,721.04 |
| 2 | 5215.9 | Excavation for foundation in sand, gravel, clay soft soils and murrum etc. including shoring, strutting dewatering as necessary and disposing of the excavated stuff as directed. (A) Depth upto 3.0 M. and lead upto 100m for 10 Cum | 511.11 | Cum | 2,665,909.90 |
| 3 | 788.7 | Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-15) | 3764.33 | Cum | 2,968,910.80 |
| 4 | 369.6 | Providing and laying plain cement concrete grade M-15 PCC Toe wall for toe protection i.e. to prevent the slope pitching from sliding down, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification. | 3772.18 | Cum | 1,394,189.79 |
| 5 | 309.6 | Providing and fixing in position (Thermo mechanically Treated bars) TMT Fe550D CRS conforming to IS 1786 reinforcing bars of various diameters for Box structure, retaining wall, etc. as per detailed designs and drawings and schedule including cutting, bending, hooking the bars, binding with 18 SWG GI wires with cost of all labour, materials, tools, plants, equipments, supporting as required with all lifts and leads etc. all complete as per specification and as directed by Engineer The rate includes for supply, loading, unloading, transporting to site, cutting, bending, lap length, hooking, placing, tying in position with contractor's own binding wire, welding, forming the cage and lowering it in position in pile bore etc. Welding and supporting in position to ensure lines and levels during concreting, maintaining proper cover/ spacing, all leads & lifts, etc. including contractor's own equipment, labour, supervisor, taxes, machineries, etc. complete as per drawings and specification. | 77471.35 | MT | 23,981,484.13 |
| 6 | 3394.2 | Providing and casting in situ controlled cement concrete M-25 for R.C.C. box structure, as per drawings, Stem of Retaining wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification. The rate is inclusive of all materials, including necessary mixing in fully automatic batch mix plant, transport, curing, vibrating, placing in position, scaffolding, staging, normal shuttering, formworks, deshuttering carefully, making good the damages, fixing embedment, inserts, pockets, wherever necessary, with all lead and lift with contractor's labour, tools & plants, machineries, as required, with including cost of fair finish form work. | 5304.31 | Cum | 18,004,043.51 |
| 7 | 900.9 | Providing and laying - Filter Media 600mm thick directed at the back of abutments, returns and wing walls as per detailed specifications. | 1233.39 | Sqm | 1,111,168.30 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|--|----------------|----------|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 8 | 918.0 | Providing & laying weep hole in Abutments, and returns by using A.C. pipe of 100mm including laying in proper grade and jointing the completed as per detailed specification. | 119.08 | Nos. | 109,317.07 |
| 9 | 2183.6 | Back filling behind Abutment, wing wall and return wall with selected granular material of approved quality including all the materials, compacting, labour, equipment charges, etc. all complete as per drawing and Technical Specification Section 300 (Percentage of fine content maximum 15%, Backfill soil phi 30°, Density 20 kN/m ³ , Field compaction 95 ± 2% modified proctor density. | 504.42 | Cum | 1,101,467.75 |
| 10 | 646.9 | Providing and laying rubble for apron (each stone weighting not less than 40Kg.) including and packing and filling in the interestices with quarry-spalls. For Rigid Apron. | 1083.81 | Cum | 701,164.89 |
| 11 | 789.1 | Providing and laying plain cement concrete grade M-20 curtain wall with minimum depth below floor level of 2m on upstream and 2.5m on downstream side as per clause 20.1.2.3 of IRC:SP-13:2004 and section 2507.1 of MORTH specification. | 4591.53 | Cum | 3,623,383.04 |
| 12 | 694.4 | Providing and laying rubble for apron (each stone weighting not less than 40Kg.) including and packing and filling in the interestices with quarry-spalls. For Flexible Apron. | 1083.81 | Cum | 752,604.99 |
| 13 | 194.1 | Providing and laying Filter material underneath pitching in slopes 300mm thick complete as per drawing and Technical specification. | 309.84 | Sqm | 60,127.26 |
| 14 | 58.2 | Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications. | 1136.59 | Cum | 66,170.37 |
| 15 | 98.4 | Providing and casting in situ controlled cement concrete M-25 for Parapet Wall, as per drawings. Stem of Parapet wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification. | 5304.31 | Cum | 521,816.59 |
| 16 | 227.9 | Providing and casting in situ controlled cement concrete M-30 for average 75 mm thick wearing coat laid as directed including tamping, vibrating, finishing, curing and filling in joints with bitumen complete | 5536.10 | Cum | 1,261,864.69 |
| 17 | 0.4 | Clearing and grubbing road land including uprooting rank vegetation grass bushes, shrubs, sapling and trees girth up to 300 mm removal of stumps of trees cut earlier and disposal of unserviceable materials (C) By mechanical means in area of light jungle | 28434.97 | Hect are | 10,520.94 |
| 18 | 90.2 | Dismantaling of Bituminous Layer | 256.75 | cum | 23,146.01 |
| 19 | 518.4 | Dismantaling of Granular Layer | 357.25 | cum | 185,194.83 |
| 20 | 5826.0 | Earthwork for embankment including breaking clods, dressing with all lead and lift and including watering rolling and consolidation of subgrade in layers at O.M.C. to required dry density including filling the depression which occur during the process using power roller 8T to 10T.(E) From Borrow area within 3.0KM lead. | 236.97 | Cum | 1,380,582.06 |
| 21 | 1222.0 | Construction of sub-grade and earthen shoulders using quarry spall with all lead and lift and including watering and rolling and consolidation of sub grade in layers at OMC to required dry density including filling the depressions which occur during the process using power roller 8T to 10 T | 289.78 | cum | 354,117.19 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|--|----------------|------|--|
| 1 | 2 | 3 | 4 | 6 | 7 |
| 22 | 155.3 | Construction of granular Sub base with Coarse Graded Material (Grade II) (Table:- 400- 2) of 200 mm by providing coarse graded material Metal Crushed using size 53mm to 26.5 mm@ 27.5%, 26.5 mm to 9.5 mm @ 22.5%, 9.5mm to 4.75mm @12.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting BT road by milling machine using motor grader on prepared surface mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1 grade-V. | 1111.11 | cum | 172,578.18 |
| 23 | 281.5 | Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.-Grading 1, Using Screening Crushable type such as Moorum or Gravel. | 1620.00 | Cum | 456,061.11 |
| 24 | 384.0 | Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing) | 5543.87 | Cum | 2,128,845.00 |
| 25 | 10.0 | Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP (Aluminum composite Panel); size 90x30 cms. rectangular as per design of IRC-67-2012. Pre treated with phospheting process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorisised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 1.8mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting. | 3666.30 | Nos. | 36,663.00 |
| 26 | 190.0 | Supplying and fixing reinforced concrete heavy duty non-pressure pipes with collars for culverts carrying heavy traffic as per IS 458-1991 specifications including setting the pipes in C.M. 1:2 watering and laying (to level or slopes) of class NP3 of following internal daimeters.(v) 900mm dia. | 3469.26 | Rmt | 659,159.40 |
| 27 | 2520.9 | Excavation for foundation in hard murrum and boulders and very stiff or sticky, clays and other similar strata including shoring and strutting and dewatering as necessary and disposing of the excavated stuff as directed . | 611.32 | Cum | 1,541,067.35 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|--|----------------|------|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 28 | 227.6 | Providing and laying plain cement concrete grade M-20 PCC protection wall, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification. | 4142.22 | Cum | 942,562.64 |
| 29 | 2.0 | Providing MS Flood guage on top of the bridge including supply, fixing and painting complete as directed by engineer in charge | 1877.54 | Nos. | 3,755.07 |
| 30 | 341.9 | Excavation in large boulders and soft rock by welding including shoring, strutting and dewatering as necessary and disposing of the excavated stuff as directed. | 716.55 | Cum | 244,968.52 |
| 31 | 58.0 | Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-10) | 3345.58 | Cum | 194,043.91 |
| 32 | 4.0 | Diversion sign board :-Providing & Fixing sign boards made out of 2mm aluminium sheet, size 180 x 60 cms. rectangle as per the attached drawing pre treated with phospheting process & acid etching. coated with one coat of epoxy priemr and two coats of best quality epoxy paint reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; Letters and numerals should be as per IRC-30-1968,3.1m long (2nos) stand post and frame fabricated from iron angle of 35x35x3mm, 50x50x5mm painted with best quality epoxy coatings in blak and white bends. The fixing at site shall be in 1:2:4 CC block of size 45 x 45x 60cms for each leg, including excavation curing etc. complete under the supervision of engineer in charge.(A) Engineer Grade(VR) | 6798.92 | Nos. | 27,195.68 |
| 33 | 26.7 | Granular sub base Grade 1 with black trap crushed stone well graded material (Table-400.1) by mix in place method construction of granular sub base by providing black trap crushed stone well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete. (As per technical specification clause-401) for Gr-1 Material | 1116.04 | Cum | 29,820.55 |
| 34 | 100.5 | Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.-Grading 2, Using Screening Crushable type such as Moorum or Gravel. | 1438.17 | Cum | 144,564.68 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|--|----------------|------|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 35 | 12.0 | Informatory Signs :-Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 80 x 60cms. rectangle as per the design of IRC-67-1977 pre treated with phospheting process & acid teching; coated with one coat of epoxyprimer and two coats of best qualityepoxy paint; reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long stand postand frame fabricated from suitable sizeiron angle of 35 x 35 x 3mm75x75x6mm as required; painted with best qualityepoxy coatings in black and whitebends. the details of symbol for eachboard shall details of symbol for eachboard shall be as per the instruction ofengineer in charge. The fixing at site shall be in 1:2:4 CC block of size 45 x45 x 60cms. for each leg. including excavation curing tec. complete under the supervision of engineer in charge.(A) Engineer Grade(VR) | 3856.90 | Nos. | 46,282.80 |
| 36 | 211.4 | Providing parapet of ordinary cement concrete M-200 as per detailed drawings with necessary reainforcement including, shuttering, laying vibrating and finishing to line and level complete.(ii) Cast in situ. | 1053.64 | Rmt | 222,729.40 |
| 37 | 189.7 | Construction of granular Sub base with Coarse Graded Material (Grade II) (Table:- 400- 2) of 100 mm by providing coarse graded material Metal Crushed using size 53mm to 26.5 mm@ 27.5%, 26.5 mm to 9.5 mm @ 22.5%, 9.5mm to 4.75mm @12.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting BT road by milling machine using motor grader on prepared surface mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1. | 1013.94 | Cum | 192,355.33 |
| 38 | 124.5 | Providing and fixing post and pipe railing as per detailed drawing including 3 coats of painting to steel works complete. | 1204.11 | Rmt | 149,851.73 |
| 39 | 100.0 | Diversion: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by levelling existing ground and constructing suitable compacted embankment, road surface with providing, laying & consolidation of 200 mm WBM in layers on carriage width with safety measures like sign board, guard stone & maintain for motorable road throughout construction period etc. and also dismantie diversion after completion of work etc. complete as per instruction of engineer in charge | 2484.60 | Rmt | 248,460.00 |
| 40 | 35.9 | Providing and casting insitu Controlled Cement Concrete M-25 for R.C.C solid slab including centering, scaffolding, curing and finishing complete | 5256.06 | Cum | 188,692.55 |
| 41 | 34.8 | Providing and casting in situ controlled cement concrete M-25 for approach slab including formwork curing and finishing complete | 5235.67 | Cum | 182,201.32 |
| 42 | 2.6 | Providing and casting in situ controlled cement concrete M-25 for kerbs/kerb blocks including formwork, curing and finishing complete | 4948.59 | Cum | 12,866.33 |
| 43 | 144.4 | Providing & casting-in situ ordinary cement concrete M-20 mix and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, curing and finishing complete with V-Groves (A) Height from 0.0m to 5.0m | 4291.68 | Cum | 619,718.59 |
| 44 | 17.8 | Providing and laying in position Fe 550/550 D CRS TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Solid Slab / App slab / Wearing Coat | 76778.01 | MT | 1,368,184.14 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|---|----------------|------|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 45 | 13.0 | Providing 20mm thick pre-moulded asphalt filler joints as per drawings | 769.62 | Nos. | 10,005.06 |
| 46 | 16.0 | Providing P.V.C 100mm diameter water sprouts including necessary iron gratings as per drawings | 159.36 | Nos. | 2,549.76 |
| 47 | 56.0 | Providing & fixing of of precast R.C.C railing of M-30 Grade Concrete having 2 - tire (Row) of Hand Rail dimensions as shown in detail drawing & Vertical Post such as c/c spacing between vertical posts not to exceed 1.625m including necessary TMT steel, formwork, painting with weatherproof paint etc. | 2147.26 | Rmt | 120,246.56 |
| 48 | 468.0 | Earthwork for embankment including breaking clods, dressing with all lead and lift (Excluding watering & consolidation). (E) From borrow area withing 5.00 km lead | 210.68 | Cum | 98,598.24 |
| 49 | 36.0 | Dismantalling the existing structures including removing and stacking the dismantled materials as and where directed RCC work | 930.35 | Cum | 33,492.60 |
| 50 | 113.0 | Demolition and disposal of unserviceable material with all lift and lead (ii) Unreinforced Concrete | 623.01 | Cum | 70,400.13 |
| 51 | 97.5 | Removing all types of Hume pipes and stacking within a lead of 1000m including Earthwork and dismantling of masonry works as per Technical Specification clause 202 (Rate Analysis) (B) Above 600mm to 900mm dia hume pipes | 419.01 | Rmt | 40,853.48 |
| 52 | 761.0 | Providing and applying one coat epoxy phenolic primer of DFT 50 micron and two coats of polyurethane (aliphatic) epoxy paint-75 micron DFT each or any other equivalent epoxy coating system to all concrete surfaces exposed to atmosphere in Substructure & Super Structure as directed by Engineer and as per specification (R.A) | 233.31 | Sqm | 177,548.91 |
| 53 | 55.7 | Providing and casting in situ controlled cement concrete M-25 for R.C.C raft and cut-off walls including necessary vertical pin headers incl. formwork, vibrating, ramming and curing complete | 4697.25 | Cum | 261,636.83 |
| 54 | 468.0 | Rolling and watering of earthworks in layers with vibratory roller including filling in depressions which occur during the process as directed | 22.95 | Cum | 10,740.60 |
| 55 | 414.0 | Providing and casting in situ ordinary cement concrete M-15 mix and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, curing and finishing complete without V-Groves. (A) Height from 0.0m to 5.0m | 3921.64 | Cum | 1,623,558.96 |
| 56 | 60.0 | Providing and fixing "W" type metal beam crash safety barrier comprising of single row 3 mm thick galvanized sheet to be fixed on ISMC 150 (150 mm x 75 mm x 5.4 mm) series channel vertical post to be spaced 2.0 mtr c/c to be kept 1.65 mtr height including necessary foundation, fitting with bolts, painting, radium indication patta on W beam and required all process as per specification and as per drawings | 3454.20 | Rmt | 207,252.00 |
| 57 | 223.5 | Supplying & laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORTH specification for base/sub-base reinforcement having minimum tensile strength 30KN/m in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm x 38mm mesh opening | 253.51 | Smt | 56,659.49 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|---------|----------------------------------|---|----------------|------|--|
| 1 | 2 | 3 | 4 | 6 | 7 |
| 58 | 38.0 | Road marking with hot applied thermoplastic paints (Yellow color no. 356 on C.C road & white colour on asphalt surfaces) with reflectorising glass beads on bitumin surface providing and laying a hot applied thermoplastic compound 2.5mm thick including reflectorising glass beads @250 gms per sqm area, thickness of 2.5mm is excluding of surface applied glass beds as per IRC: 35-2015. The finished surface to be level, uniform and free from streaks and holes. Zebra patta/bump patta lane/ center line / edge line / cut patta. The white color marking should provide luminance coefficient of cement road shall be min 130 mcd/m ² /lux and asphalt road shall be min 100 mcd/m ² /lux during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section-15 of IRC 35-2015. Warranty for the retro reflectively should be two years | 367.72 | Smt | 13,973.36 |
| 59 | 38.0 | Cat Eye/ road stud/ rpm : Supplying of molded twin shanks raised pavement markers made of polycarbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 13656 kgs tested in accordance to ASTM D 4280 type H and complying to specifications of category A of MORTH circular no RW/NH/33023/10-97 Dt III Dt 11.06.1997. The height, width and length shall not exceed 20mm, 130mm and 130mm and with minimum reflective area of 13 sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 +/- 2 mm and height not less than 30 +/- 2 mm) from the body is to be a minimum value 500 kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturers recommendation and the color of the marker should be as per the IRC 35-2015 and as directed by Engineer in charge | 326.23 | Nos. | 12,396.74 |
| 60 | 12.0 | Hazard marker sign:-Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 90 x 30cms. rectangle as per the design of IRC-67-1977 pre treated with phosphating process & acid teching; coated with one coat of epoxyprimer and two coats of best qualityepoxy paint; reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long stand postand frame fabricated from suitable sizeiron angle of 35 x 35 x 3mm & 50x50x5mm painted with best qualityepoxy coatings. The fixing at site shall be in 1:2:4 CC block of size 45 x45 x 60cms. for each leg. including excavation curing tec. complete under the supervision of engineer in charge.(A) Engineer Grade(VR) | 2423.74 | Nos. | 29,084.88 |
| 61 | 2.0 | Cautionary warning sign :-Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 90 x 90 x 90 cms. equilaterals triangle as per the design of IRC-67-1977 pre treated with phosphating process & acid teching; coated with one coat of epoxyprimer and two coats of best qualityepoxy paint; reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long stand postand frame fabricated from suitable sizeiron angle of 35 x 35 x 3mm & 75x75x6mm painted with best qualityepoxy coatings. The fixing at site shall be in 1:2:4 CC block of size 45 x45 x 60cms. for each leg. including excavation curing tec. complete under the supervision of engineer in charge.(A) Engineer Grade(VR) | 3808.65 | Nos. | 7,617.30 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities |
|-------------|----------------------------------|---|----------------|------|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 62 | 311.0 | Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth consolidating each deposited layer by ramming and watering | 136.91 | Cum | 42,579.01 |
| 63 | 113.0 | Dismantalling the existing structures including removing and stacking the dismantled materials as and where directed Stone Masonary | 409.22 | Cum | 46,241.86 |
| 64 | 200.0 | Excavation for foundation up to 1.5m depth incl. Sorting out & Stacking of useful materials & disposing off the excavated stuff up to 50mt lead (C) Hard Murum | 432.61 | Cum | 86,522.00 |
| 65 | 1.4 | Providing and laying in position FE 500/550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Piers (B) Abutments (C) R.C.C Returns & walls/caps/copings | 73858.69 | MT | 101,924.99 |
| 66 | 0.7 | Providing and laying in position FE 500/550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) R.C.C kerb (B) R.C.C Footpath (C) R.C.C Approach Slab (D) Wearing Coat | 73243.02 | MT | 52,734.97 |
| 67 | 40.4 | Providing and casting in situ ordinary cement concrete M-20 for various thickness wearing coat laid as directed including tamping, vibrating, finishing, curing and filling joints with bitumen complete | 4338.66 | Cum | 175,281.86 |
| 68 | 190.0 | Diversion: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by levelling existing ground and constructing suitable compacted embankment, road surface with providing, laying & consolidation of 200 mm WBM in layers on carriage width with safety measures like sign board, guard stone & maintain for motorable road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge | 1847.29 | Rmt | 350,985.10 |
| 69 | 30.0 | Supplying and fixing reinforced concrete heavy duty non-pressure pipes with collars for culverts carrying heavy traffic as per IS 458-1991 specifications including setting the pipes in C.M. 1:2 watering and laying (to level or slopes) of class NP3 of following internal diameters. (v) 1200mm dia. | 5560.01 | Rmt | 166,800.30 |
| Total : RS. | | | | | 74,613,217.41 |

| It. No. | Quantities estimated out or less | Item of Work | Estimated rate | Unit | Total Amount according to estimated quantities | | |
|--|---|--------------|----------------|------|--|--|---|
| 1 | 2 | 3 | 4 | 6 | 7 | | |
| <p>I/We am/are willing to carry out the work at _____% above/below the (percentage should be written in figure and words only) Estimated rates as mentioned above, amount of my/our tender works out as under.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Estimated Amount Put to Tender: RS. Deduct: % Below Net : RS. In Words RS. (Please Strike out whichever is not applicable)</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Estimated Amount Put to Tender: RS. Add: % Above Total : RS. In Words RS.</p> </td> </tr> </table> | | | | | | <p>Estimated Amount Put to Tender: RS. Deduct: % Below Net : RS. In Words RS. (Please Strike out whichever is not applicable)</p> | <p>Estimated Amount Put to Tender: RS. Add: % Above Total : RS. In Words RS.</p> |
| <p>Estimated Amount Put to Tender: RS. Deduct: % Below Net : RS. In Words RS. (Please Strike out whichever is not applicable)</p> | <p>Estimated Amount Put to Tender: RS. Add: % Above Total : RS. In Words RS.</p> | | | | | | |
| <p>Note:</p> <ol style="list-style-type: none"> The Contractor shall exhibit a board with detailed specification and details of work as directed by the Engineer-In-Charge for which no extra payment shall be made. The labour cess will be deducted as per prevailing rules i.e. 1% of the work done. GST and Income tax TDS will be deducted at a source while making payments of bills In all R.C.C. Items in Rate Analysis Standard Cement Consumption has been taken as per Govt. G.R.: PRC-10/2017 Cement Consumption/16/C Date: 11/05/2017 as stated in S.O.R. therefore in R.C.C. items where there is a change as per actual mix design the cost of difference of cement consumption have been deducted from the rate of original item at the rate of input rate mentioned in all the tender. <p><i>5. Credit of ₹ shall be recovered from 3 RA bill.</i></p> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> <p>Signature of Contractor</p> </div> <div style="text-align: right;"> <p><i>WJ</i> Executive Engineer (R & B) (P) Division Morbi</p> </div> </div> | | | | | | | |

SECTION - 8

SECURITIES AND OTHER FORMS

BID SECURITY (BANK GUARANTEE)

WHEREAS, ----- (name of Bidder) (hereinafter called the "The Bidder") has submitted his bid Dated ----- (Date) for the construction of ----- (Name of Contractor hereinafter called "the Bid")

KNOW ALL PEOPLE by these presents that We -----
(name of Bank) of ----- (name of country) having our
registered office at ----- (hereinafter called
"the bank") are bound unto ----- (name of Employer)
(hereinafter called "The Employer") in the sum of ----- *
for which payment well and truly to be made to the said Employer the Bank itself, his
successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this ----- day of ----- 20

THE CONDITIONS of these obligations are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;

Or

(2) If the Bidder has been notified of the acceptance of his bid by the Employer during the period of Bid Validity:

A Fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or

B. Fails or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders; or

C. does not accept the correction of the Bid Price pursuant to Clause 27
(Correction of Errors)

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the three conditions, specifying the occurred conditions or conditions.

