

GENERAL SPECIFICATIONS (Civil)

I SPECIFICATIONS FOR WORKS:

GENERAL NOTES:

- i) The detailed specifications given hereinafter are for the items of works attached herein, and shall be guidance for proper execution of work to the required standards.
- ii) It may also be noted that the specifications are of generalised nature and these shall be read in conjunction with the drawings. The work also includes all minor details of construction which are obviously and fairly intended and which may not have been referred to in these documents but are essential for the entire completion in accordance with standard Engineering practice.
- iii) Unless specifically otherwise mentioned, all the applicable codes and standards published by the Indian Standard Institution and all other standards which may be published by them before the date of receipt of tenders, shall govern in all respects of design, workmanship, quality and properties of materials and methods of testing, method of measurements etc. Wherever any reference to any Indian Standard Specifications occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued there to or revisions thereof, if any, up to the date of receipt of tenders.
- iv) In case there is no I.S.I. specification for the particular work, such work shall be carried out in accordance with the instructions in all respects, and requirements of the Employer. Wherever any reference to any Indian Standard Specification occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued there to or revisions thereof, if any, up to the date of receipt of tenders.
- v) The work shall be carried out in a manner complying in all respects with the requirements of relevant bye laws, concerning International Federation like FIH, ITF, FIBA etc. under the jurisdiction of which the work is to be executed or as directed by the Employer and, unless otherwise mentioned, nothing extra shall be paid on this account.
- vi) Samples of various materials, fittings etc. proposed to be incorporated in the work shall be submitted by the contractor for approval of the Employer before order for bulk supply is placed.
- vii) The contractor shall take instructions from the Employer regarding collection and stacking of materials in any place. No materials shall be stacked on areas where other buildings, roads, services, compound walls etc. are to be constructed.
- viii) The contractor shall maintain in perfect condition all works executed till the completion of the entire work awarded to him. Where phased delivery is contemplated, this provision shall apply to each phase.
- ix) The contractor shall give a performance test of the entire installation(s) as per standard specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.
- x) The contractor shall clear the site thoroughly of all scaffolding materials and rubbish etc. left out of his work and dress the site around the building to the satisfaction of the Employer before the works considered as complete.
- xi) **Inspection and testing:** After completion of the work and during maintenance period liability

of the contractor, the work shall also be subjected to 'Post construction inspection and testing'. In case the materials or articles incorporated in the work are found to be inferior, though the sample collected for the same might have been passed at the time of execution, it shall be the responsibility of the contractor to replace the same at his own cost, failing which the Department may rectify the same at the risk and cost of the contractor or Department may accept the work as sub-standard, and cost be adjusted from the outstanding security deposit, as per the terms and conditions of the contract for the work.

- xii)** The PMC shall be the sole deciding Authority as to the meaning; interpretations and implications for various provisions of the specifications and his decision in writing shall be final and binding on all concerned.
- xiii)** In case any difference or discrepancy between the specifications and the drawings the specification shall take precedence.
- xiv. All Latest Versions of I.S. codes shall be referred
- xv.** Bidder must select items as per satisfaction of employer from the list of approved makes as specified. It is further clarified that bidder must install items only as specified in the list of approved makes , In case any other make is specified elsewhere in the tender document then also makes specified in the list of approved makes will be considered as final. All samples / Mockups shall be approved by the Employer / Employer representative prior to installation.
The contractor may bring the product of superior specifications/quality as compare to the brand specified, subject to approval of Authority.

SECTION- C

DEMOLITION, DISMANTLING AND MODIFICATION DURING CONSTRUCTION OF BUILDING INTERIORS.

GENERAL:

SCOPE OF WORK

Work Included:

This section covers the requirement of works involving demolition and/ or dismantling parts of building not involving the structure or any part of the building that contributes to the integrity and stability of the building.

This section includes preliminary work in preparation for demolition such as obtaining permits, disconnection and/ or controlled operation of building services, precautionary measures for the safety of the building, its occupants and works.

This section includes demolition of non-load bearing masonry and concrete walls all type of partitions and wall cladding doors and windows suspended ceilings wall and floor finishes.

This section includes the dismantling of built-in cabinets, counters furniture and fixtures.

This section includes disconnection, dismantling and controlled operation of electrical systems, water supply drainage and sanitary systems HVAC systems and all other building services by skilled operatives competent in their respective fields.

This section includes the salvaging, retrieval and safe storage of all material as required by the Contract and transport and disposal of all unwanted material and debris.