This Guarantee will remain in force up to and including the date **
days after the deadline for submission of Bids as such the deadline is stated in the
Instructions to Bidders or as it may be extended by the Employer, notice of which
extension (s) to the Bank is hereby waived. Any demand in respect of this
guarantee should reach the Bank not later than the above date

DATE

SIGNATURE.....

WITNESS

SEAL

(Signature, name and address)

* The Bidder should insert the amount of the guarantee in words and figures
denominated in Indian Rupees. This figure should be the same as shown in
Clause 16.1 (Bid Security) of the Instructions to Bidders.

****45 days** after the **end of the validity period** of the Bid. Date should be inserted
by the Employer before the Bidding documents are issued.

PERFORMANCE SECURITY

TO,

----- (Name of Employer)
----- (Address of Employer)

WHEREAS ----- (name and address of contractor) (hereafter called "the Contractor") has undertaken, in pursuance of Contracts No. ----- dates ----- to execute ----- (name of Contract and brief description of Works) (hereinafter called "The Contract")

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractors such a bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of ----- (amount of guarantee)* ----- (in words), such sum being payable in types and proportions of currencies in which the Contract price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of ----- (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

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

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

This guarantee shall be valid until 60 days from the date of expiring of the Defect Liabilities period.

Signature and Seal of the guarantor -----

Name of Bank -----

Address -----

Date -----

*An amount shall be inserted by the Guarantor, representing the percentage the Contract price specified in the Contract denominated in Indian Rupees.

ADDITIONAL PERFORMANCE SECURITY

[Clause 34.1. (A)]

TO,

----- (Name of Employer)
----- (Address of Employer)

WHEREAS ----- (Name and address of contractor) (hereafter called "The Contractor") has undertaken, in pursuance of Contracts No. ----- dates ----- to execute ----- (Name of Contract and brief description of Works) (hereinafter called "The Contract")

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract.

AND WHEREAS we have agreed to give the Contractors such a bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of ----- (amount of guarantee) ----- (in words), such sum being payable in types and proportions of currencies in which the Contract prices is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of ----- (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

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

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

This guarantee shall be valid until **28 days** from the project completion date.

Signature and Seal of the guarantor -----

Name of Bank -----

Address -----

Date -----

BANK GUARANTEE FOR ADVANCE PAYMENT

TO,

----- (Name of Employer)

----- (Address of Employer)

----- (Name of Contractor)

Gentlemen:

In accordance with the provisions of the Conditions of Contract, sub-clause 51.1 ("Advance Payment") of the above mentioned Contract, ----- (name and address of Contractor) (hereinafter called "the Contractor") shall deposit with ----- (name of Employer) a bank guarantee his proper and faithful performance under the said Clause of the Contract in an amount of ----- (amount of Guarantee)* - ----- in words).

We, the ----- (bank of financial institution), as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to ----- (name of Employer) on his first demand without whatsoever right of obligation on our part and without his first claim to the Contractor, in the amount not exceeding --- ----- (amount of guarantee)* ----- (in words)

We further agree that no change or addition to or other modifications of the terms of the Contractor or Works to be performed thereunder or of any of the Contract documents which may be made between ----- (name of Employer) and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modifications.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until ----- (name of employer) receives full repayment of the same amount from the contractor.

YOUR'S TRULY

Signature and Seal _____
Name of Bank/ Financial Institution _____
Address _____
Date _____

* An amount shall be inserted by that Bank or Financial Institution representing the amount of the Advance Payment, and denominated in Indian Rupees.

Letter of Acceptance
(Letter head paper of the Employer)

_____ (date)

To, _____ (Name and address of the Contractor)

Dear Sirs,

This is to notify you that your Bid dated _____ for execution of the _____ (Name of the contract and identification number, as given in the Instructions to Bidders) for the Contract Price of Rupees _____ (_____) (amount in words and figures) as corrected and modified in accordance with the Instructions to Bidders* is hereby accepted by our agency.

You are requested to furnish performance security, in the form detailed in para 34.1 of ITB for an amount equivalent to Rs. _____ within **10 days** of the receipt of this letter of acceptance up to beyond **60 days** from the date of expiry of defects Liability period i.e. up to _____ and the Additional Performance Security for an amount equivalent to Rs. _____ shall be valid beyond 28 (twenty-eight) days of Project Completion Date i.e. up to _____ and sign the contract, failing which action as stated in Para 34.3 of ITB will be taken.

Yours Faithfully

Authorized Signature
Name and title of Signatory
Name of Employer

-
- * Delete "Corrected and" or and modified if only one of these actions applies. Delete as corrected and modified in accordance with the Instructions to Bidders, if corrections or modifications have not been affected.

Issue of Notice to proceed with the work

(Letterhead of the Employer)

To, _____ (date)

_____ (Name and address of the Contractor)

Dear Sirs,

Pursuant to your furnishing the requisite security in ITB Clause 34.1 and signing of the Contract for the construction of _____

_____ at a bid Price of Rs.

_____.

You are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully

(Signature, name and title of signatory authorized
To sign on behalf of Employer)

AGREEMENT FORM

This agreement, made on the _____ day of _____ between
_____ (name and address of Employer) (Hereinafter called "the
Employer) and _____ (name and address of
contractor) hereinafter called "the Contractor" of the other part.

Whereas the Employer is desirous that the Contractor execute

Name and identification number of contract (hereinafter called "the works") and the
employer has accepted the Bid by the Contractor for the execution and completion of
such works and the remedying of any defects therein, at a cost of Rs.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS

1. In this Agreement, words and expression shall have the same meanings as are
respectively assigned to them in the conditions of contract hereinafter referred to
and they shall be deemed to form and be read construed as part of this Agreement.
2. In Consideration of the payment to be made by the Employer to the contractor as
hereinafter mentioned, the Contractor hereby covenants with the Employer to
executive and complete the works and remedy any defects therein in conformity
in all aspects with the provisions of the contracts.
3. The employer hereby covenants to pay the Contractor in consideration of the
execution and completion of the works and the remedying the defects wherein
contract price or such other sum as may become payable under the provisions of
the Contract at the times and in the manner prescribed by the contract.
4. The Following documents shall be deemed to form and be ready and construed as
part of this Agreement viz
 - i) letter of Acceptance
 - ii) Notice to proceed with the works:
 - iii) Contractor's Bid

- iv) Conditions of contract: General and Special
- v) Contract Data
- vi) Additional conditions
- vii) Drawings
- viii) Bill of Quantities and
- ix) Any other documents listed in the Contract data as forming part of the Contract.

In witness whereof the parties there to have caused this Agreement to be executed the day and year first before written

The Common seal of _____
Was hereunto affixed in the presence of :

Signed, sealed and Delivered by the said _____

In the presence of

Binding signature of Employer _____

Binding Signature of Contractor _____

UNDERTAKING
(For Investment)

I, the undersigned do hereby undertake that our firm M/s would invest a minimum cash up to 25% of the value of the work during implementation of the contract.

(Signed by an Authorized officer of the firm)

Title of officer

Name of firm

DATE

UNDERTAKING
(For Validity)

I, the undersigned do hereby undertake that our firm M/s
..... agree to abide by this bid for a period days
for date fixed for receiving the same and it shall be binding on us and may be accepted at
any time before the expiration of that period.

(Signed by an Authorized officer of the firm)

Title of officer

Name of firm

DATE

SECTION - 9

DRAWINGS

SECTION - 10

DOCUMENTS TO BE FURNISHED BY BIDDER

Special Condition for Free maintenance guarantee period For New Road Construction

The contractor shall have to give **Five years free maintenance guarantee** from the certified date of completion. During this period contractor shall have to repair the damaged portion of the BT surface of road, and all other executed items at his risk and cost as per direction of Engineers – in – charge. If BT surface during maintenance period of 5 years is worn-out or damaged then, agency shall have to take remedial action as per table below and as directed by Engineer – in – charge. The cost of annual maintenance for five year shall required to be considered while quoting the tender and has to be born by the contractor. The periodicity of routine maintenance activity shall be as follows.

(a) Maintenance of Bituminous surface road and/or Cement concrete road and/or gravel road and/or WBM road including filling pot holes and patch repairs etc as per clause 1904, 1905, 1906 and 1907 of the Specifications for Rural Roads (First Revision) IRC New Delhi 2014 respectively.

| Sr No | Distress and service Level | Remedy | Period to attend for the Contractor |
|-------|--|--|-------------------------------------|
| 1 | Potholes | As per IRC:SP:20-2002 and specifications for rural roads of IRC:2014 | 7 Days |
| 2 | Surface damages/worn out surface in more than 50 meters of lane length in the road stretch | Renewal with wearing coat as originally laid by contractor - as per tender item and specification. | 21 Days |
| 3 | Patch work area exceeds 30% in per KM length | | |

(b) Other maintenance works to be carried out:

| Sr No | Name of Item/Activity | Frequency of operation in one year |
|-------|--|---|
| 1 | Restoration of rain cuts and dressing of berms as per clause 1902 of the Specification for Rural Roads (First Revision) IRC New Delhi 2014. | As and when required |
| 2 | Maintenance of earthen shoulders as per clause 1903 of the Specification Rural Roads (First Revision) IRC New Delhi 2014. | As and when required. |
| 3 | Maintenance of drains as per clause 1908 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Twice in a year before/after monsoon |
| 4 | Maintenance of culverts and causeways including vent clearance as per clause 1909 and 1910 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Twice in a year before/after monsoon |
| 5 | Maintenance of road signs as per clause 1911 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Maintenance as and when required. Repainting once in every two years. |
| 6 | Maintenance of guard rails and parapet rails as per clause 1912 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Maintenance as and when required. Repainting once in a year. |
| 7 | Maintenance of 200 m and Kilo Meter stones as per clause 1913 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Maintenance as and when required. Repainting once in a year. |
| 8 | White washing guard stones | Once in year |
| 9 | Re-fixing displaced guard stones / KM stone / 200 meter stone/Sign board | Once in year |
| 10 | Maintenance of road delineators as per Clause 1914 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | As and when required |
| 11 | Cutting of branches of trees, shrubs and trimming of grass and weeds etc as per clause 1915 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Twice in a year generally before/after rains or as and when required |
| 12 | White washing parapets of CD Works as per Clause 1916 of the Specifications Rural Roads (First Revision) IRC New Delhi 2014. | Once in year |

However Maintenance does not include replacement or erection of new signages / stones etc. at the time of yearly maintenance.

The amount equivalent to 5 % of each bill shall be withheld and will be released after the free maintenance guarantee period of five year is over.

However this amount shall be released against fix deposit or Bank Guarantee pledged in the name of Executive Engineer after completion certificate of work is issued.

The contractor has to carry out routine maintenance as said above & has to report the Engineer-in-charge in the month of May and November of every year with a copy of the record of contractor's inspection and other instructions received from the Engineer- in-charge and maintenance carried out with colour photograph showing before and after maintenance (@ 3 nos. Of photographs per kilo metre of lane length with date and time digitally incorporated to be submitted by the contractor in 3 sets)

In the event of contractor not carrying out routine maintenance within time limit as specified above, the employer will get the maintenance work carried out through any source and the amount required **for this work shall be recovered from the 5% amount withheld for this purpose** available with the employer along with additional 20% of this amount as penalty.

Executive Engineer
Panchayat (R&B) Division
Morbi

ઈ-ટેન્ડરીંગમાં ટેન્ડરફીઆ અન્ય
ડોક્યુમેન્ટસ રજૂ કરવા અંગે.

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
પરિપત્ર ક્રમાંક :- પરચ - ૧૦૨૦૦૮-પ-સ (પોટકાઈલ)
સચિવાલય, ગાંધીનગર
તા. ૨૭-૧૧-૨૦૦૮

-::પરિપત્ર ::-

માગ અને મકાન વિભાગમાં હાલમાં ટેન્ડરો,ઈ-ટેન્ડર પધ્ધતિથી સ્વીકારવામાં આવે છે. તે અન્વયે સમાન ક્રમાંકના તા. ૧૮/૧/૦૮ના પરિપત્રમાં ટેન્ડર ફી અને બાનાની રકમ જે તે કાર્યપાલક ઈજનેરને ખરેખર ચુકવવા માં હિન -પ માં અસલમાં રજીસ્ટર પોસ્ટ એ.ડી. થી મોકલવાની તેમજ અસલમાં ડીમાન્ડ ડ્રાફ્ટ નહિ મોકલનાર સામે શિક્ષાત્મક પગલા લેવાની જોગવાઈ હતી.

ઉપરોક્ત પરિપત્રમાં નીચે મુજબ અંશતઃ સુધારો કરી આ શરતનો સમાવેશ ટેન્ડર નોટીસ..... Through R.P.A.D. so as to E.E. Division - Within 7 days from the last date of uploading ને બદલે " to SE at the time of tender opening or Send the same through R.P.A.D. so as to reach E.E. Division - Within 7 days from the last date of opening. " સુધારો કરવામાં આવે છે. તેમજ ખરેખર ટેન્ડર ફી તેમજ બાનાની રકમ નિયત સમયમાં ઈજારદાર ન ભરે ની ઈજારદારની નોંધ માટે એબેન્સ માં રાખવાની કાર્યવાહી રી ઈ-ટેન્ડરીંગ નો કોર્ડ એક વર્ષ માટે રદ કરાશે.

ગુજરાત રાજ્યપાલશ્રીના હુકમથી અને તેમના નામે.

(આર. કે. ચૌહાણ)
ખાસ કરજ પરના અધિકારી (એસ.પી.)
માર્ગ અને મકાન વિભાગ.

પ્રતિ, :-

- સર્વે મુખ્ય ઈજનેર અને અધિક સચિવશ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
- સર્વે ઉપસચિવશ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
- સર્વે અધિક ઈજનેરશ્રીઓ, રાજ્ય વિભાગ / પંચાયત માર્ગ અને મકાન વર્તુળ / ને.હા. વર્તુળ/ પા.યો. વર્તુળ / રા.મા.યો. વર્તુળ ગાંધીનગર સહિત.
- સર્વે કાર્યપાલક ઈજનેરશ્રી માર્ગ અને મકાન વર્તુળ / પંચાયત માર્ગ અને મકાન વર્તુળ / ને.હા. વર્તુળ / પા.યો. માર્ગ અને મકાન વર્તુળ.
- સર્વે શાખાઓ / મા.મ. વિ. / સચિવાલય, ગાંધીનગર
- સિલેક્ટ ફાઈલ.

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

સહાય અધિકારીની મૂલ્ય મંજૂરી
વગર જમણા વધારાનું કામ ન
કરવા બાબત



ગુજરાત સરકાર,
ભરત અને મકાન વિભાગ
પરિપત્ર ક્રમક-વીઈટી-૬૪૨૦૧૪-૬૮૬-૪
તારીખ ૧૨.૦૧.૨૦૧૬.

સરકારીના પદનામાં આવતું છે કે તાબદની કચેરીએ જાતા સહાય અધિકારીઓની મૂલ્ય મંજૂરી
વગર જમણા વધારાની કામગીરી કરાવી જવાબદારી ઊભી કરવાની પાલિકાને અનુદાનવામાં આવી રહી
છે. તેમજ મદદાજ બનાવવામાં પણ યોગ્યતાઓ અપાવ જણાય છે. આ કલેક્ટમાં નીચે મુજબની
મુદતમાં પાલન કરવા બદલી જણાવવામાં આવે છે.

૧. સહાય અધિકારીની મૂલ્ય મંજૂરી વગર જમણા વધારા અને વધારાની આઈટમની કામગીરી સહ
ધારી જવાબદારી ઊભી કરાવી નહીં.

૨. અંદાજી બનાવવામાં એકસાઈ રાખવી.

(વી.એમ. એઈટી)

ઉપ સચિવ

ભરત અને મકાન વિભાગ

પત્ર,

૧. અધિકારી ઉજનેરશી, ભરત અને મકાન વર્તુલ, વડોદરા.

૨. અધિકારી ઉજનેરશી, ભરત અને મકાન વર્તુલ, સુરત.

૩. અધિકારી ઉજનેરશી, ભરત અને મકાન વર્તુલ નં.૧, અમદાવાદ.

૪. અધિકારી ઉજનેરશી, ભરત અને મકાન વર્તુલ નં.૨, અમદાવાદ.

૫. અધિકારી ઉજનેરશી, ભરત અને મકાન વર્તુલ નં.૧, રાજકોટ.

૬. અધિકારી ઉજનેરશી, ભરત અને મકાન વર્તુલ નં.૨, રાજકોટ.

Please do mention 'order number of this office in further communication

Signature of the Contractor :
મેન્ડુકરની સહી :

Signature of the Executive Engineer
અધિકારી ઉજનેરની સહી :

TB

| | |
|------|----------|
| No | 3384 |
| Date | 22/01/23 |

જે ઇજારદારો રજીસ્ટ્રેશન ધરાવતા હોય
તેમના જ ટેન્ડર ખોલવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ

પરિપત્ર ક્રમાંક- ટીએનસી-10-2015-(FA-591-16)-02-સી
સચિવાલય, ગાંધીનગર
તા.03-06-2015

વચાણે લીધા- (1) ઠરાવ ક્રમાંક- આરજીએન-5006-૮-પાર્ટ-૧-સી તા.૨૭-૦૧-૧૯૯૮
(૨) ઠરાવ ક્રમાંક- આરજીએન-5006-૮-પાર્ટ-૧-સી તા.05-06-2011

પરિપત્ર :-

કેટલીક મા.મ. વિભાગીય કચેરીઓ દ્વારા કોન્ટ્રાક્ટર તરફથી રજીસ્ટ્રેશન રીન્યુઅલ/કેટેગરી રીન્યુઅલની અરજી કરવામાં આવેલ હોય, પણ તેમનું રજીસ્ટ્રેશન રીન્યુઅલ/કેટેગરી રજીસ્ટ્રેશન જેતે ટેન્ડર ખોલવાની તારીખે ન મળેલ હોય/આપવામાં આવેલ ન હોય તેમ છતાં તેમનાં ટેન્ડર ખોલવામાં આવેલ હતાં. પરિણામે આ ટેન્ડર કરીવાર મંગાવવાના થાય છે તેમજ તેના કારણે કામના ચમલીકરણમાં વિલંબ થાય છે. આથી હવે આ બાબતે નીચે મુજબની કાર્યપદ્ધતિ ચુસ્તપણે અમલમાં મુકવાની રહેશે.

કાર્યપાલક ઇજનેરશ્રી/અધિક્ષક ઇજનેરશ્રી દ્વારા ટેન્ડર ખોલવાની તારીખે જે ઇજારદારો જેતે ટેન્ડર માટે પાત્રતા પ્રમાણેની કક્ષામાં રજીસ્ટ્રેશન ધરાવતા હોય તેમજ જેતે ટેન્ડર માટેની જરૂરી કેટેગરી/સ્પેશીલ કેટેગરીમાં પણ રજીસ્ટ્રેશન ધરાવતાં હોય, આમ આ બંને શરતો પૂર્ણ કરતા હોય તેવા ઇજારદારોના જ ટેન્ડર ખોલવાનાં રહેશે.

ટેન્ડર ખોલવાની તારીખે જે ઇજારદારની રજીસ્ટ્રેશન રીન્યુઅલ/કેટેગરી રજીસ્ટ્રેશનની પ્રક્રિયા પૂર્ણ થયેલ ન હોય, તેમના ટેન્ડર ખોલવાનાં રહેશે નહીં. તેમ છતાં આ પ્રકારનાં પાત્રતા ન ધરાવતાં ઇજારદારોનાં ટેન્ડર ખોલવામાં આવશે તો, સંબંધિતોની જવાબદારી નક્કી કરવામાં આવશે તેની ગંભીરતાથી નોંધ લેવી.

આ પરિપત્ર ગુજરાત રાજ્ય બહાર રજીસ્ટર્ડ થયેલ કોન્ટ્રાક્ટર દ્વારા જો ગુજરાતમાં વિભાગના કામોના ટેન્ડર ભરેલ હોય, તેવા કિસ્સામાં લાગુ પડશે નહીં.

સં. A90 EEL.

(ચો. એન. મિસ્ત્રી)
ઉપ સચિવ(રા.ર.)
માર્ગ અને મકાન

ટેન્ડર માટે વાટાઘાટોની તિતી
નક્કી કરવા બાબત.

ગુજરાત સરકાર,
માર્ગ અને મકાન વિભાગ
બ્લોક નં.૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક: એસ/૨૨/૨૦૧૭/૬૩૬/૬.
તા.૦૮/૦૬/૨૦૧૮

આમુખ:-

માર્ગ અને મકાન વિભાગનાં વિવિધ કામો માટે જાહેર નિવિદાથી ટેન્ડર માંગવામાં આવે છે. ક્યારેક ઈજારદારે ભરેલ ટેન્ડરના ભાવ જે તે વિસ્તારમાં ટેન્ડર મંજૂરીના નિર્ણય કરવાના સમયે તે સમયે જે તે ટેન્ડરના કામના વિસ્તારમાં મંજૂર થયેલ અન્ય ટેન્ડરની સરખામણીમાં ઉંચા જણાય તેવા સંજોગોમાં ઈજારદારને વાટાઘાટ માટે બોલાવવામાં આવે છે. ક્યારેક જે તે ટેન્ડર ભરનાર ઈજારદાર વારંવાર વાટાઘાટની તારીખ અને સમય ફાળવ્યાબાદ સક્ષમ અધિકારી પાસે વાટાઘાટ માટે આવતા નથી / વેલીડિટી લંબાવી આપતા નથી. તેમજ વેલીડિટી પીરીયડ પુરો થાય ત્યાં સુધી પોતે વાટાઘાટ કરવા માંગતા નથી તે પ્રકારનો પત્ર પણ આપતા નથી. તે કારણોસર ટેન્ડરની વેલીડિટી પૂર્ણ થવાથી ટેન્ડર ફરીવાર માંગવાની જરૂરીયાત ઉપસ્થિત થાય છે. જેના કારણે પ્રજાલક્ષી કામોમાં વિલંબ પણ થાય છે. પુખ્ત વિચારણાને અંતે નીચે મુજબનો પરિપત્ર કરવામાં આવે છે.

પરિપત્ર:-

ટેન્ડર મંજૂરીની દરખાસ્ત કરતી સમયે જે તે ક્ષેત્રિય કચેરીમાંથી જે તે વિસ્તારનાં સમાન પ્રકારનાં છેલ્લા છ માસમાં મંજૂર થયેલ કામોની વિગતો સાથે કેટલી રકમ સુધીનું ટેન્ડર મંજૂર કરવા પાત્ર રહે છે. તે વિગત સાથે દરખાસ્ત કરવાની રહેશે. ઈજારદારને ટેન્ડર વેલીડિટી તેમજ ટેન્ડર મંજૂરીનો સમયગાળો ધ્યાનમાં લઈ વધુમાં વધુ ત્રણ વખત વાટાઘાટ માટે જાણ કરવામાં આવશે. જો ઈજારદાર વાટાઘાટ કરવા માંગતા ન હોય તો તેમણે વાટાઘાટની સુચના મળ્યાબાદ તરતજ તેઓ વાટાઘાટ કરવા માંગતા નથી તે મુજબનો પત્ર પાઠવવાનો રહેશે. જો ઈજારદાર ટેન્ડરની વેલીડિટી પૂર્ણ થવાના સમયગાળા સુધીમાં પણ આ પ્રકારનો પત્ર પાઠવશે નહીં અથવા વાટાઘાટ કરશે નહીં તો તેમનું ટેન્ડર રદ ગણવામાં આવશે અને તેમની બાનાની રકમ જપ્ત કરવામાં આવશે તેમજ ઈજારદાર પર શિક્ષાત્મક કાર્યોવહી હાથ ધરવામાં આવશે. આ પરિપત્રની તારીખથી Notice Inviting Tenders માં નીચે મુજબની વધારાની વિગત ઉમેરવાની રહેશે.

If found necessary, contractor will be intimated for negotiation. He will be intimated maximum three times within validity period for negotiation. If contractor does not respond in time, his earnest money will be forfeited and his tender will be rejected. Punitive action will be taken on such contractor.

(એ.ચે.એ. પિસ્તી)
ઉપસચિવ (રા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર

(પાછળ)

નકલ સાર રવાના:-

- > મુ.ઇ.શ્રી (મા.મ.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી (પંચાયત) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી (પા.યો.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી (ને.હા.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી (ગુ.નિ.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી (ની. અને આ.), માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી અને નિયામકશ્રી (એસટીસી), માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > મુ.ઇ.શ્રી (વિષ્ બેન્ક), માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- > વહીવટી અધિકારીશ્રી, જીએસઆરડીસી, નિર્માણભવન, ગાંધીનગર.
- > સર્વે અધિક્ષક ઇજનેરશ્રીઓ, માર્ગ અને મકાન વિભાગ (રાજ્ય, પંચાયત, ને.હા., પાટનગર યોજના વર્તુળ, વિદ્યુત વર્તુળ સહીત)
- > સર્વે કાર્યપાલક ઇજનેરશ્રીઓ (ઉક્ત વર્તુળ હેઠળના)

૧૪-૬-૧૯

ક્રમાંક: -એસઓઆર/૧૦૧૮/૭૧૫/પાર્ટ ફાઈલ/સી-૧

ગુજરાત સરકાર,
માર્ગ અને મકાન વિભાગ,
૨૪/૩, મરહુમ ભવન,
સચિવાલય, ગાંધીનગર.
તા.૦૪/૦૬/૨૦૧૯.

પ્રતિ,

- અધિકારી ઈજનેરશ્રી, પા.યો.વર્તુળ, ગાંધીનગર.
- અધિકારી ઈજનેરશ્રી, શહેર (મા.મ.) વર્તુળ, અમદાવાદ.
- અધિકારી ઈજનેરશ્રી, અમદાવાદ મા.મ.વર્તુળ-૧, અમદાવાદ.
- અધિકારી ઈજનેરશ્રી, અમદાવાદ મા.મ.વર્તુળ-૨, અમદાવાદ.
- અધિકારી ઈજનેરશ્રી, વડોદરા મા.મ.વર્તુળ-વડોદરા.
- અધિકારી ઈજનેરશ્રી, સુરત મા.મ.વર્તુળ-સુરત.
- અધિકારી ઈજનેરશ્રી, રાજકોટ મા.મ.વર્તુળ-૧-રાજકોટ.
- અધિકારી ઈજનેરશ્રી, રાજકોટ મા.મ.વર્તુળ-૨-રાજકોટ.
- અધિકારી ઈજનેરશ્રી, (પંચાયત) મા.મ.વર્તુળ, અમદાવાદ.
- અધિકારી ઈજનેરશ્રી, (પંચાયત) મા.મ.વર્તુળ, ગાંધીનગર.
- અધિકારી ઈજનેરશ્રી, (પંચાયત) મા.મ.વર્તુળ-વડોદરા.
- અધિકારી ઈજનેરશ્રી, (પંચાયત) મા.મ.વર્તુળ-સુરત.
- અધિકારી ઈજનેરશ્રી, (પંચાયત) મા.મ.વર્તુળ-૧-રાજકોટ.
- અધિકારી ઈજનેરશ્રી, (પંચાયત) મા.મ.વર્તુળ-૨-રાજકોટ.
- અધિકારી ઈજનેરશ્રી, આલેખન (મા.મ.) વર્તુળ, ગાંધીનગર.

વિષય:- સાર્જન બોર્ડ, રોડ સ્ટડ, કેટ આઈ, આર.પી.એમ. તથા થર્મોપ્લાસ્ટ પટ્ટાની આઈટમોના ટેસ્ટીંગ રીડયુલ બાબત.

સંદર્ભ: - (૧) વિભાગનો તા.૧૮/૧૧/૨૦૧૮ નો સમાનર્થી પત્ર,
(૨) મુ.ઈ. (ગુ.નિ.) અને અ.સ.શ્રી, મા.મ.વિભાગ, ગાંધીનગરના તા.૦૮/૧૦/૨૦૧૮ ના પત્ર ક્રમાંક: ગુ.નિ./ટેસ્ટ રીડયુલ/૯૩

ઉપરોક્ત વિષય અન્વયે જણાવવાનું કે, સંદર્ભ હેઠળના પત્રથી સાર્જન બોર્ડ, રોડ સ્ટડ, કેટ આઈ, આર.પી.એમ. તથા થર્મોપ્લાસ્ટ પટ્ટાની આઈટમોના ટેસ્ટીંગ કરાવવા બાબતે જરૂરી ટેસ્ટ રીડયુલ ચેકલીટ આપેલ છે. જે ફરીથી આ સાથે સામેલ રાખેલ છે. જે ધ્યાને લઈ બાંધકામના કાર્યોમાં ટેન્ડરમાં ટેસ્ટ રીડયુલનું સમાવેશ કરી જરૂરી ટેસ્ટીંગ કરાવવાના રહેશે. જે ધ્યાને લેવા વિનંતી છે.

બિડાણ : સંદર્ભ (૨) હેઠળના પત્રની નકલ.



(સી.એફ.દોશી)
ઉપ સચિવ (મુ.મ.)
માર્ગ અને મકાન વિભાગ

કામના ટેન્ડર ફરીથી માંગવામાં આવે

ત્યારે રાખવાની થતી તકેદારી

ગુજરાત સરકાર

સૂચના ક્રમાંક:-TNC-10-2015-01-C

માર્ગ અને મકાન વિભાગ

સચિવાલય,ગાંધીનગર

તા.૨૫/૦૮/૨૦૧૫

સંદર્ભ:-ગુજરાત તકેદારી આયોગના તા.:૨૩/૦૮/૨૦૧૦ ના પત્ર ક્રમાંક જીએમબી-૧૧૨૦૦૭-૨૫૧૧૫૩-૯
આમુખ:-

ગુજરાત તકેદારી અયોગના ધ્યાને આવેલ કિસ્સા મુજબ,પહેલા ઇજારદાર પોતાની ક્ષમતા બહારના નીચા ભાવો ભરે અને ત્યાર પછી ઇજારદારે ટેન્ડરમાં બિનપોષણક્ષમ ભાવો ભર્યા હોવાથી,કામ નહીં કરી શકે તેવા કારણોસર ટેન્ડર રદ કરાયેલ હોય અથવા વેલીડીટી પીરીયડ માં ટેન્ડર સ્વીકારેલ હોય અને પૂરતી તક મળ્યા છતાં ઇજારદારશ્રી સીક્યુરીટી ડીપોઝીટ ન ભરે,એટલે કે પીછે હઠ કરે ત્યારે અને વ્યાજબી કારણો વગર ઇજારદારશ્રી ચાલુકામ અધુરા છોડે અને કરાર રદ થાય તો આવા સંજોગો માત્ર ઇજારદારશ્રીના કારણોસર ઉદભવ્યા ગણાય.આ સ્થિતિમાં કામનાં ટેન્ડર ફરીથી માંગવામાં આવે ત્યારે રદ કરાયેલ ટેન્ડર/કરારના સંબંધિત ઇજારદારશ્રી પુનઃ ટેન્ડર ભરી શકે છે,જે ભુલ કરનાર ટેન્ડર ભરનારની તરફદારી કરવા સમાન હોય ઇચ્છનીય નથી.

ઉપરોક્ત બાબત અંગે પુખ્ત વિચારણાને અંતે નીચે મુજબની આથી સૂચના આપવામાં આવે છે.અને આ સૂચનાનું ચુસ્તપણે પાલન કરવા સર્વે સંબંધિતોને આથી જણાવવામાં આવે છે.

સૂચના:-

1. પ્રથમ માંગેલ ટેન્ડરમાં ઇજારદારશ્રી પોતાની ક્ષમતા બહારના નીચા ભાવો ભરે અને ઇજારદારશ્રી પાસેથી આ ભાવોનું પુષ્ટીકરણ માંગવામાં આવે અને જો ઇજારદારશ્રી તે જણાવેલ સમયમર્યાદામાં ન આપે અને તે ટેન્ડર બિનપોષણક્ષમ ભાવ ગણી રદ કરી ફરીથી માંગવામાં આવે તે સંજોગોમાં.
2. પ્રથમ માંગેલ ટેન્ડર તેની વેલીડીટી પીરીયડમાં સ્વીકારવામાં આવેલ હોય અને પૂરતી તક આપવા છતાં ઇજારદારશ્રી સીક્યુરીટી ડીપોઝીટ ન ભરે અને કામમાંથી પીછેહઠ કરે તે સંજોગોમાં.
3. વ્યાજબી કારણો વગર ઇજારદારશ્રી ચાલુ કામ અધુરું છોડે અને કરાર રદ થાય તે સંજોગોમાં.
- 4.

(આર.કે.ચૌહાણ)

ખાસ ફરજ પરના અધિકારી(વિ.યો)

માર્ગ અને મકાન વિભાગ

ઈજારદારશ્રીને કરેલ કામનું ચુકવણું
RTGS/NEFT પધ્ધતિએ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
પરિપત્ર ક્રમાંક : SSR-૧૦૨૦૧૭-૫૭-સી.
તા. ૩૦/૦૪/૨૦૧૮

આમુખ:-

ભારત સરકાર દ્વારા ડીઝીટલ ટ્રાંઝેક્શનનો વ્યાપક ઉપયોગ થાય અને બેંકો દ્વારા ઉપલબ્ધ વિવિધ ઓનલાઈન બેંકીંગ સેવાઓનો ઉપયોગ વ્યાપક થાય તે માટે દરેક રાજ્યને સૂચનાઓ આપેલ છે અને રાજ્યોને સહીય સહયોગ આપવા જણાવેલ છે. ગુજરાત સરકાર દ્વારા પણ વિવિધ સરકારી કચેરીઓમાં કેશલેશ ટ્રાંઝેક્શન થાય એ મુજબની વ્યવસ્થા ગોઠવવા માટે વખતોવખત સૂચના આપવામાં આવેલ છે. ઈજારદારશ્રીઓના કરેલ કામનું ચુકવણું RTGS/NEFT થી કરવાની પધ્ધતિથી ઈજારદારશ્રીઓને ઝડપથી નાણા મળી રહે છે. આ નેટ બેંકીંગ પધ્ધતિ ખુબ જ અસરકારક અને હકારાત્મક પુરવાર થયેલ છે. ઈજારદારશ્રીએ કરેલ કામનું ચુકવણું આજના આધુનિક બેંકીંગ પ્રમાણે RTGS/NEFT થી કરવા અંગે મળેલ વિવિધ રજૂઆતો અન્વયે પ્રસ્તુત બાબત સરકારશ્રીની વિચારણા હેઠળ હતી.

પરિપત્ર:-

ગુજરાત તિજોરી નિયમો, ૨૦૦૦ ના નિયમ-૩૩૭ (પ્રકરણ-૧૪) અનુસાર જે તિજોરીઓની રોકડ લેવડ-દેવડ બેંક મારફતે થતી હોય ત્યાં શાખાપત્ર અંગેના નિયમો પ્રકરણ-૧૩ ની જોગવાઈને આધિન રહીને લાગુ પડે છે તેમજ માર્ગ અને મકાન વિભાગના કાર્યપાલક ઈજનેરશ્રીનો ઉપાડ અને વહેંચણી અધિકારી તરીકે Cheque Drawing ના Power ધરાવતા હોઈ, વિભાગીય કચેરી હસ્તકના ઈજારદારશ્રી દ્વારા કરેલ કામોના ચુકવણાં માટે જિલ્લા તિજોરી ખાતે LC એડવાઈઝ મંજૂર કરાવી, LC નો ચેક કાઢી, બેંક મારફતે જે તે ઈજારદારશ્રીને RTGS/NEFT હેઠળ ચુકવણું કરવાનું રહેશે.

ઉપરોક્ત તમામ સૂચનાનો અમલ ચુસ્તપણે તાત્કાલિક અસરથી કરવાનો રહેશે.

આ પરિપત્ર સરખાક્રમાંકની ફાઈલ ઉપર તા.૦૬/૧૨/૨૦૧૭ થી મળેલ નાણાં વિભાગની સંમતિથી બહાર પાડવામાં આવે છે.

(એ.એન.મિસ્ત્રી)
ખાસ ફરજ પરના અધિકારી (વિ.યો.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

63/c.1

**NOTIFICATION
FINANCE DEPARTMENT.**

Sachivalaya, Gandhinagar.
Dated the 14th September, 2018.

Notification No. 50/2018-State Tax

Gujarat
Goods
and
Services
Tax Act,
2017

No.(GHN-89)/GST-2018/S.1(4)TH:- In exercise of the powers conferred by sub-section (3) of section 1 of the Gujarat Goods and Services Tax Act, 2017 (Guj.25 of 2017) and in supersession of the Government Notification, Finance Department No.(GHN-82)/GST-2017/S.1(3)/TH dated the 15th September, 2017, Notification No. 33/2017-State Tax, except as respects things done or omitted to be done before such supersession, the Government of Gujarat hereby appoints the 1st day of October, 2018, as the date on which the provisions of section 51 of the said Act shall come into force with respect to persons specified under clauses (a), (b) and (c) of sub-section (1) of section 51 of the said Act and the persons specified below under clause (d) of sub-section (1) of section 51 of the said Act, namely:-

- (a) an authority or a board or any other body, -
 - (i) set up by an Act of Parliament or a State Legislature;
or
 - (ii) established by any Government,

with fifty-one percent. or more participation by way of equity or control, to carry out any function;
- (b) Society established by the Central Government or the State Government or a Local Authority under the Societies Registration Act, 1860 (21 of 1860);
- (c) public sector undertakings.

This notification shall be deemed to have been issued on the 13th day of September, 2018.

By order and in the name of the Governor of Gujarat,


K H Pathak

Joint Secretary to Government.

સરકારના વિવિધ વિભાગો/
ખાતાઓ દ્વારા જી.એસ.ટી. કાયદા
હેઠળ TDS માટે નોંધણી નંબર
લેવા બાબત.

ગુજરાત સરકાર
નાણાં વિભાગ
પરિપત્ર ક્રમાંક:-જીએસટી/૧૦૧૭/૧૦૯૭/જીએસટી સેલ
સચિવાલય, ગાંધીનગર.
તા. ૧૫/૦૯/૨૦૧૮

૧. વંચાણે લીધો :- નાણાં વિભાગનો તા.૧૯/૦૭/૨૦૧૭ નો પરિપત્ર ક્રમાંક-જીએસટી/૧૦૧૭/૧૦૯૭/ જીએસટી સેલ
૨. વંચાણે લીધો :- નાણાં વિભાગનો તા.૨૫/૧૦/૨૦૧૭ નો પરિપત્ર ક્રમાંક-જીએસટી/૧૦૧૭/૧૦૯૭/ જીએસટી સેલ
૩. વંચાણે લીધો :- નાણાં વિભાગનો તા.૦૮/૦૫/૨૦૧૭ નો પરિપત્ર ક્રમાંક-જીએસટી/૧૦૧૭/૧૦૯૭/ જીએસટી સેલ
૪. નાણાં વિભાગનું તા.૧૪-૯-૨૦૧૮નું જાહેરનામું ક્રમાંક. (GHN-89)/GST-2018/5.1(4)TH.

ગુજરાત ગુડ્સ એન્ડ સર્વિસીસ ટેક્સ એક્ટ, ૨૦૧૭ તથા સેન્ટ્રલ ગુડ્સ એન્ડ સર્વિસીસ ટેક્સ એક્ટ, ૨૦૧૭ ની કલમ ૫૧ અનુસાર જ્યારે કોઈ સરકારી વિભાગ, સ્થાનિક સત્તામંડળ અને સરકાર હસ્તકના જાહેર સાહસો રૂ.૨,૫૦,૦૦૦/- થી વધુની કિંમતનું ટેન્ડર બહાર પાડીને વેરાપાત્ર યીજપસ્તુઓ ખરીદે કે વેરાપાત્ર સેવાઓ મેળવે તો કુલ ૨% (બે ટકા) ટેક્સ ડીડક્શન એટ સોર્સ કરવાનું થાય, જેમાં ૧% (એક ટકો) ગુજરાત ગુડ્સ એન્ડ સર્વિસીસ ટેક્સ અને ૧% (એક ટકો) સેન્ટ્રલ ગુડ્સ એન્ડ સર્વિસીસ ટેક્સ હેઠળ કાપવાનો થાય અને **SGST: 00060010101** તથા **CGST: 00050010101** સદરે, જે મહિનામાં ડીડક્શન થયું હોય તેના અંત પછીનાં ૧૦ દિવસની અંદર, સરકારી તિજોરીમાં જમા કરાવવાના રહેશે. વધુમાં, આ કપાત સામે કોન્ટ્રાક્ટરને ટી.ડી.એસ.ની કપાત કરનારે નમૂના GSTR-7A માં પ્રમાણપત્ર આપવાનું રહેશે તથા કરાવેલ સમય મર્યાદા મુજબ નમૂના GSTR-7 માં પત્રક ભરવાનું રહેશે.