Work Excluded: -

This section does not include structural demolition or modifications.

RELATED WORK SPECIFIED ELSEWHERE

Temporary works

Electrical

Water supply and drainage

HVAC

APPLICABLE CODES AND STANDARDS

The latest version of the following codes and standards are available to the works covered by these specifications. The contractor shall obtain copies of these codes and standards and have them on site for ready reference.

National Building code of India (NBC) Part VII, Constructional Practice and safety.

IS: 13430 Code of Practice for safety during additional construction and alteration to existing building.

IS: 13415 Code of safety for protective barriers in and around buildings.

IS: 13416 Recommendations for preventive measures against hazards at work places.

Part I – Falling material hazards prevention.

IS: 13416 Recommendations for preventive measures against hazards at work places

Part II- Fall preventions

IS: 7969 Safety codes for handling and storage of building material

IS: 369 Safety codes for scaffold and ladders Part I Scaffolds.

IS: 3696 Safety codes for scaffolds and ladders Part II Ladders

IS: 4912 Safety requirements for floor and wall openings, railing and toe board

National Building code of India (NBC) Part VII, For RCC AND CONCRETE

IS: 456:2000 Plain and Reinforced Concrete - Code of Practice

IS: 15658-2006 PRECAST CONCRETE BLOCKS FOR PAVING — SPECIFICATION

IS: IS 6461 - 1972 (Part-III) Glossary of terms relating to cement concrete, Part III: concrete reinforcement

IS 2502 – 1963 Code of Practice for Bending and Fixing of Bars for Concrete Reinforcement

IS 432-1982 (Part - II)- Mild Steel and Medium Tensile Steel Bars and Hard-Drawn Steel Wire for Concrete Reinforcement, Part 2: Hard-Drawn Steel Wire.

IRC :15-2011 STANDARD SPECIFICATIONS AND CODE OF PRACTICE FOR CONSTRUCTION OF CONCRETE ROADS

Detail Specifications For Earth Soil:

1. The selected earth shall be that obtained from excavated material or shall have to brought from outside as indicated in the item. If item does not indicate anything, the selected earth shall have to be brought from outside.
2. The selected earth shall be good yellow soil and shall be got approved from the Engineer-in-charge. In no case black cotton soil or similar expansive and shrinkable soil shall be used. It shall be clean and free from all rubbish and perishable materials, stones or brick bats. The clods shall be broken to a size of 50. mm or less, Contractor shall make his own arrangement at his own cost for land for borrowing selected earth. The stacking of material shall be done as directed by the Engineer-in-charge in such a way as not to interfere with any constructional activities and in proper stacks.
3. When excavated material is to be used, only selected stuff got approved from the Engineer-in-charge shall be used. It shall be stacked separately and shall comply with all the requirements of selected earth mentioned above

Mild Steel Bars

18.1 Mild steel bars reinforcement for R.C.C. work shall conform to I.S, 432 (Part-II) 1966 and shall be of tested quality. It shall also comply with relevant part of I.S. 456- 1978.

18.2 All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.

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

at the rate specified below :

1. 6 mm. 0.22 Kg./Rmt. 8 20 mm. 2.47 Kg./Rmt.
2. 8 mm. 0.39 Kg./Rmt. 9. 22. mm. 2.98 Kg./Rmt.
3. 10mm. 0.62 Kg./Rmt. 10. 25 mm. 3.85 Kg./Rmt.
4. 12 mm. 0.89 Kg./Rmt. 11. 28 mm. 4.83 Kg./Rmt.
5. 14 mm. 1.21 Kg./Rmt. 12. 32 mm. 6.3.1 Kg./Rmt.
6. 16mm. 1 .58 Kg./Rmt, 13. 36 mm. 7.99 Kg./Rmt.
7. 18 mm. 2.00 Kg./Rmt. 14. 40 mm. 9.86 Kg/Rmt.

1. High Yield Strength Steel Deformed Bars

- 19.1. High yield strength steel deformed bars be either cold twisted or hot/rolled, shall conform to I.S. 1739-1966 and I.S.1139-1966 respectively.
- 19.2. Other provision and requirements shall conform to specification No. M-18. for Mild steel bars.