આ કલમનો અમલ જી.એસ.ટી. કાઉન્સિલની ભલામણ મુજબ તા.૩૦-૯-૨૦૧૮ સુધી મુલતવી રાખેલ હતો, જેનો અમલ હવે સંદર્ભમાં વંચાણે લીધેલા તા.૧૪-૯-૨૦૧૮ના જાહેરનામા અનુસાર તા.૧-૧૦-૨૦૧૮ થી કરવાનો થાય છે, જેના માટે ગુજરાત જીએસટી અધિનિયમ, ૨૦૧૭ની કલમ ૨૫ તથા ગુજરાત જીએસટી રૂલ્સ, ૨૦૧૭ના નિયમ ૧૨ (૧) અન્વયે ટેન્ડર દ્વારા ખરીદી કરનાર કે સેવા મેળવનાર સરકારી સક્ષમ અધિકારીએ નમૂના GST REG-07 માં અરજી કરીને નોંધણી દાખલો મેળવવાનો રહે છે.

ઉક્ત જોગવાઈઓનો અમલ તમામ સરકારી વિભાગ, સ્થાનિક સત્તામંડળ અને સરકાર હસ્તકના જાહેર સાહસોએ તા.૧-૧૦-૨૦૧૮ થી કરવાનો હોઈ, તાત્કાલિક અસરથી જીએસટી નેટવર્ક ઉપર ઓન-લાઈન વિગતો ભરીને તથા જરૂરી પૂરાવા અપલોડ કરીને નોંધણી દાખલો મેળવી લેવો જરૂરી બને છે. આથી, સર્વે વિભાગો, ખાતાના વડા, તાબાની તમામ કચેરીઓ અને સ્થાનિક સ્વરાજ્યની તમામ સંસ્થાઓ, જેવી કે મહાનગરપાલિકા, નગરપાલિકા, શહેરી વિકાસ સત્તામંડળ, જિલ્લા પંચાયત, તાલુકા પંચાયત, ગ્રામ પંચાયત તેમજ સરકારી બોર્ડ અને કોર્પોરેશન, સરકારી કંપનીઓ, એસપીવી, વગેરે ને તેમના કાર્યક્ષેત્ર અને કામગીરી અનુસાર લાગુ પડવાપાત્ર હોય તો સત્વરે નોંધણી દાખલો મેળવી લેવા જણાવવામાં આવે છે. સદર કામગીરી માટે કોઈ કાયદાકીય માર્ગદર્શન કે ટેકનિકલ માર્ગદર્શન માટે જરૂર જણાય તો નજીકની રાજ્ય કર કચેરી અથવા જીએસટી નેટવર્કની હેલ્પલાઈન અથવા રાજ્ય કર કમિશનર દ્વારા અમદાવાદ અને અન્ય કચેરીઓમાં શરૂ કરવામાં આવેલ હેલ્પ ડેસ્કનો સંપર્ક કરવા જણાવવામાં આવે છે.

ગુજરાતના રાજ્યપાલશ્રીના હુકમથી અને તેમના નામે



(કે.એચ.પાઠક)

સંયુક્ત સચિવ (ટેક્સ)

નાણાં વિભાગ.

નકલ રવાના જાણ તથા જરૂરી અમલ સારૂ:-

- સચિવાલયનાં સર્વે વિભાગના અધિક મુખ્ય સચિવશ્રી/અગ્રસચિવશ્રી/ સચિવશ્રી
- તમામ કલેક્ટરશ્રી તથા ડીડીઓશ્રી
- તમામ બોર્ડ/ કોર્પોરેશન
- તમામ સ્થાનિક સ્વરાજ્યની સંસ્થાઓ

ક્રમાંક/ગુ.નિ./ટેસ્ટ શિક્ષણ/૯૩

ગુજરાત સરકાર,
ગુણવત્તા નિયમન,
માર્ગ અને મકાન વિભાગ,
સચિવાલય, માંધીનગર
તા.૦૮/૧૦/૨૦૧૮

પ્રતિ,

મુખ્ય ઈજનેર (પા.યો.) અને અધિક સચિવશ્રી,
માર્ગ અને મકાન વિભાગ,
સચિવાલય, માંધીનગર.

વિષય:- એસ.ઓ.આર. માં સમાવેશ થયેલ નવીન આઈટમનો ટેસ્ટિંગ
ટેસ્ટ શિક્ષણમાં સમાવેશ કરવા બાબત.

ઉપરોક્ત વિષયના અનુસંધાનમાં જયભારત સહ જણાવવાનું કે નીચે મુજબ
ની ત્રણ આઈટમ નો એસ.ઓ.આર. માં સમાવેશ થયેલ છે.

- (૧) રીટ્રો રીફલેક્ટીવ શીટીંગ હોર સાઈનેઝ
- (૨) રોડ રટડ/ક્રેટ આઈઝ/આર.પી.એમ.
- (૩) હોટ એપ્લાઈડ થર્મોપ્લસ્ટ માઈંગ

આ આઈટમના રપેસીફિકેશન મુજબ આ સાથે સામેલ ટેસ્ટ શિક્ષણ નો
ટેસ્ટમાં સમાવેશ કરવાનો થાય છે. આ ટેસ્ટ શિક્ષણ ને કમીટીમાં રજુ કરી મંજૂર કરવા
આગળની કાર્યવાહી થવા વિનંતી છે.

બિડાણ- ટેસ્ટ શિક્ષણ.

Jagandi
(જે.એ.માંધી)

મુખ્ય ઈજનેર (ગુ.નિ.) અ.સ.શ્રી,
માર્ગ અને મકાન વિભાગ,
સચિવાલય, માંધીનગર.

13/10/18
10/10/18

TEST SCHEDULE

| St. No. | Materials | Code of Practice | Onsite / Laboratory | Name of Laboratory Test | Co-efficient of Retro Reflection |
|---------|---|---------------------------|---|-------------------------|----------------------------------|
| 1 | 2 | 3 | 4 | 5 | |
| 1 | Retro Reflective Sheeting for the Signage | IRC 67: 2012; ASTM D-4956 | On Site Testing with Reflectometer make: Delta, Zelintner, Roadvista - complying to ASTM D 4956 | | |

Reference Table

6

Class-B type-II High Intensity Grade

| Observation Angle | 0.1° | 0.1° | 0.2° | 0.2° | 0.5° | 0.5° |
|-------------------|------|------|------|------|------|------|
| Entrance Angle | 4° | 130° | 4° | 130° | 4° | 130° |
| White | 500 | 360 | 360 | 270 | 170 | 130 |
| Yellow | 300 | 175 | 360 | 270 | 170 | 130 |
| Green | 20 | 32 | 360 | 270 | 170 | 130 |
| Red | 90 | 42 | 360 | 270 | 170 | 130 |
| Blue | 42 | 20 | 360 | 270 | 170 | 130 |

Class-C Type-III Micro Prismatic Grade

| Observation Angle | 0.1° | 0.1° | 0.2° | 0.2° | 0.5° | 0.5° | 1.0° | 1.0° |
|-------------------|------|------|------|------|------|------|------|------|
| Entrance Angle | 4° | 130° | 4° | 130° | 4° | 130° | 4° | 130° |
| White | 830 | 325 | 800 | 435 | 420 | 335 | 110 | 90 |
| Yellow | 620 | 245 | 600 | 435 | 420 | 335 | 110 | 90 |
| Green | 23 | 33 | 50 | 47 | 31 | 42 | 15 | 12 |
| Red | 125 | 50 | 47 | 31 | 42 | 15 | 12 | 7 |
| Blue | 37 | 35 | 26 | 19 | 15 | 12 | 7 | 2 |

| Frequency of Test | 3 Readings per 100m ² per 100m ² per 100m ² |
|-------------------|--|
|-------------------|--|

| | | | | | | |
|---|--|------------------------------------|------------------------------------|---|--|--|
| 2 | Road Studs / Cat eyes / RPM (Raised Pavement Marker) | IRC 35:2015; ASTM D4280 | Laboratory Testing | Compressive Strength | Compressive Strength (Breaking load) - 13635kgf without breakage | 1 Sample for each color per Lot/D2 and |
| | | IRC 35: 2015; ASTM D4280 | Laboratory Testing | Flexural Strength | 909kgf without breakage or significant deformation (3.3mm) | 1 Sample for each color |
| | | IRC 35:2015; ASTM D4280 | Laboratory Testing | Resistance to Lens Cracking, Lens Impact Strength | No More than 2 radial cracks longer than 6.4mm | 1 Sample for each color |
| | | IRC 35: 2015; ASTM D4280 | Laboratory Testing | Co-efficient of Luminous Intensity - ASTM D4280 | Co-efficient of Luminous Intensity (C.I.I.) | 1 Sample for each color |
| 3 | Hot Applied Thermoplast Road Marking | IRC 35: 2015; Section 800 of MORTH | On Site Testing with Reflectometer | (RI) Retro Reflectivity (mcd/m ² /lux) | Retro Reflectivity (mcd/m ² /lux) | 15. kgm. 2m ² for every 5 Km road |
| | | | | | | |
| | | IRC 35:2015; Section 800 of MORTH | Laboratory Testing | Proportions of Constituents of Marking Material | Complement Gypsum Glass Beads Titanium Dioxide Calcium Carbonate and Iron Pigments | 1 Sample for each color |
| | | | | | | |
| | | IRC 35:2015; Section 800 of MORTH | On Site Testing | Skid Resistance | Not less than 45 BPN (British Pendulum Number) as per BS.6044 | 3 Samples for each color |
| | | | | | | |

9.9

ટેન્ડરમાં ભરેલ અસામાન્ય ઉંચા ભાવોના સંદર્ભે કામ પર પડતા ખર્ચ પર નિયંત્રણ રાખવા તથા કામની નાણાંકીય પ્રગતિ ભૌતિક પ્રગતિ સાથે સુમેળમાં રહે તે માટે જરૂરી જોગવાઈ કરવા બાબત.

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ,
પરિપત્ર ક્ર : પરચ/૧૦૨૦૦૮/(૬૧)/સ
તારીખ : ૨૭/૧૧/૦૮

પરિપત્ર :-

ટેન્ડરમાં અસામાન્ય ઉંચા કે નીચા ભાવો ઈજારદારશ્રીઓ દ્વારા ઘણી વાર ભરાતા હોવાનું સરકારશ્રીના ધ્યાન પર આવેલ છે. આવા કિસ્સાઓમાં કામની નાણાંકીય પ્રગતિ અને ભૌતિક પ્રગતિને સુમેળ ન રહેવાની સંભાવના રહેલી છે. આથી કામની ભૌતિક પ્રગતિ પ્રમાણે નાણાંકીય પ્રગતિ રહે કે જેથી સરકારશ્રી પર સમય પહેલાં અયોગ્ય નાણાંકીય બોજ ન પડે તે માટે નીચે મુજબની જોગવાઈ ટેન્ડરમાં કરવાનો નિર્ણય કરવામાં આવેલ છે. આ જોગવાઈ તમામ કામોના આ પરિપત્રની તારીખ પછી મંજૂર થતાં ડી.ટી.પી.માં અચૂક પાલો કરવાની રહેશે.

જોગવાઈ :-

જે કોઈ આઈટમનો ભરેલ ભાવ, તે આઈટમના ટેન્ડરમાં મુકેલ અંદાજી ભાવ કરતા ટેન્ડરમાં મુકેલ અંદાજી રકમથી સમગ્ર ટેન્ડર જેટલા ટકા ઉંચુ કે નીચુ મંજૂર થયું હોય તે ટકાવારીથી ૧૦% થી વધુ ઉંચો રહેતો હોય તેવી આઈટમનું ચુકવણું રનીંગ બિલ વખતે જે તે આઈટમનાં અંદાજી ભાવ +/- મંજૂર ટેન્ડરની ટકાવારી + તે આઈટમના અંદાજી ભાવની ૫% ની મર્યાદામાં કરવામાં આવશે. આ રીતે વીથહેલ રાખેલ રકમ કામ સંતોષકારક રીતે પુર્ણ થયે કાઈનલ બિલ મંજૂર કરતી વખતે વ્યાજભારણ વગર છુટી કરવામાં આવશે.

ઉદાહરણ :-

ઉક્ત જોગવાઈની સ્પષ્ટ સમજણ માટે આ સાથે આપેલ ઉદાહરણ ધ્યાને લેવું.

| | | | |
|----|---|---|----------|
| ૧. | ટેન્ડરમાં મુકેલ અંદાજી રકમ | : | રૂ.૧૦૦/- |
| ૨. | મંજૂર થયેલ ટેન્ડરની રકમ | : | રૂ.૧૧૦/- |
| ૩. | ટેન્ડરમાં મુકેલ અંદાજી રકમ સામે ખરેખર મંજૂર થયેલ ટેન્ડરની ટકાવારી | : | ૧૦% |
| ૪. | ટેન્ડરની એક આઈટમનો ટેન્ડરમાં મુકેલ અંદાજી ભાવ | : | રૂ.૧૦/- |
| ૫. | તે આઈટમનો ભરેલ ભાવ | : | રૂ.૧૪/- |

| | | | |
|---|--|---|--|
| ૬. | તે આઈટમમાં ભરેલ ઉંચા ભાવની ટકાવારી | : | ૪૦% |
| ૭. | તે આઈટમ માટે રનીંગ બિલ વખતે ચુકવવાપાત્ર ભાવ | : | રૂ.૧૦ + કો.૩ પ્રમાણે ૧૦% ઉંચા + અંદાજી ભાવના ૫% = રૂ.૧૧.૫૦ |
| ૮. | ફાઈનલ બિલ વખતે વ્યાજ ભારણા વગર ચુકવવાપાત્ર થતો વીથ હેલ્ડ રાખેલ ભાવ | : | રૂ.૧૪.૦૦-૧૧.૫૦ રૂ.૨.૫૦ |
| જો સદર આઈટમના ભાવ રૂ.૧૨.૦૦ કે તેથી નીચે ભરેલ હોત તો રનીંગ બિલમાં ભાવ કપાત આ જોગવાઈ મુજબ કરવાની રહેત નહીં. | | | |

(આર.કે.ચૌહાણ)
ખાસ ફરજ પરના
અધિકારી
માર્ગ અને મકાન
વિભાગ.

પ્રતિ,

તમામ અધિક્ષક ઈજનેરશ્રીઓ, માર્ગ અને મકાન વિભાગ.

તમામ કાર્યપાલક ઈજનેરશ્રીઓ, મા.મ. વિભાગ.

નકલ રવાના :

૧. સચિવશ્રીના અંગત મદદનીશશ્રી, મા.મ. વિભાગ.
૨. તમામ મુખ્ય ઈજનેરશ્રી અને અ.સ.શ્રી, મા.મ.વિભાગ.
૩. તમામ તાંત્રિક ઉપસચિવશ્રીઓ, મા.મ. વિભાગ.
૪. ના.કા.ઈ.શ્રીઓ, મા.મ. વિભાગ પ્રોપર.
૫. નાણા શાખા, મા.મ. વિભાગ.
૬. ના.સે.અ. સિલેક્ટ ફાઈલ.
૭. શાખા સિલેક્ટ ફાઈલ.

ટેન્ડરમાં ભરેલ અસામાન્ય ઉંચા ભાવોના સંદર્ભે કામ પર પડતા ખર્ચ પર નિયંત્રણ રાખવા તથા કામની નાણાંકીય પ્રગતિ સાથે સુમેળમાં રહે તે માટે જરૂરી જોગવાઈ કરવા બાબત.

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ,
પરિપત્ર ક્ર : ૫૨૩ / ૧૦૨૦૦૮ / (૬૧) / સી
તારીખ : ૦૩/૦૫/૧૩

વંચાણે લીધા:- પરિપત્ર ક્રમાંક :- ૫૨૩ / ૧૦૨૦૦૮ / (૬૧) / સી તા. ૨૭/૧૧/૨૦૦૮

આમુખ :-

ટેન્ડરમાં ઈજારદારશ્રીઓ દ્વારા ભરાતા Imbalance ભાવો વાળા ટેન્ડરના કિસ્સાઓમાં ઈજારદારશ્રીઓ દ્વારા ઉંચા ભાવની આઈટમોની કામગીરી કર્યા બાદ નીચા ભાવની આઈટમોની કામગીરી ન કરવામાં આવે તેવી પરિસ્થિતિ પર નિયંત્રણ રાખવા માટે તા. ૨૭-૧૧-૨૦૦૮ નો પરિપત્ર જરૂરી જોગવાઈ સાથે બહાર પાડવામાં આવેલ. આ પરિપત્ર અંગે વિવિધ સ્તરોએ થયેલ રજૂઆતોને ધ્યાને લેતાં અને તેના પર પુખ્ત વિચારણાના અંતે આ પરિપત્રના બીજા ફકરાની છેલ્લી લીટી " આ રીતે વીથહેલ્ડ રાખેલ રકમ કામ સંતોષકારક રીતે પૂર્ણ થયે ફાયનલ બીલ મંજૂર કરતી વખતે વ્યાજભારણ વગર છૂટી કરવામાં આવશે " તેની જગ્યાએ નીચે મુજબનો સુધારો કરવામાં આવે છે.

સુધારો :-

" આ રીતે વીથહેલ્ડ રાખેલ રકમ અસાધારણ નીચા ભાવ ભરેલ હોય તેવી આઈટમની નાણાંકીય પ્રગતિના પ્રમાણસર રનીંગ બીલમાંથી છૂટી કરવાની રહેશે. જે કિસ્સામાં અસાધારણ નીચા ભાવ ભરેલ કોઈપણ આઈટમ ન હોય તેવા કિસ્સામાં અસાધારણ ભાવો ભરેલ આઈટમની સામે વીથહેલ્ડ રાખેલ રકમ બાકી રહેતી કામગીરી થાય તેના પ્રમાણસર રનીંગ બીલમાંથી છૂટી કરવાની રહેશે." વધુમાં વંચાણે લીધેલ પરિપત્ર ના ઉદાહરણમાં દર્શાવેલ ક્રમાંક - ૮ રદ કરવામાં આવે છે. ઉપરોક્ત સુધારાનો અમલ આ પરિપત્રની તારીખ પછી મંજૂર થતા ડી.ટી.પી.માં અચૂકપણે કરવાનો રહેશે.

(આર.કે.ચૌહાણ)
ખાસ ફરજ પરના
અધિકારી(વિ.યો.)
માર્ગ અને મકાન વિભાગ.

પ્રતિ,

સર્વે અધિક ક ઈજનેરશ્રીઓ, મા.મ. વિભાગ (પાટનગર યોજના વર્તુળ, નેશનલ હાઈવે વર્તુળ સહિત)

સર્વે અધિક ક ઈજનેરશ્રીઓ, (પંચાયત) મા.મ. વિભાગ

સર્વે કાર્યપાલક ઈજનેરશ્રીઓ, મા.મ. વિભાગ.

સર્વે કાર્યપાલક ઈજનેરશ્રીઓ, (પંચાયત) મા.મ. વિભાગ.

નકલ રવાના :

૧. અગ્રસચિવશ્રીના અંગત મદદનીશશ્રી, મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર
૨. સર્વે મુખ્ય ઈજનેરી અને અ.સ.શ્રીઓ, મા.મ.વિભાગ.
૩. સર્વે તાંત્રિક ઉપસચિવશ્રીઓ, મા.મ. વિભાગ.
૪. ના.કા.ઈ.શ્રીઓ, મા.મ. વિભાગ
૫. નાણાં શાખા, મા.મ. વિભાગ.
૬. ના.સે.અ. સી શાખા, મા.મ. વિભાગ, સિલેક્ટ ફાઈલ.
૭. શાખા સિલેક્ટ ફાઈલ ૨૦૧૩.

બાંધકામ મટીરીયલ્સ તેમજ કોમ્પ્યોનેન્ટ્સ સેમ્પલની

ગુણવત્તા માટેના પરિક્ષણ પૈકીના ૮૦ %પરીક્ષણ

સ્થળ પર તથા ૧૦ %પરિક્ષણ સરકાર માન્ય

લેબોરેટરી ગેરી દ્વારા તથા ૧૦ %ગેરી

લેબોરેટરીમાં કરાવવા બાબત

ગુજરાત સરકાર ,

માર્ગ અને મકાન વિભાગ,

પરિપત્ર ક્રમાંક :-પરચ /૧૦૨૦૦૭/૨૮/સી

સચિવાલય,ગાંધીનગર

તા.૧૩/૦૫/૨૦૧૯

વંચાણે લીધા :-મા.મ વિનો પરિપત્રનંબ ક્રમાંક:-પરચ/૧૦૨૦૦૭/૨૮/સી,તા.૩૧/૧૨/૨૦૦૯

આમુખ:-

માર્ગ અને મકાન વિભાગનાં બાંધકામના માલસામાનને પરિક્ષણો માટે સંદર્ભમાંદર્શાવેલ પરિપત્ર બહાર પડવામાં આવેલ હતો આ પરિપત્રમાં દર્શાવેલ માલસામાન માટે પરિક્ષણોની સંખ્યાનાં ૧૦ %નમુનાના પરિપત્રો ઓછામાં ઓછુ એક પરીક્ષણ ગેરીમાં કરાવવા,૧૦ %નમુનાનાં પરિક્ષણો સરકાર માન્ય લેબોરેટરીનો તથા ૮૦ % નમુનાના પરિક્ષણો પ્લાન્ટ સાઈટ પર કરવાની સુચના આપેલ હતી સમય જતા ગેરીમાંથી સમયસર પરીક્ષણોના પરીણામો કામના ભારણને કારણે સમયમર્યાદામાં મળતા ન હતા તેમજ જીલ્લા કક્ષાની ગેરી લેબોરેટરીમાં મર્યાદીત મટીરીયલ ના પરીક્ષણો તથા હોય કેટલાંક મટીરીયલના પરીક્ષણો ગેરીની અન્ય જીલ્લાની લેબોરેટરીમાં આપવાના થાય છે.ક્ષેત્રો કચેરીની રજૂઆત અન્વયે આ પરિપત્રમાં સુધારા કરવાની બાબત વિચારણા હેઠળ હતી ઉક્ત વિચારણા હેઠળ હતી ઉક્ત વિચારણાને અંતે પ્રસ્તુત પરિપત્રમાં નીચે મુજબ ફેરફાર કરવામાં આવે છેજે આ પરિપત્ર કચીની તારીખથી અમલમાં મુકવાનો રહેશે.

પરિપત્ર :-

બાંધકામના માલસામાનનાં કરવા પાત્ર પરીક્ષણો પ્લાન્ટ સાઈટ પર ૧૦૫ પરીક્ષણો સરકાર માન્ય લેબોરેટરી અને ૧૦ %પરીક્ષણો ગેરી/સરકારી ઈજનેરી કોલેજ /સરકારી પોલીટેકનીક કોલેજમાં કરવાના રહેશે દરેક માલસામાનનું ઓછામાં ઓછુ એક પરીક્ષણ ગેરીમાં કરવાનું રહેશે

ઉક્ત જોગવાઈઓ સિવાય મા.મ વિભાગના તા.૩૧/૧૨/૨૦૦૯ ના પરિપત્રની અન્ય જોગવાઈ /શરતો યથાવત રહેશે

(એ.એન.મિસ્ત્રી (

ખાસ ફરજ પરના અધિકારી)વિ.યો(

માર્ગ અને મકાન વિભાગ

ક્રમાંક:-એસ/૨૫૨૦૨૦/૧૩૮/સી.

ગુજરાત સરકાર,
માર્ગ અને મકાન વિભાગ
સચિવાલય, ગાંધીનગર
તા. ૧૮/૦૮/૨૦૨૦

પ્રતિ,
સર્વે અધિક્ષક ઈજનેરશ્રીઓ,
મા.મ રાજ્ય વર્તુળ તમામ
મા.મ પંચાયત વર્તુળ તમામ
મા.મ)રા.ધો.(વર્તુળ તમામ
પા.યો વર્તુળ,ગાંધીનગર
શહેર)મા.મ (વર્તુળ,અમદાવાદ

વિષય : રૂ ૫ કરોડ થી વધુ રકમનાં ટેન્ડરનાં ડીટીપી માટે પ્રગતી-જી
અન્વયે રાખવાનું થતુ વધારાનું ચેક લીસ્ટ

ઉપરોક્ત વિષય પરત્વે સવિનય જણાવવાનું કે, ઉચ્ચકક્ષાએથી થયેલ નિર્ણય અનુસાર પ્રગતી -જી મોડ્યુલ માટે રૂ ૫ કરોડ અથવા તેથી વધારે રકમ ની વહીવટી મંજૂરીવાળા કામો માટે હાલમા ડેટા એન્ટ્રી કરવામાં આવે છે.તેની જગ્યા એ પ્રગતી -જી ની વધારાની ફિલ્ડની વિગતો એનપ્રોક્યોરમાં ટેન્ડર અપલોડ કરવામાં આવે છે તે સમયે નાખવાની રહે છે.આ બાબતે પ્રગતી -જી નો સ્ક્રીનશોટ તેમજ જરૂરી ચેકલીસ્ટ બિડાણમાં સામેલ રાખેલ છે.હવે રજુ કરવાના તથા રૂ ૫ કરોડ કે તેથી વધુ રકમની વહીવટી મંજૂરીની રકમવાળા કામો માટે ડીટીપી ની સાથે જ વધારાનું ચેકલીસ્ટ સામેલ રાખવાનું રહેશે.

)એ.એન.મિસ્ત્રી(

ખાસ ફરજ પરના અધિકારી

) વિયો(

માર્ગ અને મકાન વિભાગ

નકલ રવાના ---:સર્વે મુખ્ય ઈજનેરશ્રીઓના અંગત મદદનીશશ્રીઓને અમલીકરણ સારું.

ડીટીપીની મંજૂર વખતે ડીટીપી સાથે રહવાના તથા પ્રગતી -જી નાં જરૂરી ફિલ્ડ માટેનું ચેકલીસ્ટ

| | | |
|---|----|--|
| કામનું નામ | :- | |
| પ્રોજેક્ટ ગુજરાત સરકાર નો છે કે કેન્દ્ર સરકારનો | :- | ગુજરાત સરકાર માટે GOG કેન્દ્ર સરકાર GOI ,ખાનગીકરણ માટે PPP,ફંડમાંથી હોયતો OWN FUND |
| પ્રાયોરીટી સ્કેલ | :- | માન મુખ્યમંત્રીશ્રી /માન વડાપ્રધાનશ્રી દ્વારા ભૂમિ પૂજન થયેલ હોય તો -૧ અન્ય માન,મંત્રીશ્રી દ્વારા ભૂમિપૂજન થયેલ હોય -૨ અન્ય કિસ્સામાં -૩ |
| પ્રોજેક્ટ ટાઇપ | :- | મકાન અથવા પુલ જે કામ એકજ સ્થળે હોય તેના માટે સ્ટેશનરી 'રસ્તા જેવા કે લીનીયર કામો માટે લેન્થ અથવા KMZ ફાઈલ |
| પ્રોજેક્ટ ટાઇપ સ્ટેશનરી હોય તો | :- | સ્થળનાં લોંગીટ્યુટ,લેટીટ્યુટ દર્શાવવા |
| પ્રોજેક્ટ રોડ ટાઇપ હોય લીનીયર હોય તો | :- | (૧)કામની શરૂઆત લોંગીટ્યુટ,લેટીટ્યુટ અને કામના અંતના લોંગીટ્યુટ,લેટીટ્યુટ દર્શાવવા અથવા ટેન્ડર અપલોડ કરતી KMZફાઈલ તૈયાર રાખવી. |

કાર્યપાલક ઈજનેરશ્રી

મા.મ વિભાગ

રાજ્ય સરકારના બાંધકામ માટે વપરાતા ગૌણ
ખનીજની રોયલ્ટી ભરવા બાબત.

ગુજરાત સરકાર
ઉધોગ અને ખાણ વિભાગ,
ઠરાવ ક્રમાંક : એમએમઆર/૧૧૨૦૦૦/૨૦૧૩/છ
સચિવાલય, ગાંધીનગર
તારીખ :- ૧-૯-૨૦૦૪

વંચાણે લીધા :-

- (૧) ઉધોગ ખાણ અને ઉર્જા વિભાગનો ઠરાવ ક્રમાંક : એમસીઆર- ૨૧૬૮-૭૩૮૦-છ
તા. ૧૨/૧૨/૧૯૬૯
- (૨) ઉધોગ ખાણ અને ઉર્જા વિભાગનો ઠરાવ ક્રમાંક : એમસીઆર- ૨૧૬૮-૮-૬૬૮૫-છ
તા. ૧/૧/૧૯૮૭
- (૩) ઉધોગ ખાણ અને ઉર્જા વિભાગનો ઠરાવ ક્રમાંક : એમસીઆર- ૨૧૮૮-(૮)૬૫-છ
તા. ૨૫/૧/૧૯૮૧
- (૪) ઉધોગ અને ખાણ વિભાગનો ઠરાવ ક્રમાંક : એમસીઆર-૧૦૯૭-૨૮૫૬-
છ, તા. ૬/૧૧/૧૯૮૭
- (૫) માન. મુખ્યમંત્રીશ્રીના અધ્યક્ષપણા હેઠળ યોજાયેલ એમ્પાવર્ડ કમીટીની
તા. ૧૮/૬/૨૦૦૪ ની બેઠકની કાર્યવાહી નોંધ.

ઠરાવ :-

ઉધોગ, ખાણ અને ઉર્જા વિભાગના સંદર્ભે - (૩) હેઠળના ઠરાવથી એવી જોગવાઈ કરવામાં આવેલ કે રાજ્ય સરકારના, પંચાયતોના અને સરદાર સરોવર નર્મોદા નિગમના બાંધવામાં આવતાં રસ્તાઓના કે સિંચાઈ વગેરેના કામો માટે જ્યારે સાદી માટી (ઓર્ડીનરી ક્લે-અર્થ) અને (સોફ્ટ) મુરમ વાપરવામાં આવે ત્યારે ગુજરાત ગૌણ ખનિજ નિયમ, ૧૯૬૬ મુજબ રોયલ્ટી લેવાના નિયમો લાગુ પડશે નહીં. એટલે કે આ કામો માટે કોન્ટ્રાક્ટરો પાસે સાદી માટી (ઓર્ડીનરી ક્લે-અર્થ) અને (સોફ્ટ) મુરમ માટે રોયલ્ટી લેવાથી થશે નહીં તથા સંદર્ભે- (૪) હેઠળના વિભાગના તા. ૬/૧૧/૮૭ ના ઠરાવથી ગુજરાત વિદ્યુતબોર્ડ દ્વારા હાથ ધરવામાં આવતાં કામો માટે પણ ઉપર મુજબ રોયલ્ટી મુકિતનો લાભ આપવામાં આવેલ.

ઉપરોક્ત જોગવાઈના કારણે રાજ્યમાં ગેરકાયદેસર રીતે આ ખનીજોનો વપરાશ થતો હોવાનું જણાયેલ છે. જેના પરિણામે રાજ્ય સરકારે રોયલ્ટીની આવક ગુમાવવી પડે છે માટે ઉપરોક્ત હુકમોની જોગવાઈની સમીક્ષા કરી તે દૂર કરવાની બાબત સરકારશ્રીની વિચારણા હેઠળ હતી. તા. ૧૮/૬/૨૦૦૪ ના રોજ માન. મુખ્યમંત્રીશ્રીના અધ્યક્ષપણા હેઠળ

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાણી ઉજવેરની સહી :

યોજાપેલ એમ્પાવર્ડ કમીટીની બેઠકમાં નકકી થયા મુજબ સંદર્ભ-૩ તથા સંદર્ભ-૪ હેઠળના વિભાગના તા. ૨૫/૧/૮૧ તથા તા. ૬/૧૧/૮૭ ના ઠરાવો આથી રદ કરવામાં આવે છે.
ગુજરાતના રાજ્યપાલશ્રીના હુકમથી અને તેમના નામે.

(આર.બી.વ્યાસ)

નાયબ સચિવ

ઉદ્યોગ અને ખાણ વિભાગ

પ્રતિ,

- મા. મુખ્યમંત્રીશ્રીના અગ્રસચિવશ્રી, મા. મુખ્યમંત્રીશ્રીનું કાર્યાલય,
- રાજ્ય કક્ષાના મંત્રીશ્રી (ઉદ્યોગ અને ખાણ) ના અંગત સચિવશ્રી, સચિવાલય, ગાંધીનગર.
- અગ્રસચિવશ્રી, નાણાં વિભાગ, સચિવાલય, ગાંધીનગર
- અગ્રસચિવશ્રી, ઉર્જા અને પેટ્રોકેમીકલ વિભાગ, સચિવાલય, ગાંધીનગર
- અગ્રસચિવશ્રી, મહેસુલ વિભાગ, સચિવાલય, ગાંધીનગર
- અગ્રસચિવશ્રી, પંચાયત અને ગ્રામ ગૃહ નિર્મોણ વિભાગ, સચિવાલય, ગાંધીનગર
- સચિવશ્રી, નર્મદા અને જળ સંપત્તિ વિભાગ, સચિવાલય, ગાંધીનગર
- સચિવશ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
- મેનેજીંગ ડેરીક્ટરશ્રી, સરદાર સરોવર નર્મદા વિભાગ, સચિવાલય, ગાંધીનગર
- સભ્ય સચિવશ્રી, ગુજરાત વિધત બોર્ડ, રેસકોર્સ, વડોદરા
- સચિવાલયના સર્વે વિભાગો
- એકાઉન્ટન્ટ જનરલશ્રી અમદાવાદ / રાજકોટ.
- વિકાસ કમિશનરશ્રી, ગુજરાત રાજ્ય, ગાંધીનગર
- સર્વે મુખ્ય ઈજનેરશ્રીઓ
- કમિશનરશ્રી, ભુસ્તર વિજ્ઞાન અને ખનિજ ખાતું, ગાંધીનગર
- અધિક નિયામકશ્રી (એફ.એસ.) ભુસ્તર વિજ્ઞાન અને ખનિજ, ગાંધીનગર
- મુખ્ય વન સંરક્ષક શ્રી, ગુજરાત રાજ્ય, ગાંધીનગર
- કાયરેક્ટર એકાઉન્ટન્ટ એન્ડ ટ્રેઝરી, ગાંધીનગર
- રાજ્યના સર્વે ખાતાના વડાઓ
- સર્વે કલેક્ટરશ્રીઓ
- સિનિયર ભુસ્તરશાસ્ત્રીશ્રી ભુસ્તર વિજ્ઞાન અને ખનિજ અમદાવાદ, વડોદરા, રાજકોટ, ભુજ
- સર્વે પ્રાંત અધિકારીઓ.
- સર્વે મામલતદારશ્રીઓ / મહાલેખાકારશ્રીઓ
- સર્વે જિલ્લા વિકાસ અધિકારીશ્રીઓ.
- સર્વે તાલુકા વિકાસ અધિકારીશ્રીઓ.
- સર્વે અધિક્ષક ઈજનેરશ્રીઓ, જળસંપત્તિ વિભાગ, માર્ગ અને મકાન વિભાગ, નર્મદા વિભાગ.
- સર્વે કાર્યપાલક ઈજનેરશ્રીઓ જળ સંપત્તિ વિભાગ, માર્ગ અને મકાન વિભાગ, નર્મદા વિભાગ.
- સર્વે વન સંરક્ષકશ્રીઓ.
- સર્વે જિલ્લા ભુસ્તરશાસ્ત્રીશ્રી, કલેક્ટર કચેરી (ખનિજ શાખા)
- પે એન્ડ એકાઉન્ટન્ટ ઓફીસર, ગાંધીનગર / સિલેક્ટ ફાઈલ

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

પરિપત્ર :-

વિષય :- હોટ મીક્સ પ્લાન્ટ અને પેવર કીનીશરની તેમજ સાદી પધ્ધતિથી રસ્તા પર કરવાનાં કામર કામ ચાલુ રાખવા બાબત.

- સંદર્ભ :- (૧) સરકારશ્રીનો તા. ૨૯-૧૦-૮૭ નો સરખા ક્રમાંક નો પરિપત્ર
(૨) સરકારશ્રીનો તા. ૨૭-૦૯-૮૯ નો સરખા ક્રમાંકનો પરિપત્ર
(૩) સરકારશ્રીનો તા. ૦૧-૦૩-૯૦ નો સરખા ક્રમાંકનો પરિપત્ર

સરકારશ્રીનાં સંદર્ભમાં જણાવેલ પરિપત્રોની હોટમીક્સ પ્લાન્ટ અને પેવર કીનીશરથી હાથ ધરવાનાં કામો સંબંધમાં વિવિધ સુચનાઓ આપવામાં આવેલ છે. રસ્તા પર હાથ ધરવામાં આવતું કામર પાથરવાનું કામ બને ત્યાં સુધી પોમાસ પહેલા પુરું કરી દેવા જરૂરી છે. તેમજ આપુ કામ ચોમાસા દરમ્યાન હાથ ધરાય નહીં તે પણ અતિ જરૂરી છે. તેમ છતાં આવા કામો વણી જમ્યાએ તે પ્રમાણે બંધ કરવાને બદલે ચાલુ રાખવામાં આવે છે. તેવું સરકારશ્રીનાં ધ્યાન પર આવેલ છે. રસ્તા પર હોટ મીક્સ પેવર પધ્ધતિથી કે સાદી પધ્ધતિથી કામર પાથરવાનું કામ ૩૧મી-મે બાદ ચાલુ રાખવું નહીં તે વચ્ચે જરૂરી છે. આથી સર્વેને સુચનાં આપવામાં આવે છે કે રસ્તા પર કોઈપણ પધ્ધતિથી હાથ ધરવામાં આવતું કામર પાથરવાનું કામ ૩૧મી-મે બાદ ચાલુ રાખવું નહીં જો આ સમય બાદ કામ ચાલુ છે તેવું સરકારશ્રીનાં ધ્યાન પર આવશે તો તે અંગેની સઘળી જવાબદારી સંબંધિત અધિકૃત ઈજનેરશ્રી તેમજ કાર્યપાલક ઈજનેરશ્રીને રહેશે.

ખાસ કિસ્સામાં ૩૧-મે પછી કામર કામ ચાલુ રાખવાની જરૂરીયાત ઉભી થાય તેવા સંજોગોમાં સંબંધકર્તા અધિકૃત ઈજનેરશ્રીની મંજૂરી મેળવ્યા બાદ અધિકૃત ઈજનેરશ્રી સુચવે તેટલા સમય પુરતું ચાલુ રાખવું.

સહી/-
(સી. કે. પટેલ)
નાયબ સચિવ
માર્ગ અને મકાન વિભાગ

(ઠીકેદારશ્રીની સહી)

Signature of the Contractor :
ઠીકેદારશ્રીની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરશ્રીની સહી :

પરિપત્ર

- વિષય :- ઈજારદારને સોપવામાં આવેલ કામ અંગેની ગુણવત્તા જાળવવા અંગેની જવાબદારી બાબત
- સંદર્ભ :- સરકારશ્રીના તા. ૪-૧૧-૮૬ ના પરીપત્ર ક્રમાંક : એસ - ૪૦- ખતપ - ૫૦૭૩ / સી - ૬૨૦૭૪ / (૧૧૨) / સી

ઈજારદારને સોપવામાં આવેલ કામની ગુણવત્તા જાળવવાની ઈજારદારની પોતાની જવાબદારી રહે છે. તેથી સોપવામાં આવેલ કામ નિયત સ્પેશીફિકેશન પ્રમાણે જ થવું જોઈએ અને કોઈપણ ક્ષેત્રમાં કામ ઉતરતી કક્ષાનું હોવું જોઈએ નહીં તેમ છતાં જ્યારે પણ કામ ઉતરતી કક્ષાનું જોવા મળે ત્યારે વિભાગે તે કામ સ્વીકારવું જોઈએ નહીં અને કોન્ટ્રાક્ટર પાસેથી નબળું કામ દુર કરાવી સ્પેશીફિકેશન મુજબ નવું કામ કરાવવું, કોન્ટ્રાક્ટર જો નબળું કામ દુર ન કરે તો તે માટે વિભાગ નકકી કરે તે રકમ વસુલ કરી વિભાગે તે કામ કરાવી લેવું તથા કામમાં અનિયમીતતા અને ખરાબ કામગીરી માટે સરકારશ્રીના સંદર્ભમાં દર્શાવેલ પરિપત્રની જોગવાઈ મુજબ ઈજારદારને શિક્ષા કરવા અંગેની કામગીરી કરવા આથી સુચના આપવામાં આવે છે.

આ સુચનાનો ચુસ્તપણે પાલન થાય તે જોવા સંબંધિતોએ ખાસ કાળજી રાખવી

ગુજરાતના રાજ્યપાલશ્રીના હુકમથી અને તેમના નામે

(એ. જી. દોશી)

નાયબ સચિવ

માર્ગ અને મકાન વિભાગ,

પ્રતિ:-

- સર્વ અધિક્ષક ઈજનેરશ્રીઓ (મા.મ. વર્તુળ / પંચાયત મા.મ. વર્તુળ / ને. હા. વર્તુળ / પા. યો. વર્તુળ / આ. મા. યો. વર્તુળ / એકસ્પ્રેસ વે વર્તુળ / વિદ્યુત વર્તુળ સહીત
- સર્વ કાર્યપાલક ઈજનેરશ્રીઓ (ઉપરોક્ત વર્તુળ હેઠળના સર્વ વિભાગો)
- સર્વ પ્રોજેક્ટ શાખાઓ, મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર

સીલેક્ટ ફાઈલ - ૧૯૯૨

માર્ગ અને મકાન વિભાગ,
પરિપત્ર ક્રમાંક : એસ. એસ. આર. - ૧૦૯૯/આઈ.પી. - ૯૧/(૯)/સ,
૧૪/૨ સરદાર ભવન,
સચિવાલય, ગાંધીનગર,
તારીખ : ૨૬-૭-૧૯૯૯.

વિષય :- ડામરના પરીક્ષણોની ફીક્વન્સી તથા ડામરના સાર્ટડ ઉપર પરિસ્થિતિ બાબત.
સંદર્ભ :- તા. ૫-૧૦-૯૮ ની બેઠકમાં દક્ષિણ ગુજરાતનાં તાંત્રિક અધિકારી/કર્મચારીઓની રજૂઆત.