2. Expansion joints- Premoulded filter:

- 27.1 .The item provides for expansion joints in R.C.C. frame structures for internal joints, as well as exposed pints, with the use of premoulded bituminous joint filler.
- 27.2. Premoulded bituminous joint filler, i.e. performed strip of expansion joint filler shall not get deformed or broken by twisting, bending or other handling when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.
- 27.3 Thickness of the pro-moulded joint filler shall be 25 mm. unless otherwise specified.
- 27.4 Premoulded bituminous joint filler shall conform to I.S. 1838-1961

DETAILED SPECIFICATIONS-EXCAVATION

4.0.0 (a) Excavation for foundation upto 1.5 M depth including sorting out and stacking useful materials disposing of the excavated stuff upto 50 metre lead-in loose or soft soil.

1.0. General: 1.1. Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand turfloam, clay, peat etc., fall under this category.

2.0 Clearing the site : 2.1 The site on which the structure is to be built shall be cleared and all obstructions, loose stone, materials and rubbish of all kind, bush, wood and trees shall be removed as directed: The materials so obtained shall be property of the Government and be conveyed and stacked as directed within 50 M. lead. The roots of the trees coming in the sides shall be cut and coated with a hot asphalt.

2.2 The rate of site clearance is deemed to be included in the rate of earth work for which no extra will be paid.

3.0 Setting out: After clearing the site, the center lines will be given by the Engineer-in-charge. The contractor shall assume

full responsibility for alignment, elevation and dimension of each and all parts of the tractor shall assume full responsibility for alignment elevation and dimension of each and all parts of the work. Contractor shall supply labourers, materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

4.0 Excavation : The excavation in foundation shall be carried out in true line and level and shall have the width and depth as

shown in the drawings or as directed. The contractor shall do the necessary shoring and shutting or providing necessary slopes to a safe angle, at his own cost. The payment for such precautionary measures shall be paid separately if not specified.

The bottom of the excavated area shall be levelled both longitudinally and transversely as directed by removing and watering

as required. No earth filling will be allowed for bringing it to level, if by mistake or any; other reason excavation is made

deeper or wider than shown on the plan or directed. The extra depth or width shall be made up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor. The excavation upto 1.5 m. depth shall be measured under this item.

5.0. Disposal of the excavated stuff : 5.1. The excavated stuff of the selected type shall be used in filling the trenches and

plinth or levelling the ground in layers including ramming and watering etc.

5.2. The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with

lead upto 50 M. and all lift.

6.0. Mode of measurement and payment:

- 6.1. The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge. No payment shall be made for surplus excavation made in excess of above requirements or due to slopping and sloping back as found necessary on account of conditions of soil and

requirements of safety.

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

4.0.0. (B) Excavation for foundation upto 1.5 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 metre lead in dense or hard soil.

1.0. Dense or Hard Soil: Any soil which generally require close application of picks or jumpers or scarifiers to loosen it stiff

clay, gravel and rubble stone etc. fall-under this category.

2.0. Workmanship : The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation work shall

be carried out in dense or hard soil.

3.0. Mode of measurement and payment:

3.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

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

4.0.0. (C): Excavation for foundation upto 1.5. M. depth including sorting out and stacking of useful materials and disposing

of the excavated stuff upto 50 meter in lead-hard murrum.

1.0. Hard murrum: The hard murrum shall be clean of good binding quality and of approved quality obtained from approved quarries, of disintegrated rocks which contain silicons material and natural mixture of clay of calcarions origin. The

size of hard murrum shall not be more than 20 mm.

2.0. Workmanship : The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation work shall

be carried in hard murrum.

3.0. Mode of measurement and payment:

3.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

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

4.0.0.(D) Excavation for foundation upto 1.50 M. depth including sorting out and stacking of useful materials and disposing

of the excavated stuff upto 50 meter lead-soft rock not requiring blasting.

1.0. Workmanship:

1.1. The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation shall be carried out for foundation upon 1.5 m. lift in soft-rock not requiring blasting.

1.2. The excavation in soft or disintegrated rock shall be carried out by crow bards, pickaxes or pneumatic drills or any other

suitable means. . .

1.3. If contractor desires to resort to blasting, he can do so with permission of the Engineer-in-charge but nothing extra shall

be paid to him.

1.3. If contractor desires to resort to blasting, he can do so with permission of the Engineer-in-charge but nothing extra shall

be paid to him.

1.4. The materials available from soft rock excavation shall be properly Stacked within 50m. lead and 1.5. m. lift and shall be the property of department.

1.5. The classification of strata of the foundation soil shall be done by the Engineer-in-charge and shall be acceptable to the

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contractor.

1.6. However this shall include the type of rock and boulder which may quarried or split with crow bars. Latcrite and conglomerate also come under this category.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No.4.0.0. (A) shall be followed.