પરીપત્ર :

દક્ષિણ ગુજરાતના તાંત્રિક અધિકારીઓ/કર્મચારીઓને સ્થળ પર પડતી મુશ્કેલીની રજૂઆત ના અનુસંધાને હોટ મીસ પ્લાન્ટ અને પેવરથી કરવાના ડામર કામમાં ડામરના ટેસ્ટીંગ પડતી મુશ્કેલીઓ અને તે અંગેનાં સુચનોની બાબત સરકાર ક્ષીની વિચારણામાં હતી. આથી સર્વે હોટ મીસ પ્લાન્ટથી ડામર કામમાં પરીક્ષણ કરવા સ્થળ ઉપર યોગ્ય માળખાકીય સવલતો ઉપલબ્ધ કરવામાં આવે તો ડામર પરીક્ષણની કમગીરી ભેગીય કચેરીમાં/પ્લાન્ટ સાર્ટડ ઉપર થઈ શકે, તે માટે વિચારણા હાથ ધરવામાં આવેલ છે.

પ્રવર્તમાન પધ્ધતી મુજબ ડામરના કામના ટેન્ડરમાં ઈરજદાર પ્લાન્ટ પર ડામર લાવીને કામો કરવાની જોગવાઈ થયેલ હોઈ નવા ડામરનો ટેસ્ટ થયા બાદ જ ઉપયોગ કરવો જરૂરી બનેલું છે. આથી સર્વે સંબંધીતોને સુચના એ પાઠવવામાં આવે છે કે પ્લાન્ટ સાર્ટડ પર ડામરના પરીક્ષણની જોગવાઈ હવે પાછીથી ડામરના કામના ટેન્ડરનાં અવશ્ય રાખવાની રહેશે. વધુમાં સ્થળ પરની ટેસ્ટ કામગીરી માટે નું જ્ઞાન દરેક તાંત્રિક કર્મચારીને રહે તે માટે ડામરના પરીક્ષણની તાલીમ ગેરીને જુદીજુદી પ્રયોગશાળા તરફથી વિભાગના દરેક મદદનીશ ઈજનેર/અધિક્ષક ઈજનેર/નાયબ કાર્યપાલક ઈજનેર/કાર્યપાલક ઈજનેરએ પાળવાની રહેશે.

પ્લાન્ટ સાર્ટડ ઉપર ડામરનાં પરીક્ષણોનું રજીસ્ટર સંબંધિત લેટ્રિય ટેન્ડરમાં જોગવાઈ રાખવાની રહેશે.

- (૧) માળખાકીય સવલત :
સ્થળ ઉપર આશરે ૨૫ ચો.મી. ના લેટ્રિયની પાકા બાંધકામવાળી લેબોરેટરી જરૂરી પાણી તથા લાઈટની સુવિધા સહિત બનાવવાની રહેશે.
- (૨) સાધનોની સવલત :
ડામર કામના નીચે દર્શાવેલ જુદા જુદા પરીક્ષણો માટે તેની સામે દર્શાવેલ આઈએસ મુજબનાં સાધનો ઉપલબ્ધ કરાવવાના રહેશે.

| | |
|-----------------------------|---------------|
| (૧) પેનીટ્રેશન ટેસ્ટ | : આઈએસ - ૧૨૦૩ |
| (૨) સોફ્ટનીંગ પોઈન્ટ ટેસ્ટ | : આઈએસ - ૧૨૦૪ |
| (૩) ડક્ટીલીટી ટેસ્ટ | : આઈએસ - ૧૨૦૮ |
| (૪) વીસ્કોસિટી ટેસ્ટ | : આઈએસ - ૧૨૦૬ |
| (૫) સ્પેશીયલ ગ્રેવીટી ટેસ્ટ | : આઈએસ - ૧૨૦૨ |

ઉપરોક્ત સાધનો આઈ.એસ. પ્રમાણિક હોવા જોઈએ તેમજ તેને નિયમીત રીતે કેલીબ્રેટ કરાવી કાર્યરત હાલતમાં રાખવાનાં રહેશે.

(૩) પરીક્ષણોની સંખ્યા :

એમ. ઓ. એસ. ટી. સ્પેશીયલિઝેશન સેક્શન ૯૦૦ મુજબ ડામર કામોમાં કવોલીટી એફ બાઈન્ડરનાં ટેસ્ટીંગ સંખ્યા એજ રીકપાર્ડ દર્શાવેલ છે. તે જોતાં દર બે ટેન્ડર ટીઠ એક નમુનાના ત્રણ પરીક્ષણ પ્લાન્ટ સાર્ટડ ઉપર કરાવવાના રહેશે તદ્દુપરાંત હવે પાછીથી નીચેના ટેબલના સંદર્ભ-૩ અને ૪ માં દર્શાવ્યા પ્રમાણે પરીક્ષણો ગેરીમાં પણ કરાવવાના રહેશે.

Signature of the Contractor :
એન્ડ્રીયસની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

| આઈ. એસ. - ૧૨૦૧/૧૯૭૮ પરીક્ષણની સંખ્યા | | પરીક્ષણો કરવાની સુધારેલ સંખ્યા | |
|--------------------------------------|------------------|--------------------------------|------------------|
| ટેન્ડરની સંખ્યા | પરીક્ષણની સંખ્યા | ટેન્ડરની સંખ્યા | પરીક્ષણની સંખ્યા |
| ૧ | ૨ | ૩ | ૪ |
| ૧ | ૧ | ૧ થી ૧૦ | ૧ |
| ૨ થી ૧૫ | ૨ | ૧૧ થી ૨૦ | ૨ |
| ૧૬ થી ૫૦ | ૩ | ૨૦ થી ૫૦ | ૩ |
| ૫૧ થી ૧૫૦ | ૫ | ૫૧ થી ૧૦૦ | ૪ |
| | | બાકી દરેક ૫૦ ટેન્ડર દીક | ૧ |

ઉપર મુજબના કામરના સાઈઝ તેમજ કરાવવાની જોગવાઈ હવે પછીથી દરેક દરેક કામરના ટેન્ડરોમાં અવશ્ય રાખવાની રહેશે.

આ સુચનાઓમાં અમલ ચુસ્તપણે લાગુ તેવું દરેક દરેક મેનિય અધિકારીઓ એ અવશ્ય ધ્યાન રાખવું.

સી.એમ. ભટ્ટ
નાયબ સચિવ
માર્ગ અને મકાન વિભાગ.

પ્રતિ,
સર્વે કાર્યપાલક ઈજનેરશ્રીઓ, મા.મ. વર્તુળ/પંચાયત મા.મ. વર્તુળ એકસપ્રેસવે વર્તુળ/પા. યો. વર્તુળ સહિત.
સર્વે/પા. યો. વર્તુળ સહિત.
સર્વે કાર્યપાલક ઈજનેરશ્રીઓ, ઉપરોક્ત વર્તુળહસ્તકના સર્વવિભાગો.
સર્વતાંત્રિક અધિકારીશ્રીઓ, ના.કા.ઈ. શ્રીઓ સહિત, મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર.
સર્વ પ્રોજેક્ટ શાખાઓ (રરતાને લગતી)મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર.
સિલેક્ટ કાઈલ - ૧૯૯૯/સ-શાખા, મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર.

Signature of the Contractor :
એન્ડ્રીક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

વિષય : - રસ્તા, પુલો તથા મકાનોના બાંધકામની વિગતો તથા
સ્પેસીફિકેશન અંગેના કામના સ્થળ ઉપર બોર્ડ મુકવા બાબત

ગુજરાત સરકાર,
માર્ગ અને મકાન વિભાગ,
પરિપત્રક્રમાંક : ટીએનસી-૧૦૮૦-૨૪-સ
સચિવાલય, ગાંધીનગર.
તારીખ : ૧૭-૦૮-૨૦૦૨

- સંદર્ભ :-**
- (૧) જા.બાં.વિ.નો પરિપત્રક્રમાંક : બીડીજી - ૩૨૭૭ - (૧૬૫) ન તા.૨૬-૪-૭૮.
 - (૨) મા.મ.વિ.ના ઠરાવક્રમાંક : ટીએનસી - ૧૦૮૦ - ૨૪ - સ.
 - (૩) મા.મ.વિ.ના ઠરાવક્રમાંક : ટીએનસી - ૧૦૮૦ - ૨૪ - સ તા. ૧૮/૧૧/૮૧.
 - (૪) મા.મ.વિ.ના ઠરાવક્રમાંક : ટીએનસી - ૧૦૮૦ - ૨૪ - સ તા. ૨૨/૭/૮૮.

પરિપત્ર :-

માર્ગ અને મકાન વિભાગના સંદર્ભ હેઠળના ઠરાવો/ પરિપત્રથી રસ્તા, પુલો તથા મકાનોના કામોના વર્ક ઓર્ડર આપ્યા બાદ તુર્તજ કામના સ્થળે કામની વિગત દર્શાવતું બોર્ડ ઈજારદારશ્રીના સ્વખર્ચે મુકવાની સુચના આપવામાં આવેલ છે. તા. ૧૮/૧૧/૮૧ ના અનુસાર આ બોર્ડ મુકવાની શરત ટેન્ડરના ભાગ તરીકે ગણવા પણ ઠરાવવામાં આવેલ છે.

આમ છતાં સરકારશ્રીના ધ્યાન ઉપર આવેલ છે કે, ઉપરોક્ત સુચનાઓનું ચુસ્તપણે અમલ કરવામાં આવતો નથી. જે યોગ્ય ન હોઈ આથી આપના કાર્યભેત્રના રૂા. ૫.૦૦ લાખથી વધારે અંદાજી કિંમતના કામો પર સંદર્ભિત સુચનાઓનો ચુસ્તપણે અમલ થાય તેની દરેક અધિક ઈજનેરશ્રી / કાર્યપાલક ઈજનેરશ્રી / નાયબ કાર્યપાલક ઈજનેરશ્રીને સુચના આપવામાં આવે છે.

કામની વિગતો નમુનો આ સાથેના પરિશિષ્ટમાં દર્શાવેલ છે.

ઉપરોક્ત સુચનાઓનો અમલ ચુસ્તપણે થાય તેની કાળજી રાખવાની રહેશે.

બિડાણ :- પરિશિષ્ટ

(ચ. મ. ભટ્ટ)

ઉપસચિવ
માર્ગ અને મકાન વિભાગ

-: પરિશિષ્ટ :-

માર્ગ અને મકાન વિભાગ હેઠળના રૂા. ૫.૦૦ લાખથી વધારે કિંમતના રસ્તા/ પુલો મકાનોના કામો ઉપર કામની વિગત દર્શાવતા બોર્ડ

- | | |
|-------------------------------|---|
| ૧) કામનું નામ (કામનો પ્રકાર) | : |
| ૨) વિભાગનું નામ | : |
| ૩) પેટાવિભાગનું નામ | : |
| ૪) ટેન્ડરની રકમ | : |
| ૫) ઈજારદારશ્રીનું નામ | : |
| ૬) સુપરવાઈઝરી સ્ટાફનાં નામ | : |
| ૭) કામ શરૂ કરવાની તારીખ | : |
| ૮) કામ પુરૂ કરવાની તારીખ | : |
| ૯) કામના સ્પેસીફિકેશન | : |

- ❖ માટી કામની જાડાઈ સે.મી.
- ❖ મેટલના પ્રથમ સ્તરની જાડાઈ.....સે.મી.
- ❖ મેટલના બીજા સ્તરની જાડાઈ.....સે.મી.
- ❖ ડામરની સપાટીનું કામ સે.મી.
(-----કપચી----- શ્રીટ અને ----- ડામર વાપરવાનો)
- ❖ ડામરની સીલીંગ સરફેસનું કામ સે.મી.
(-----કપચી----- શ્રીટ અને ----- ડામર વાપરવાનો)

પુલનાં કામો :-

- પુલના લંબાઈના ગાળા
- પુલના પાયાના કોન્ક્રીટનું પ્રમાણ (સીમેન્ટ, કપચી, રેતી)
- પુલના થાંભલા/ એબટમેન્ટના કોન્ક્રીટનું પ્રમાણ (સીમેન્ટ, કપચી, રેતી)
- સુપરસ્ટ્રક્ચરના કોન્ક્રીટનું પ્રમાણ (સીમેન્ટ, કપચી, રેતી)
- અન્ય વિશેષ જોગવાઈ.

મકાનોના કામો :-

- પાયાના કોન્ક્રીટનું પ્રમાણ (સીમેન્ટ, કપચી, રેતી)
- ઈંટોના ચણતરમાં સીમેન્ટ / રેતીનું પ્રમાણ (સીમેન્ટ, રેતી)
- ભોંયતળીયાના કોન્ક્રીટનું પ્રમાણ (સીમેન્ટ, કપચી, રેતી)
- ભોંયતળીયે સે.મી. જાડાઈની સાઈઝની મોઝેક ટાઈલ્સ.
- બારી બારણા સાગી લાકડાના/ સ્ટીલ ફ્રેમ / અન્ય

આર.સી.સી. કામો :-

- આર. સી. સી. કામમાં કોન્ક્રીટનું પ્રમાણ (સીમેન્ટ, કપચી, રેતી)
- આ કામના વિગતવાર સ્પેસીફિકેશન નામબ કાર્યપાલક ઈજનેરશ્રી પેટા વિભાગની કચેરીએ ઓફીસના સમય દરમ્યાન કોઈપણ સમયે જોઈ શકાશે.
- આ કામની માલિકી જાહેર જનતાની છે અને કામમાં ભાતિ કે અનિયમિતતા જણાય તો તે બાબતમાં સંબંધિત અધિક્ષક ઈજનેરશ્રી વતું જ કે જેઓની કચેરી સ્થળે છે તેઓનું ધ્યાન દોરવા વિનંતી છે.

હોટમીસ પ્લાન્ટ અને પેવરથી ધતા ડામર કામો અંગે

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
પરિપત્ર ક્રમાંક : એસએસઆર-૧૫૮૬-આઈબી-૧૭૯(૬)-સ,
૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
તા. ૨૦-૦૧-૨૦૦૭

વંચાણે લીધા :- તા. ૨૮-૧૦-૧૯૮૬ નો સમાનાંકી પત્ર

પરિપત્ર :-

હોટમીસ પ્લાન્ટ અને પેવરથી ડામર કામો અંગે તા. ૨૮-૧૦-૧૯૮૬ ના સમાનાંકી પરિપત્રથી આપેલ સૂચનાઓમાં ફેરફાર કરવા ગુજરાત કોન્ટ્રાક્ટર એસોસિએશન તરફથી નીચે મુજબની રજૂઆત થયેલ.

- (૧) પ્લાન્ટ ચલાવવાનો સમય જે સવારના ૮.૦૦ વાગ્યાથી ૪.૦૦ વાગ્યા સુધીનો છે તે સમયમાં વધારો કરવો.
- (૨) હોટ મીસ પ્લાન્ટનો અમલ થયો ત્યારે ૨૫૦ ટન / દિસનો નિયમ હતો તે દુર કરવો.

૨. તા. ૨૮-૧૦-૧૯૮૬ ના સમાનાંકી પરિપત્રથી આપેલ સૂચનાઓને ઘણોજ સમયગાળો પસાર થયેલ છે. હાલની પરિસ્થિતિમાં હવે ઈજારદારશ્રીઓ દ્વારા અદ્યતન મશીનરીનો ઉપયોગ કરવામાં આવે છે. તેથી કામગીરી ઝડપથી સારી રીતે થઈ શકે તે હેતુસર સદરહુ કરાવની સુચના રદ ગણી ઉપરોક્ત બંને બાબતે સંબંધિત કાર્યપાલક ઈજનેરશ્રી પ્લાન્ટ સાર્ઈડ, પ્લાન્ટની ઉત્પાદન ક્ષમતા, કામની સ્થળ સ્થિતિ, વાતાવરણની પરિસ્થિતિ તથા અન્ય અસરકર્તા બાબતો ધ્યાને લઈને કામની ગુણવત્તાને નુકશાન ન થાય તે રીતે નિર્ણય લેવા સજ્જમ ગણવા નક્કી કરવામાં આવેલ છે. તેથી હવે પછી તેને અનુસરવા સર્વેને જણાવવામાં આવે છે.

સહી/-
(અશોક પંડ્યા)
ઉપસચિવ
માર્ગ અને મકાન વિભાગ

પ્રતિ,

- સર્વે અધિષ્ઠ ઈજનેરશ્રીઓ, રાજ્ય તથા પંચાયત (મા.મ.) વર્તુળ.
- સર્વે કાર્યપાલક ઈજનેરશ્રીઓ, રાજ્ય તથા પંચાયત (મા.મ.) વિભાગો,
- સર્વે તાંત્રિક અધિકારીઓ, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
- સર્વે તાંત્રિક શાખાઓ, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર

નકલ રવાના :- સર્વે મુખ્ય ઈજનેર અને સંબુક્ત સચિવશ્રીના અંગત મદદનીશશ્રીઓ.
સીલેક્ટ ફાઈલ.

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

મશીન ક્રશ્ડ સ્ટોન એગ્રીગેટના ફલેકીનેશ
અને ઈલોન્ગેશન ઈન્ડેક્સના સંયુક્ત ધોરણો
અપનાવવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
પરિપત્ર ક્રમાંક : એસઓઆર-૧૦૨૦૦૬/૧૦૪/સ.૧
સચિવાલય, ગાંધીનગર
તા. ૨૫-૦૧-૨૦૦૭

પ્રસ્તાવના :-

'મશીન ક્રશ્ડ સ્ટોન એગ્રીગેટ' એ આંધકામમાં વપરાતું મુખ્ય મટીરીયલ છે. આ 'મટીરીયલ્સ' માટેના ગુણવત્તાના વિવિધ ધોરણો પૈકીનો એક 'ફલેકીનેશ અને ઈલોન્ગેશન ઈન્ડેક્સ (સંયુક્ત)' છે. જે મીનીસ્ટ્રી ઓફ રોડ ટ્રાન્સપોર્ટ અને હાઉસિંગ (MORT&H) દ્વારા પ્રકાશિત સ્પેશીકીકેશન ફોર રોડ એન્ડ બ્રીજ વર્કની ચોથી આવૃત્તિમાં દર્શાવ્યા અનુસાર ૩૦% થી વધુ ન હોવો જોઈએ. જ્યારે અગાઉ મીનીસ્ટ્રી ઓફ સરકેઈસ ટ્રાન્સપોર્ટની બીજી આવૃત્તિમાં ફક્ત ફલેકીનેશ ઈન્ડેક્સનું ધોરણ વધુમાં વધુ ૩૫% સુધીનું હતું. આમ સંશોધનો / અનુભવ તેમજ અદ્યતન મશીનરીની ઉપલબ્ધીનો વ્યાપ / સરળતા તેમજ આર્થિક પાસાઓને ધ્યાને લઈને ગુણવત્તાના ધોરણોમાં પણ નવા સુધારા / વધારા કરવામાં આવે છે. અગાઉના ફલેકીનેશ ઈન્ડેક્સના ધોરણોમાં હવે ઈલોન્ગેશન ઈન્ડેક્સ પણ જોડી સંયુક્ત ધોરણ દાખલ કરવામાં આવેલ છે. પરંતુ હાલ ગુજરાત રાજ્યમાં આવેલ ક્રશર યુનિટો પૈકીના મોટા ભાગના યુનિટો પરંપરાગત પદ્ધતિથી કાર્યરત છે. તેમાંથી નવા સંયુક્ત ધોરણો પરિપૂર્ણ કરે તેવો ઉત્પાતિ માલ મળી શકતો નથી, જે એક વ્યવહારિક મુશ્કેલી છે. પરંપરાગત પદ્ધતિના ક્રશરમાં આ પ્રકારની મુશ્કેલીઓ આવે છે. તે બાબતો ઉલ્લેખ ટેકનીકલ જર્નલમાં પ્રસિધ્ધ થતા ટેકનીકલ પેપર્સમાં પણ થયેલ છે. આથી સંયુક્ત ધોરણો મેળવવા હાલના ક્રશર યુનિટોમાં સારા એવા પ્રમાણમાં સુધારા વધારા કરવા આવશ્યક બને તેમ છે. જેમાં વધારાનું નાણાકીય રોકાણ પણ કરવું પડે તેમજ સમય પણ વ્યતિત થાય આથી ફલેકીનેશ તેમજ ઈલોન્ગેશન ઈન્ડેક્સના સંયુક્ત ધોરણોનો અમલ કરવા (ઈજારદારોને) પુરતો સમય આપવો પણ જરૂરી છે. તે ધ્યાને લઈ નીચે મુજબની સુચનાઓ આપવામાં આવે છે.

મીનીસ્ટ્રી ઓફ રોડ ટ્રાન્સપોર્ટ એન્ડ હાઉસિંગ દ્વારા પ્રકાશિત સ્પેશીકીકેશન ફોર રોડ એન્ડ બ્રીજ વર્કની સને ૨૦૦૧ ની ચોથી આવૃત્તિ અનુસાર મશીન ક્રશ્ડ સ્ટોન એગ્રીગેટ માટે ફલેકીનેશ તેમજ ઈલોન્ગેશન સંયુક્ત ઈન્ડેક્સની મહત્તમ ૩૦% ની મર્યાદાનું ધોરણ અપનાવવાનું નક્કી કરવામાં આવેલ છે.

માર્ગ અને મકાન વિભાગ હસ્તક ચાલતા કામોમાં પ્રવર્તમાન સ્પેશીકીકેશન પ્રમાણે ફલેકીનેશ અને ઈલોન્ગેશનના સંયુક્ત ઈન્ડેક્સની મહત્તમ મર્યાદા ૩૦% રાખવામાં આવે છે.

ગુજરાત રાજ્યમાં મોટા ભાગના ક્રશીંગ યુનિટો ખાનગી માલિકીના છે અને તેમાં જરૂરી પાત્રિક કેરકારો કરવામાં આવે તો સંયુક્ત ઈન્ડેક્સના ધારા ધોરણો જળવાઈ રહે તેવો માલ મળી શકે.

ગુજરાત રાજ્યમાં ચાલતા ખાનગી ક્રશીંગ મશીનોમાં જરૂરી પાત્રિક સુધારા વધારા તા. ૩૦-૦૯-૦૭ સુધીમાં કરવામાં આવે તો જ તા. ૦૧-૧૦-૦૭ પછીથી માર્ગ અને મકાન વિભાગના રસ્તાઓમાં વપરાતા એગ્રીગેટની ગુણવત્તા ધારા ધોરણ મુજબની મળી રહે. આથી નીચે મુજબની સુચનાઓ આપવામાં આવે છે.

(અ) માર્ગ અને મકાન વિભાગમાં ચાલતા કામોમાં ઈજારદારોએ જે તે ક્રશીંગ યુનિટોમાં જરૂરી પાત્રિક સુધારા-વધારા થઈ ગયેલ છે અને ધારા ધોરણ મુજબની ગુણવત્તાનો એગ્રીગેટ મળી રહે છે તેવું પ્રમાણપત્ર અધિક્ષક ઈજનેરશ્રી (પાત્રિક) અમદાવાદ મા.મ.વર્તુળ, અમદાવાદનું હોય તેની પાસેથી જ માલસામાન ખરીદ કરવાનો રહેશે. આ પ્રમાણિત થયેલ ક્રશીંગ યુનિટ સિવાયના કોઈપણ ક્રશર પાસેથી માલસામાન સપ્લાય ન થાય તેની કાળજી લેવાની રહેશે. અ.ઈ.શી (પાત્રિક) દ્વારા સર્ટીફિકેટ ન થયેલ ક્રશીંગ યુનિટ પાસેથી આવેલ ધારા ધોરણ વગરનો માલ સામાન આઉટ રાઉટ રીજેક્ટ કરવામાં આવશે.

(બ) માર્ગ અને મકાન વિભાગના એસ.ઓ.આર. માં તથા અંદાજોમાં એગ્રીગેટના ભાવમાં જરૂરી સુધારા લઘારા કરીને તા. ૦૧-૧૦-૦૭ થી અમલમાં લાવવાના રહેશે.

(ક) દરેક વિભાગીય કચેરીઓએ તેઓના તાબામાં જે જે ઈજારદારોની નોંધણી થયેલ છે તેઓને સદરહુ સુચનાનો અમલ કરવા માટે લેખીત જાણ કરવાની રહેશે તથા ખાનગી ક્રશીંગ યુનિટોને પણ આની લેખીત જાણ કરવાની રહેશે. સદરહુ સુચનાના અમલ માટે ખાનગી ક્રશર યુનિટો તેમજ ઈજારદારો સાથે દરેક વિભાગીય કચેરીએ એક સંયુક્ત બેઠક કરીને સમજ આપવાની રહેશે. જેથી તા. ૦૧-૧૦-૦૭ પછી માર્ગ અને મકાન વિભાગ હસ્તક ચાલતા કોઈપણ કામોમાં ધારા ધોરણ મુજબની ગુણવત્તા સિવાયનો માલસામાન વાપરવામાં ન આવે તેની તકેદારી રાખવાની રહેશે.

ઉપરોક્ત સુચનાઓનો અમલ ચુસ્તપણે કરવાનો રહેશે.

(એસ.એ.ભટ્ટ)
ઉપસચિવશ્રી,
માર્ગ અને મકાન વિભાગ

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

વર્તુળ કચેરી હસ્તકના રૂા.૧ કોડથી વધુ રકમના
વાઈડનીંગ અને સ્ટ્રેન્ધીંગના કામોમાં
કોમ્પેક્શન ની કામગીરી અંગેની સુચનાઓ

પરિપત્ર ક્રમાંક :- એસ.ઓ.આર. : ૧૦.૨૦૦૮-૨૦૦૮-૧૮-સી.

માર્ગ અને મકાન વિભાગ

સચિવાલય, ગાંધીનગર

તા. ૧૩-૧૦-૨૦૦૭

-:: પરિપત્ર ::-

વર્તુળ કચેરી હસ્તકના રૂા.૧ કોડથી વધુ રકમના વાઈડનીંગ અને સ્ટ્રેન્ધીંગ ના કામોમાં કોમ્પેક્શનની જે કામગીરી કરવામાં આવે છે, તેમાં દરેક સ્તરનું કોમ્પેક્શન વ્યવસ્થિત થાય તે જરૂરી છે. આ કામગીરીની ચકાસણી દરેક લેવર ફરજીયાત પછે ડેન્સીટી મીટર થી ચીક પ્રમાણે ઈજારદારશ્રી પાસેથી તેવાર કરાવીને મેળવવાની રહેશે. જેની ચકાસણી સંબંધિત નામળ કાર્યપાલક ઈજનેર અને મદદનીશ / અધિક મદદનીશ ઈજનેરશ્રીએ પણ કરવાની રહેશે. હાથ ધરાય તે જોવાની આથી સુચના આપવામાં આવે છે.

ઈજારદારશ્રીને તેમણે કરેલ કામગીરી અંગે જ્યારે પણ બિલની ચુકવણી કરવાની થાય ત્યારે ઉપરોક્ત સુચવેલ પંધ્યતિ પ્રમાણે જે કામ કરવામાં આવેલ છે. (કેમ કે ?) તેની ખરાઈ દરેક અધિક ઈજનેરશ્રી પાસે કરાવ્યા બાદ જ બિલનું ચુકવણું કરવાનું રહેશે.

રૂા. ૧ કોડથી ઉપરના દરેક કામોમાં સાર્ટ ઓફ ઈજારદારશ્રીનો એન્જીનિયર ફરજીયાત પછે હોવો જોઈએ અને અન ઈજનેર નું ઓળખપત્ર પણ ઈજારદારશ્રીએ આપવાનું રહેશે. અને આ ઓળખપત્ર ની એક નકલ સંબંધિત અધિક ઈજનેરશ્રીની કચેરીમાં રાખવાની રહેશે. જો ઈજારદારશ્રીનો ઈજનેર સાર્ટ ઓફ ઈજારદારશ્રી ન રહેતો હોય તો ઈજારદારશ્રીને જરૂરી નોટીસ પાઠવવાની રહેશે. અને આમ છતાં પણ ઈજારદારશ્રી સાર્ટ ઓફ ઈજનેર ન મૂકે તો કરવાની હોય અને હયાત કેરેજવેની સ્ટ્રેન્ધીંગની કામગીરી કરવાની હોય ત્યારે ઈજારદાર વાઈડનીંગની પહોળાઈમાં ધારા ધોરણ મુજબ ના કોમ્પેક્શન માટે બેબી રોલર લાવવું ફરજીયાત રહેશે. અને ઉપર જણાવ્યા પ્રમાણેની ચકાસણી પણ કરવાની રહેશે.

નવા ડીટીપી મંજૂર થાય તેમા ઉપર મુજબની શરત ખાસ મુકવા તેમજ હાલ જે કામો પ્રગતિ હેઠળ છે. તેમાં પણ, ઉપરોક્ત સુચનાઓ મુજબ ફરજીયાતપણે કાર્યવાહી કરવા આથી સુચના આપવામાં આવે છે.

(આર. કે. ચૌહાણ)

ખાસ ફરજ પરના અધિકારી (એસ.પી.)

માર્ગ અને મકાન વિભાગ.

પ્રતિ, :-

- સર્વે મુખ્ય ઈજનેર અને અધિક સચિવશ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
- સર્વે ઉપસચિવશ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
- સર્વે અધિક ઈજનેરશ્રી માર્ગ અને મકાન વર્તુળ / પંચાયત માર્ગ અને મકાન વર્તુળ / નેશનલ હાઈવે વર્તુળ / પાટનગર યોજના (માર્ગ અને મકાન) વર્તુળ / આલેખન (માર્ગ અને મકાન) વર્તુળ / રાજ્ય માર્ગ યોજના વર્તુળ સહિત.
- સર્વે કાર્યપાલક ઈજનેરશ્રી માર્ગ અને મકાન વર્તુળ / પંચાયત માર્ગ અને મકાન વર્તુળ / ને.હા. વર્તુળ / પા.યો. માર્ગ અને મકાન વર્તુળ.

Signature of the Contractor :
એન્ડ્રીકસરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

બાંધકામના મટીરીયલ્સ તેમજ કોમ્પોનેન્ટ્સ સેમ્પલની ગુણવત્તા માટેના પરીક્ષણ પૈકીના ૮૦% પરીક્ષણ સ્થળ પર તથા ૧૦% પરીક્ષણ સરકાર માન્ય લેબોરેટરી / ગેરી ધ્વારા તથા ૧૦% ગેરી લેબોરેટરીમાં કરાવવા બાબત.

ગુજરાત સરકાર,
માર્ગ અને મકાન વિભાગ,
પરિપત્ર ક્રમાંક :- ૫૨૪ / ૧૦૨૦૦૭/૨૮ સ
સચિવાલય, ગાંધીનગર.
તારીખ : ૩૧/૧૨/૨૦૦૯

પરિપત્ર

બાંધકામના મટીરીયલ્સ તેમજ કોમ્પોનેન્ટ્સના સેમ્પલની ગુણવત્તા માટેના પરીક્ષણ હાલ ગેરી કે સરકાર માન્ય સંસ્થા (લેબોરેટરી) મારફતે કરવામાં આવે છે. કામોની પ્રગતિની સમીક્ષા દરમ્યાન ક્ષેત્રીય અધિકારીઓ તરફથી જાણવા મળેલ છે કે ઉક્ત હયાત પ્રક્રિયામાં ટેસ્ટીંગના પરીણામો વિલંબથી મળે છે. જેમાં સમય પણ ખૂબ વ્યતિત થાય છે. ઈજારદાર એસોસીયેશન તરફથી આવી રજૂઆતો મળે છે. આથી આ મુશ્કેલી ધ્યાને લેતા ઈજારદારશ્રી ધ્વારા જે તે કામ માટે સ્થાપવામાં આવતી લેબોરેટરીમાં સ્થળ પર જ પરીક્ષણ કરવામાં આવે તો વિલંબ નિવારી શકાય તે બાબત વિચારણા હેઠળ હતી. પુખ્ત વિચારણાના અંતે નીચે મુજબની નીતિ હાલના તબક્કે અનુસરવા નક્કી કરવામાં આવ્યું છે.

નીચે જણાવેલ પરીક્ષણોમાં પ્રવર્તમાન પદ્ધતિમાં ફેરફાર કરી ફીક્વન્સી અનુસાર જરૂરી પરીક્ષણો પૈકી ૧૦% સરકાર માન્ય લેબોરેટરી / ગેરી તથા ૧૦% ગેરી લેબોરેટરી અને ૮૦% ફીલ્ડ લેબોરેટરી ધ્વારા કરાવવાના રહેશે. પરંતુ ગેરીમાં નીચેના દરેક પૈકી ઓછામાં ઓછું ૧ (એક) પરીક્ષણ ગેરી લેબોરેટરીમાં કરવાનું રહેશે. તથા ઓછામાં ઓછું એક પરીક્ષણ ગેરી / સરકાર માન્ય લેબોરેટરીમાં કરાવવાનો રહેશે. જેમાં નીચે દર્શાવેલ પરીક્ષણો સ્થળ પર કરવાના રહે છે.

| | | |
|----|---------------------|--|
| એ | એગ્રીગેટ | (૧) ગ્રેડેશન (૨) ફ્લેકીનેશ અને ઈલોગેશન વેલ્યુ (૩) ઈમ્પક્ટ વેલ્યુ (૪) વોટર અબસોર્પશન |
| બી | માટી | (૧) ફિલ્ડ એફડીડી અને એફએમસી (૨) સીવ એનાલીસીસ |
| સી | રેતી | (૧) ગ્રેડેશન |
| ડી | ઈટો | (૧) ડાયમેનશન અને ટોલરન્સ ટેસ્ટ (૨) વોટર અબસોર્પશન |
| ઈ | કોંક્રીટ | (૧) નોન ડીસ્ટ્રીક્ટીવ ટેસ્ટ (એલ્ટ્રા સોનીક ટેસ્ટીંગ પદ્ધતિથી) (૨) સ્લમ્પ ટેસ્ટ (૩) કોમ્પ્રેસીવ સ્ટ્રેન્થ |
| એફ | બીટ્યુમીનસ મીક્સ | (૧) ડામરની ટકાવારી |
| જી | ડ્રાય મીક્સ મટીરીયલ | (૧) ગ્રેડેશન |

શરતો :-

- (૧) ઈજારદારે કામની ગુણવત્તા માટે ધારા ધોરણ પ્રમાણેની અને ઉપર જણાવેલ પરીક્ષણો માટે પ્રમાણિત થયેલ જરૂરી તમામ સાધનો સહિતની ફિલ્ડ ટેસ્ટીંગ લેબોરેટરી સ્વ ખર્ચે કામના સ્થળે યોગ્ય જગ્યા ઉપર સ્થાપવાની રહેશે. રસ્તાના કામ માટે લાગુ પડતા પ્લાન્ટના સ્થળને કામનું સ્થળ ગણી શકાય પરંતુ કામનું સ્થળ લેબોરેટરીથી દૂર હોય તો ઈજારદારશ્રી ધ્વારા મોબાઈલ લેબોરેટરીની જરૂરી વ્યવસ્થા રાખવાની રહેશે.

Signature of the Contractor :
એન્જીનેરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

- (૨) કા.ઈ.શ્રી. જ્યારે સ્થળ પર તેઓનું ચેકીંગ કરવા જાય ત્યારે ટેસ્ટીંગ તેઓએ તેમની રૂબરૂમાં પણ સાવવાનું રહેશે.
- (૩) ધારા ધોરણ પ્રમાણેના પરીક્ષણોની સંખ્યા પૈકી ૮૦% પરીક્ષણ ફિલ્ડ લેબોરેટરીમાં ઈજારદારના અધિકૃત ક્વોલીફાઈડ ઈજનેર કે જેઓને સંબંધિત કાર્યપાલક ઈજનેરશ્રી એ આઈકાર્ડ આપેલ હોય તેમના ધ્વારા ખાતાના ના.કા.ઈ./મ.ઈ./અ.મ.ઈ./ ની હાજરીમાં જ કરવાના રહેશે. અને પરિણામોમાં સંયુક્ત સહીઓ કરવાની રહેશે. જ્યારે ૧૦% પરિક્ષણ ગેરી / સરકાર માન્ય લેબોરેટરી (ઓછામાં ઓછું એક પરીક્ષણ) અને ૧૦% ગેરી લેબોરેટરી (ઓછામાં ઓછું એક પરીક્ષણ) અને ૧૦% ગેરી લેબોરેટરી (ઓછામાં ઓછું એક પરીક્ષણ) મારફતે કરાવવાના રહેશે.
- (૪) કુલ પરીક્ષણોના ૮૦% પરિક્ષણ એક જ સ્થળે એકજ સમયે એકજ તબક્કામાં નહીં કરતાં કામની પ્રગતિ મુજબ જે તબક્કાએ જે તે કામગીરીને અનુરૂપ જે મટીરીયલ્સ વાપરવાનું થતું હોય તદાનુસાર શરૂઆતના તબક્કામાં રાખવું વચ્ચેના તબક્કામાં તેમજ આખરી તબક્કામાં કરાવવાનું રહેશે. આમ છતાં આ બાબતે સ્થાનિક કક્ષાએથી ના.કા.ઈ.શ્રીએ જરૂરીયાત મુજબ તબક્કાવાર પરીક્ષણો નક્કી કરવાના રહેશે.
- (૫) ગુણવત્તા નિયમન ધારા ધોરણ પ્રમાણેના બધા જ રજીસ્ટર નિયમીત રીતે નિભાવવાના રહેશે, અને તે જે તે સ્થળે લેબોરેટરીમાં ઉપલબ્ધ રહે તેમ રાખવાના રહેશે.
- (૬) જો કોઈ કારણસર ટેસ્ટીંગ સાધન અપ્રાપ્ય હોય અથવા વસાવવામાં સમય જાય તેમ હોય કે વ્યવહારુ ન હોય (જેમ કે ઈલેક્ટ્રોનિક બેરીંગ) તો આવા પરીક્ષણો ગેરી / સરકાર માન્ય સંસ્થાઓમાં કરાવી શકાશે અને આ બાબતનો નિર્ણય સંબંધિત કા.ઈ.શ્રી/ના.કા.ઈ.શ્રીએ કરવાનો રહેશે. ગેરીમાં ન થઈ શકે તેવા ટેસ્ટ ટેસ્ટ સરકાર માન્ય લેબોરેટરીમાં કરાવી શકાય.
- (૭) વિભાગના ક્ષેત્રીય તાંત્રિક સ્ટાફ ના.કા.ઈ. / મ.ઈ./અ.મ.ઈ. એ તેમજ ઈજારદારના તાંત્રિક સ્ટાફ ધ્વારા ગેરીમાં પરીક્ષણ જાતે કરવાનો સંતોષકારક અનુભવ મેળવી આ બાબતનું ગેરીનું પ્રમાણપત્ર પણ મેળવવાનું રહેશે. જે તે જિલ્લા / પ્રાદેશીક સ્તરે ગેરીની લેબોરેટરીમાં કોર્પ કન્ડક્ટ કરવા માટે જરૂરી હી જે તે વિભાગના કા.ઈ.શ્રીએ ચુકવવાની રહેશે અને આ કાર્યવાહી સમયબદ્ધ પૂર્ણ થાય તે માટે સંબંધિત અ.ઈ.શ્રીએ આ કામગીરીની વખતોવખત સમીક્ષા કરવાની રહેશે.
- (૮) આ પરીપત્રથી ઉપર જણાવેલા પરીક્ષણો પૈકી ૮૦% પરીક્ષણો ક્ષેત્રીય લેબોરેટરીમાં કરવાનો સમય તા. ૧/૧/૨૦૧૦ થી કરવાનો રહેશે.
- (૯) ગેરીમાં ટેસ્ટીંગ કરાવતાં સમયે ગેરીનો ટેસ્ટીંગ સાઈ ત્વરીત ભરવાનો રહેશે. જેથી પરીક્ષણના પરીણામો સમયસર મેળવી શકાય.

(આર.કે.ચૌહાણ)

ખાસ ફરજ પરના અધિકારી (વિ.યો.)

માર્ગ અને મકાન વિભાગ.

પ્રતિ,

- (૧) માન.મંત્રીશ્રી (મા.મ.) વિભાગના અંગત સચિવશ્રીની જાણ સારું.
- (૨) મુ.ઈ.શ્રી (મા.મ.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- (૩) મુ.ઈ.શ્રી. (પંચા) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- (૪) મુ.ઈ.શ્રી. (ને.હા.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- (૫) મુ.ઈ.શ્રી. (પા.યો.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- (૬) મુ.ઈ.શ્રી. (ગુ.નિ.) અને અ.સ.શ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર.
- (૭) નિયામકશ્રી (એસટીસી) સ્ટાફ ટ્રેનીંગ કોલેજ, ગાંધીનગર.

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ

પરિપત્ર ક્રમાંક : પરચ-૧૦૨૦૦૫-૩૩-ભાગ-૨-સી
સચિવાલય ગાંધીનગર
તા. ૧૮/૦૯/૨૦૧૦

વિષય :- બાંધકામોમાં વપરાતા માલસામાનના પરિશિષ્ટો માટે ખાનગી લેબોરેટરીઓને
આપેલ માન્યતા બાબત.
સંદર્ભ :- નડીયાદ મા.મ. વિભાગનો તા. ૧૮/૦૧/૨૦૧૦ ના પત્રો ક. એબી- ટેન્ડર
-૩૦૩ થી એબ-ટેન્ડર-૩૨૨

પરિપત્ર :

ઉપરોક્ત વિષયે સંદર્ભ હેઠળના પત્રથી માન્યતા આપેલ ખાનગી લેબોરેટરીઓમાં બધી લેબોરેટરીમાં ટેસ્ટીંગ
ઘઈ શકે તે માટે આજ્ઞાનુસાર નીચે મુજબ સુચના આપવામાં આવે છે.