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

4.0.0. (E): Excavation for foundation upto 1.5 M. depth including sorting out and stacking of useful materials and disposing

of the excavated stuff upto 50 meter lead in hard rocks.

1.0. Workmanship:

1.1. The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation for foundation work shall

be carried out in hard rock.

1.2. Excavation shall be done by blasting to the dimensions shown in the drawings or as directed. The blasting shall be carried

out only with written permission of the Engineer-in-charge. All the laws, regulations etc., pertaining to the precautions,

acquisition, transport, storage, landing and use of explosives shall be rigidly followed. The Magazine for the storage for the explosive shall be built to the design and specifications of explosive authority and located at the approved site. No unauthorized persons shall be admitted into the magazine and when not in use it shall be kept securely locked. No matches or inflammable materials shall be allowed in the Magazine. The Magazine shall have an effective lightning conductor. The rules of explosive 1940 revised from time to time shall be followed strictly for obtaining, handling, undertaking blasting work.

1.3. The contractor shall be responsible for damage to property, workmen, public due to any-accident due to use of explosives and blasting operations.

1.4. Precautions:

1.4.1. The blasting operation shall remain in charge of competent and experienced supervisor and workmen who are thoroughly acquainted with the details of handling explosives and blasting operations. The blasting shall be carried out during fixed hours of the day, preferably during the mid-day-lunch hours or at the close of the work as ordered in writing by the Engineer-in-charge. The hours of blasting shall be notified in advance to the people in the vicinity. All the charges shall be prepared by the man in charge only.

1.4.2. Red danger flags shall be displayed prominently in all directions during the blasting operations.

1.4.3. People except those who actually light the fuse shall be prohibited from entering into this area. The flag shall be stationed as 200 m. from the firing site in all directions and all persons including workmen shall be excluded from the flagged

area at least 10 minutes before the firing warning whistle being sounded for this purpose.

1.4.4. During excavation in rock by blasting, the lowest 15 cm. of the stratas shall be blasted with light charges so as not to shatter or weaken the underlying rock on which the foundation will be actually laid. If excavation in rock is done to larger width and lengths than those shown on the drawings or as directed, no payment shall be made for such over break. If excavation is done to depth greater than shown on the drawings or directed, excess depth shall be made up with foundation grade concrete as directed at the contractor's cost.

1.4.5. The charged hole shall be drilled to the required depth and in suitable places when blasting is done with powder, the fuse cut to the required length shall be inserted in the holes and the powder dropped in the powder shall be gently tamped with copper rod with rounded ends. The explosive powder shall then be covered with trapping materials which shall be tamped lightly but firmly. When blasting is done with dynamite and other high explosive, dynamite cartridges shall be prepared by inserting the square cut ends of fuse into the detonator, and finished with dippers at the open ends. The detonator

should be gently pushed into the primer leaving one third of the copper exposed outside. The primer shall be housed into the explosive. Bore holes shall be of such size that the cartridges can be easily passed down. The holes shall be cleared of all debris and explosive inserted. The space for about 20 cms. above the charge shall then be gently filled with dry clay pressed

home and rest of the tamping is firmed with any convenient materials gently packed with a wooden cover.

1.4.6. At a time, not more than 20 such charges shall be prepared and fired. The man in charge shall blow a whistle in a recognised manner for cautioning the people. All the people shall then be required to move to safe distances. The charges shall be lighted by the man in charge only. The man in-charge shall count the number of explosions, He shall satisfy himself

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that all the charges have been exploded before allowing the workmen to go to the work rite.

1.4.7. The contractor shall be fully responsible to strictly follow the prevailing rules and procedures regarding blasting Procedures.

1.5. Misfire:

1.5.1. In case of a misfire the following procedure shall be observed : 1.5.2. Sufficient time shall be allowed to account for the delayed blast. The man in charge shall inspect all the charges and determine the missed charge.

1.5.3. If it is the blasting powder charge, it shall be completely flooded with water. A new hole shall be drilled at about 45 C.m. from the old and fired. This should blast the old charge. Should it not blast the old charge, the procedure shall be repeated till the old charge is blasted.

1.5.4. In case of charge of gelatine, dynamite etc., the man in charge shall gently remove the lamping and the primer with detonator. A fresh detonator and primer shall then be used to blast the charge. Alternatively the hole may be cleared of one foot of lamping 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 fired when the misfired hole should explode at the same time. The man in charge shall report to the office at once all cases of misfire, the cause of the same and what steps were taken in connection therewith.

1.5.5. 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 as directed for inspection to ascertain whether all the remaining

materials in the box are also defective or not.

1.6. Accidents : 1.6.1. The contractor shall be solely responsible for any accident during the entire procedure of handling explosive and blasting and shall pay necessary compensation to persons affected or damage to lands or property etc., due to the blasting without extra claims on the department.

1.7. Account: 1.7.1. A Careful and day-to-day account of explosives shall be maintained by the contractor in an approved manner and shall be open to inspection of the Engineer-in-charge at all times. Surprise visit may also be paid by the Engineer-in-charge to the storage and in case of any unaccountable shortage or unsatisfactory accounting, the contractor shall be liable to be penalised by forfeiture of part or whole of his Security Deposit or by cancellation of tender in which case he shall not be entitled for any compensation.

1.8. Disposal of Excavated materials :

1.8.1. No materials excavated from foundation trenches of whatever kind they may be, are to be placed even temporarily nearer than 1.5m. of distance prescribed by the Engineer from the outer edge of excavation. All materials excavated shall remain the property of Government. Rate for excavation includes sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach upon the area required or constructional purpose. The site shall be left clean of all debris on completion.

1.8.2. Disposal of excavated materials is subject to the following :

Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead of 50 metres as directed.

Useful materials obtained from clearing site and excavation shall be stacked within a lead of 50 M. beyond the building area

as directed. Materials suitable for back filling shall be stacked at convenient places within a lead of 50 M. from the structure

for reuse. Useful stones from rock excavation shall be stacked neatly within a lead of 50 M. and will be allowed to be used by the contractor on payment at rates laid down in the contract or if not so laid down, at schedule of rates of the Division or at mutually agreed rates if there are no such rates in the Schedule of rates.

1.8.3. If surplus materials are required to be conveyed beyond 50 M. conveyance will be paid for under a separate item.

2.0. Mode of measurement and payment:

2.1. The work shall be measured for the work limited to the dimensions shown on drawings or directed. Excavation to dimensions in excess of the above will not be measured or paid for and if so ordered by the Engineer the contractor shall have

to fill up the excess depth with cement concrete specified for foundation without extra payment.

2.2. Driving of sounding bards, drill holes to explore the nature of substratum upto a total length of meter distributed in 2 or 3

places in each foundation if necessary, will be considered incidental work and will not be paid for separately.
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2.3. Removal of slips and blows in the foundation trenches will not be measured or paid for.

2.4. If it is necessary in the opinion of the Engineer-in-charge to carry foundation below the levels shown on the plans, the excavation for the first 1.5 M. of additional depth will be included in the quantity for the particular classification and will be

paid for as extra work at rate to be decided under the general conditions of contract unless the contractor is willing to accept payment as tendered rates.

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

4.001 (A): Excavation for foundation for depth from 1.50 M. to 3.0 M. including sorting out and stacking of useful materials

and disposing of the excavated stuff upto 50 M. in lead-loose or soft soil.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (A) shall be followed except that the excavation work shall be carried out in loose or soft soil with lift 1.5 M. to 3.0 M.

2.0 Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work of lift 1.5 M. to 3.0 M. shall be measured under this item.

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

4.001. (B) Excavation for foundation for depth from 1.5. M. to 3.0 M. including sorting out and stacking of useful materials

and disposing of excavated stuff upto 50 M. lead in Dense or Hard soil.

1.0. Workmanship: The relevant specification of item No. 4 0.0. (B) shall be followed except that the excavation work shall

be carried out with 1.5 M. to 3.0 M. lift in dense or hard soil.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 1.5 to 3.0 M. shall be measured under this item.

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

4.001.(C): Excavation for foundation for depth from 1.5 M. to 3.0 M. including sorting out and stacking of useful materials

and disposing of excavated stuff upto 50 M. lead in Hard murrum.

1.0. Workmanship: 1.1. The relevant specification of item No. 4.0.0. (C) shall be followed except that the excavation work

shall be carried out from 1.5 M. to 3.0 M. lift in hard murrum.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 1.5 M. to 3.0 M. Shall be measured under this item.

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

4.001. (D): Excavation for foundation for depth 1.5 M. to 3.0 M. including sorting out and stacking of useful material and disposing of excavated stuff upto 50 M. lead in soft rock not requiring blasting.

1.0. Workmanship : The relevant specification of item No. 4.0.0. (D) shall be followed except that the excavation work shall

be carried out from 1.5 m to 3.0 M. lift in soft rock not requiring blasting.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 1.5 M. to 3.0 M. lift shall be measured under this item.