" માન્ય ખાનગી લેબોરેટરીમાં પરીક્ષણો કરાવવામાં આવે ત્યારે એક જ વિભાગીય કચેરી હેઠળના એક કે બધા
કામના પરિશિષ્ટો એકજ ખાનગી લેબોરેટરીમાં ન થાય તે જોવું અને સૌથી નજીકની એક થી વધુ માન્ય લેબોરેટરીમાં
રોટેશનથી પરિશિષ્ટો કરાવવામાં આવે તે અચુક જોવાનું રહેશે. "

સંદર્ભ હેઠળના પત્રોની અન્ય તમામ શરતો યથાવત રહેશે તથા જે લેબોરેટરી જે પરીક્ષણો માટે માન્ય હોય તે
પરીક્ષણો જે તે લેબોરેટરીમાં થાય તેની કાળજી અચુક લેવાની રહેશે.

(પારસ સંઘવી)
ઉપ સચિવ
માર્ગ અને મકાન વિભાગ

પ્રતિ,

૧. સંયુક્ત નિયામકશ્રી (રસ્તા) ગુજરાત ઈજનેરી સંશોધન સંસ્થા જે.સી. રેસકોર્સ રોડ, વડોદરા.
૨. અધિક્ષક ઈજનેરશ્રી, (મા.મ.) વર્તુળ-૧, અમદાવાદ.
૩. અધિક્ષક ઈજનેરશ્રી, આલેખન (મા.મ.) વર્તુળ, ગાંધીનગર.
૪. સર્વે અધિક્ષક ઈજનેરશ્રીઓ
(મા.મ. વર્તુળ/ પંચાયત મા.મ. વર્તુળ/ ને.હા. વર્તુળ/ એકસપ્રસ વે વર્તુળ/ રાજ્ય માર્ગ યોજના વર્તુળ/
ઈલેક્ટ્રીક મા.મ. વર્તુળ/ પા.યો. વર્તુળ સહિત)
૫. સર્વે કા.ઈ.શ્રીઓ, ઉપરોક્ત વર્તુળો હસ્તકના સર્વે વિભાગો / સર્વે શાખાઓ મા.મ. વિ.
૬. ગુણવત્તા નિયમન, મા.મ. વિભાગ, સચિવાય, લગાંધીનગર.
૭. ૨- નકલ સેલેક્ટ ફાઈલ- ૨૦૧૦

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
અધિક્ષક ઈજનેરની સહી :

ખાનગી / તાત્કાલીક / તકેદારી આયોગ સંદર્ભ
ક્રમાંક : ગુનિ/જન/૪૮૪/૧૦

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
૧૪/૧, સરદાર ભવન
સચિવાલય, ગાંધીનગર
તા. ૨૮-૧૦-૨૦૧૦

પ્રતિ

- (૧) મુ.ઈ. (મા.મ.) અને અ.સ.શ્રી, મા અને મ વિભાગ, સચિવાલય, ગાંધીનગર
- (૨) મુ.ઈ. (પં) અને અ.સ.શ્રી, મા અને મ વિભાગ, સચિવાલય, ગાંધીનગર
- (૩) મુ.ઈ. (પા.યો.) અને અ.સ.શ્રી, મા અને મ વિભાગ, સચિવાલય, ગાંધીનગર
- (૪) મુ.ઈ. (રા.પો) અને અ.સ.શ્રી, મા અને મ વિભાગ, સચિવાલય, ગાંધીનગર
- (૫) મુ.ઈ. (પી.પી.યુ) મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર
- (૬) મુ.ઈ. (ગુજરાત સ્ટેટ રોડ ડેવલપમેન્ટ કોર્પોરેશન)
મા×મ. વિભાગ નિમાર્ણ ભવન, ગાંધીનગર

વિષય :- બાંધકામની વિગતો તથા સ્પેશીકીકેશન દર્શાવતા બોર્ડ કામના સ્થળે મુકવા અંગે ઉપરોક્ત વિષય પરત્વે સવિનય જણાવવાનું કે

- (૧) જાહેર બાંધકામો (ખાસ કરીને રૂા પાંચ લાખથી વધુ કિંમત) ના કામની વિગતો તથા સ્પેશીકીકેશન દર્શાવતા બોર્ડ મુકવા જરૂરી છે.
- (૨) આવા બોર્ડ ઈજારદારશ્રીના ખર્ચે લગાવવાની જોગવાઈ રાખવામાં આવે
- (૩) આ બોર્ડમાં સંબંધીત કાર્યપાલક ઈજનેરશ્રીનું સરનામુ, ફોન નંબર, ફેક્સ નંબર પણ જણાવવો જરૂરી છે.

ઈજારદારશ્રી નિયત સ્થળે બોર્ડ લગાવીને ફોટોગ્રાફસ સહીતનો અહેવાલ નાયબ કાર્યપાલક ઈજનેરશ્રીને કાર્યપાલક ઈજનેરશ્રીની જાણ હેઠળ ન કરે ત્યા સુધી હંગામી ધોરણે અમુક રકમ (૦.૨૫% થી ૧% જેટલી) રોકી રાખવાની કરારમાં જોગવાઈ કરવી.

મકાન જેવા સીમીત ક્ષેત્રફળ માટે એક બોર્ડ જરૂરી રસ્તા, પુલો, પાણીની પાઈપલાઈન, ગટર લાઈન જેવા કામોમાં કામના પ્રમાણે તેમજ બન્ને છેડા પર તેમજ વચ્ચે બોર્ડ મુકવા જોઈએ જાહેર બાંધકામ હાથ ધરતી તમામ સંસ્થાઓ ઉપરોક્ત ભલામણોનો અમલ કરે.

આપના તાબા હેઠળની તમામ કચેરીઓને આ અંગેની જાણ કરી ઘટતી કાર્યજવાહી સત્વરે કરવા જણાવવુ આપના તાબાની કચેરીઓ દ્વારા હાથ ધરવામાં આવેલ કાર્યવાહી તા. ૧૦-૧૧-૨૦૧૧ સુધીમાં અત્રે રજુ થાય તે ખાસ જોવુ.

(પી પુરબીયા)

મુખ્ય ઈજનેર (ગુણવત્તા અને સયુક્ત સચિવ)
માર્ગ અને મકાન વિભાગ

નકલ રવાના પ્રતિ

મુ.ઈ.શ્રી (ગુ.ના) ગાંધીનગર

કા.ઈ.શ્રી, ગુ.નિ.વિ. મ.મ.વિ.

ગાંધીનગર / અમદાવાદ / વડોદરા / સુરત / ભાવનગર / રાજકોટ તરફ જાણ સારુ

આપના દ્વારા પરીક્ષણ કરવામાં આવતા કામના સ્થળે બોર્ડ મુકવા સંબંધીત ઉપરોક્ત ભલામણોનો અમલ થાય છે કે નહીં જોવુ અને પરીક્ષણમાં આપવુ, આ ભલામણનો અમલ થાય તેનો આગ્રહ રાખવો.

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

રસ્તા, પુલો તથા મકાનોના બાંધકામની
વિગતો તથા સ્પેશીફિકેશન અંગેના બોર્ડ
કામના સ્થળ ઉપર મુકવા બાબત
જાહેર હિસાબ સમીતીની ભલામણ

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
પરિપત્ર ક્રમાંક - ટીએનસી - ૧૦૯૦ - ૨૪-સ-પાર્ટ-ફાઈલ
સચિવાલય, ગાંધીનગર
તા. ૦૫-૦૩-૨૦૧૧

સંદર્ભ :

- (૧) જા.બાં.વિ નો પરિપત્ર ક્રમાંક : બીડીજી-૩૨૭૭-(૧૬૫)-ન, તા. ૨૬-૪-૭૮
- (૨) મા.મ.વિ નો ઠરાવ ક્રમાંક : ટીએનસી-૧૦૯૦-૨૪-સ તા. ૨૭-૧૧-૯૦
- (૩) મા.મ.વિ નો ઠરાવ ક્રમાંક : ટીએનસી-૧૦૯૦-૨૪-સ તા. ૧૮-૧૧-૯૧
- (૪) મા.મ.વિ નો ઠરાવ ક્રમાંક : ટીએનસી-૧૦૯૦-૨૪-સ તા. ૨૨-૦૭-૯૮
- (૫) મુખ્ય ઈજનેરશ્રી(ગુ.ની) અને અધિક સચિવશ્રી, માર્ગ અને મકાન વિભાગ,
સચિવાલય, ગાંધીનગરના પત્ર ક્ર. ગુની / જન/ ૪૮૪/૧૦, તા. ૨૮-૧૦-૨૦૧૦
- (૬) જાહેર હિસાબ સમીતીની તા. ૪-૧-૨૦૧૧ ની બેઠક

પરિપત્ર

માર્ગ અને મકાન વિભાગના સંદર્ભ હેઠળના ઠરાવો / પરિપત્રથી રસ્તા, પુલો અને મકાનોના કામોના વર્ક
ઓર્ડર આપ્યા બાદ તુર્ત જ કામના સ્થળે કામની વિગતો તથા સ્પેશીફિકેશન દર્શાવતુ બોર્ડ ઈજારદારશ્રી
સ્વખર્ચે મુકવાની સુચના આપવામાં આવેલ છે. તા. ૧૮-૧૧-૯૧ ના ઠરાવ અનુસાર આ બોર્ડ મુકવાની શરત
ટેન્ડરના ભાગ તરીકે ગણવા પણ ઠરાવ કરવામાં આવેલ છે.

- (૨) તા. ૪-૧-૨૦૧૧ ના રોજ યોજાયેલ જાહેર હિસાબ સમીતીની બેઠકમાં સુચવ્યા પ્રમાણે તેમજ
સંદર્ભીત પત્ર - ૫ ના પત્રથી ગુજરાત તકેદારી આયોગ દ્વારા કરવામાં આવેલ નીચે મુજબની
ભલામણોનો પણ ચુસ્તપણે અમલ કરવા આથી જણાવવામાં આવે છે.
- (૧) જાહેર બાંધકામો (ખાસ કરીને રૂા. પાંચ લાખ થી વધુ કિંમત) ના કામની વિગતો તથા સ્પેશીફિકેશન
દર્શાવતા બોર્ડ મુકવા જરૂરી છે.
- (૨) આવા બોર્ડ ઈજારદારશ્રીના ખર્ચે લગાવવાની જોગવાઈ ટેન્ડરમાં રાખવામાં આવે
- (૩) આ બોર્ડમાં કામને સંબંધીત કાર્યપાલક ઈજનેરશ્રીનું સરનામું, ફોન નંબર, ફેક્સ નંબર, અને કામ શરૂ
થવાની તારીખ, કામ પૂર્ણ થવાની તારીખ, ઈજારદારશ્રીનું નામ, તફલીફ હોય તો કોને મળવું તેની
વિગતો સહીત તમામ વિગતોનો સમાવેશ કરવો.
- (૪) ઈજારદારશ્રીને નિયત સ્થળે બોર્ડ લગાવીને ફોટોગ્રાફસ સહીતનો અહેવાલ નાયબ કાર્યપાલક
ઈજનેરશ્રીને કાર્યપાલક ઈજનેરશ્રીની જાણ હેઠળ ન કરે ત્યા સુધી હંગામી ધોરણે અમુક રકમ (૦.૨૫
થી ૧% જેટલી) રોકી રાખવાની કરારમાં જોગવાઈ કરવી.

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

- (પ) મકાન જેવા સીમીત ક્ષેત્રકળ માટે એક બોર્ડ મુકવુ જરૂરી છે. જ્યારે રસ્તા , પુલો, પાણીની પાઈપ લાઈન, ગટર લાઈન, કેનાલ વિગેરે કામોમાં લંબાઈનો વ્યાપ વધુ હોય ત્યારે આવા કામોમાં એક કરતા વધુ બોર્ડ (જનતાની અવરજવર વધુ હોય ત્યા તેમજ બન્ને છેડા પર અને વચ્ચે) ટ્રાફીક સલામતીને ધ્યાને રાખી બોર્ડ મુકવાની જોગવાઈ કરારમાં કરવી.
- (દ) જાહેર બાંધકામ હાથ ધરતી તમામ સંસ્થાઓ ઉપરોક્ત ભલામણોનો અમલ કરે.
- (૩) કામોના સ્થળ ઉપર સંદર્ભીત સુચનાઓનો ચુસ્તપણે અમલ થાય તેની દરેક અધિકારક ઈજનેરશ્રી / કાર્યપાલક ઈજનેરશ્રી / નાયબ કાર્યપાલક ઈજનેરશ્રીએ કાળજી રાખવાની રહેશે.

(આર કે. ચૌહાણ)
ખાસ ફરજ પરના અધિકારી (વિ.યો)
માર્ગ અને મકાન વિભાગ

પ્રતિ

સર્વે મુખ્ય ઈજનેરશ્રીઓ, માર્ગ અને મકાન વિભાગ
સર્વે અધિકારક ઈજનેરશ્રીઓ, મા.મ. વર્તુળ / પંચાયત મા.મ. વર્તુળ / નેશનલ હાઈવે વર્તુળ / એક્સ્પ્રેસ વે વર્તુળ /
પાટનગર યોજના વર્તુળ અને વિધુત (મા.મ.) વર્તુળ
સર્વે કાર્યપાલક ઈજનેરશ્રીઓ ઉપરોક્ત વર્તુળો હસ્તકના સર્વે વિભાગો
સર્વે તાંત્રીક અધિકારીશ્રીઓ (ના.કા.ઈ.શ્રીઓ સહીત) મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર
સર્વે શાખાઓ, મા.મ વિભાગ, સચિવાલય, ગાંધીનગર
માર્ગ અને મકાન વિભાગ હેઠળના સર્વે બોર્ડ / નિગમ
સીલેક્ટ ફાઈલે - ૨૦૧૧

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

મકાનો તથા પુલોના આર.સી.સી. કામોમાં
લોખંડના સળીયાના માપો લખવા તથા
ચુકવણીમાં લેપ લેન્થ ની લંબાઈ
ગણતરીમાં નહીં લવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
સચિવાલય, ગાંધીનગર
પરિપત્ર ક્રમાંક- PDW-10-2017-01-C
તા.૧૫-૦૨-૨૦૧૭

પરિપત્ર:-

મકાન, રસ્તા અને પુલોના કામોમાં આર.સી.સી. આઉટરોમાં સમાવિષ્ટ સ્ટીલ રેઇનફોર્સમેન્ટના માપો લખવા અને ચુકવણી દરમિયાન લેપની લંબાઈ ગણતરીમાં લેવામાં આવે છે. રેઇનફોર્સમેન્ટમાં લેપની વધુ સંખ્યાને પ્રોત્સાહન ન આપતા સહાય રેઇનફોર્સમેન્ટ (સળીયા) જ મહદઅંશે વપરાય એ તાંત્રિક રીતે વધુ ચોક્કસ છે.

MORT&H સ્પેસીફિકેશનના પૂર્વત્તમન ધારાધોરણ મુજબ રેઇનફોર્સ (સળીયા)ના ચુકવણીમાં લેપની લંબાઈના માપો ગણતરીમાં લેવામાં આવતા નથી. (Section 1608)

MORT&H સ્પેસીફિકેશનના પૂર્વત્તમન ધારાધોરણ મુજબ માર્ગ અને મકાન વિભાગ હેઠળ મકાન, રસ્તા અને પુલના રેઇનફોર્સ (સળીયા)ના સ્પેસીફિકેશનમાં Mode of Measurement & Payment માં હવે પછી નીચે મુજબના ફેરફાર કરવા આથી મુચના આપવામાં આવે છે.

| EXISTING ITEM | PROPOSED AMENDMENT (As per MORT&H Specification Item No.1608) |
|---|--|
| મકાનના સ્પેસીફિકેશન | મકાનના સ્પેસીફિકેશન |
| 5.4.10 Providing an Mild Steel reinforcement for R.C.C. work including bending binding and placing in position etc. complete up to floor two level. | 5.4.10 Providing an Mild Steel reinforcement for R.C.C. work including bending binding and placing in position etc. complete up to floor two level. |
| 5.4.11 High yield deform bars steel reinforcement for R.C.C. work including bending, binding and placing in position complete up to floor two level. | 5.4.11 High yield deform bars steel reinforcement for R.C.C. work including bending, binding and placing in position complete up to floor two level. |
| 3.2 Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to in place lap joints, such | 3.2 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 |

Signature of the Contractor :
કેન્ડુસેટની સહી :

Signature of the Executive Engineer
અવધાનક ઉજવેરની સહી :

②

| <p>joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tones on the same basis of as per M-18 even though steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.</p> | <p>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.</p> |
|--|---|
| <p>EXISTING ITEM</p> | <p>PROPOSED AMENDMENT (As per MORT&H Specification Item No.1608)</p> |
| <p>રસ્તાની સ્પેશીયલિઝેશન</p> <p>Item No. 39 : Providing steel reinforcement.</p> <p>a) Providing and placing in position mild steel bar reinforcement including cutting, bending, hooking and tying complete as per details.</p> <p>b) High yield strength deformed bars reinforcement.</p> <p>(10) Reinforcement shall be measured in length separately for different diameters as actually used in the work, from the length so measured the weight of reinforcement shall be calculated in tones on the same basis of IS : 1732 even though steel is supplied to the contractor by the Department on actual wieghment. Length shall ilcude hooks at ends. Wastage and annealed steel wire for binding shall not be measured and cost of thes items shall be deemed to be</p> | <p>રસ્તાની સ્પેશીયલિઝેશન</p> <p>Item No. 39 : Providing steel reinforcement.</p> <p>a) Providing and placing in position mild steel bar reinforcement including cutting, bending, hooking and tying complete as per details.</p> <p>b) High yield strength deformed bars reinforcement.</p> <p>(10) Reinforcement shall be measured in length including hooks, if any, separately for differencet 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</p> |

Signature of the Contractor :
મોહનભાઈ મહી :

Signature of the Executive Engineer
મધુભાઈ ઇન્ડરની મહી :

3

| | |
|---|---|
| included in the rates for reinforcement. | 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. |
| <p>પુલના સ્પેશીયલિઝેશન</p> <p>Item: 21 -Providing</p> <p>(A) Mild Steel Reinforcement</p> <p>(B) High Yield Strength Deformed bars, reinforcements.</p> <p>(10) Reinforcement shall be measured in length including overlaps, separately for different diameter, as actually used in the work, where welding or coupling is restored to, in place of lap-joints, such joints shall be measured for payment as the equivalent length of over lap as per design requirement. From the length so measured the weight of reinforcement shall be calculated in tones on the same basis of IS 1732 even though steel is supplied to the contractor by the Department on actual weightment. Length shall include hooks at ends. Wastage and annealed steel wire for binding shall not be measured and cost of these items shall be deemed to be included in the rates for reinforcement.</p> | <p>પુલના સ્પેશીયલિઝેશન</p> <p>Item: 21 -Providing</p> <p>(A) Mild Steel Reinforcement</p> <p>(B) High Yield Strength Deformed bars, reinforcements.</p> <p>(10) 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.</p> |

(ચોન. જી. પરમાર)
ખાસ ફરજ પરના અધિકારી(વિ.ચો.)
મોર્ગ અને મકાન વિભાગ

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
અધિકારીની સહી :

સજવલરમાં જુદા જુદા સ્થળે પુલો, આર.ઓ.બી. તથા ફ્લાયઓવરના કામોના બાંધકામમાં Formwork, False Work and Temporary Structureની ડીઝાઇન તથા કામગીરી બાબત

ગુજરાત સરકાર

માર્ગ અને મકાન વિભાગ

બ્લોક નં.૧૪/૨, સરકાર ભવન,

સચિવાલય, ગાંધીનગર

ક્રમાંક: એસએસઆર/૧૦/૨૦૧૭/૦૧/સી

તા. ૨૦/૦૪/૨૦૧૭

પરિપત્ર

(સંખ્યા ૧૭)

માર્ગ અને મકાન વિભાગ દેશ સજવલરમાં જુદા જુદા સ્થળે પુલો, આર.ઓ.બી. તથા ફ્લાયઓવરના કામોના બાંધકામમાં Formwork, False Work and Temporary Structureની કામગીરી ડીઝાઇન IRC : 87 મુજબ કરવાની રહેશે. જેમાં-એલ.બી.સી. તથા બાંધકામ દરમિયાન આવતા મહત્તમ Dead Load, Live Loadને ધ્યાને લઈ ડીઝાઇન બાબતી કરવાની રહેશે. ડીઝાઇન તથા કીટેઇલીંગમાં Safety Standard તથા Construction Practices ના મુકાબે માર્ગ અને મકાન વિભાગના Specification for bridge work મુજબ ધ્યાને લેવાના રહેશે. તદ્દપરાંત સંબંધિત કાર્યપાલક ઇજનેર દ્વારા Formwork, False work and Temporary Structureની ડીઝાઇન તથા તે મુજબ થયેલ કામગીરીને પ્રમાણિત કર્યા બાદ જ કોંક્રીટીંગની કામગીરી કરવાની રહેશે.

ઉપરોક્ત સુચનાનો યુક્તપક્ષે અમલ તાત્કાલિક અસરથી કરવાનો રહેશે.

| | |
|----------------|---------|
| ગૃહ વિભાગ | |
| (7.5) Circle-2 | |
| સંખ્યા | 18 |
| તારીખ | 20/4/17 |
| ફ.ક. | સજવલર |
| S.E. | સજવલર |
| Issued No. | 550 |
| Date | 20/4/17 |

7-15 016

(સેન. પ્રમોટર)

ખાસ કરજ પરના અધિકારી (વિ.વો.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
અધિકારક ઇજનેરની સહી :