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

4.001.(E): Excavation foundation for depth 1.5 M to 3.0 M. including sorting out and stacking of useful material and disposing of excavated stuff upto 50 M. lead in hard rock.

1.0. Workmanship: 1.1. The relevant specification of item No. 4.0.0. (E) shall be followed except that the excavation work

shall be carried out from 1.5 M. to 3.0 M. lift in hard rock.

2.0. Mode of measurement and payment:

2.1 The relevant specification of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 1.5 M. to 3.0 M. lift shall be measured under this item.

2.3. The rate shall be for a unit of one cubit metre.

4.002. (A): Excavation for foundation for depth 3.0 M. to 5.0 M. including sorting out and slacking of useful materials and disposing of the excavated stuff upto 50 M. lead in loose of soft soil.

1.0. Workmanship : 1.1. The relevant specifications of item No. 4.0.0. (A) shall be follwed except that the excavation work

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shall be carried out from 3.0 M. to 5.0 M. lift in loose of soft soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M, lift shall be measured under this item.

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

4.002. (B): Excavation for foundation for depth from 3.0 M. to 5.0 M-including sorting out and slacking of useful materials

and disposing of the excavated stuff upto 50 M. lead in Dense or Hard soil.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (B) shall be followed except that the excavation work

shall be carried out from 3.0 M. to 5.0 M. lift in Dense or Hard soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

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

4.002. (C): Excavation for foundation for depth from 3.0 M. to 5.0 M including sorting out and stacking of useful materials

and disposing of the excavated stuff upto 50 M. lead in Hard murrum.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (C) shall be followed except that the excavation work

shall be carried out from 3.0 m. to 5.0 M. in hard murrum.

2.0. Mode of measurement and payment:

.2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

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

4.002 (D): Excavation for foundation for depth from 3.0 M. to 5.0 M including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 M. lead in soft rock not requiring blasting.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (D) shall be followed except that the excavation work

shall be carried out from 3.0 M. to 5.0 M. in soft rock not requiring blasting.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

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

4.002.(E) :Excavation for foundation for depth from 3.0 M. to 5.0 M including sorting out and stacking of useful materials and disposing of excavated stuff upto 50 M. lead in Hard rock.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (E) shall be followed except that the excavation work

shall be carried but from 3.0 M. to 5.0 M. in hard rock.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

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

4.003.(A): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking of useful materials disposing of the excavated stuff upto 50 M. lead in loose or soft soil.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (A) shall be followed except that the excavation work

shall be carried out from more than 5.0 M. lift in loose or soft soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of No. 4.002. (E) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003. (B): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking of useful materials disposing of excavated stuff upto 5.0 M. lead in Dense or hard soil.

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1.0. Workmanship: 1.1. The relevant specifications of item No. 4.00. (B) shall be followed except that the excavation work

shall be carried out from more than 5.0 M. lift in dense or hard soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4002. (B) for carrying out excavation work for additional

depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003. (C): Extra for additional depth more than 5.0 M. for excavation for foundation including spiting out and stacking of useful materials disposing of excavated stuff upto 5.0 M. lead in Hard murrum.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (C) shall be followed except that the excavation work

shall be carried out from more than 5.0 M. lift in hard murrum.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.002. (C) for carrying out excavation work for additional

depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003.(D): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking of useful materials disposing of excavated stuff 5.0 M. lead in soft rock not requiring blasting.

1.0. Workmanship : 1.1. The relevant specifications of item No. 4.0.0. (D) shall be followed except that the excavation work

shall be carried out from more than 5.0 M. lift in soft rock not requiring blasting.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.002 (D) for carrying out excavation work for additional

depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003.(E): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking a useful materials disposing of excavated stuff upto 50 M. lead in hard rock.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (E) shall be followed except that the excavation work shall be carried out from more than 50 M. lift in hard rock.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.002 (E) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.12. Filling available from 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.

1.0. Workmanship:

1.1. The earth to be used for. filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken.

1.2. As soon as the work in foundation has been completed and measured, the site of foundation shall be cleared of all debris,

brick bats, mortar dropping etc; and filled with earth in layers not exceeding 20 Cms. Each layer shall be adequately watered,

rammed and consolidated before the succeeding layer is laid. The earth shall be rammed with iron rammers where feasible and with the butt ends of crow-bars, where rammer cannot be used.

1.3. The plinth shall be similarly filled with earth in layers not exceeding 20 Cms. adequately watered and consolidated brammung with iron or wooden rammers. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

1.4. The finished level of filling shall be kept to shape intended to be given to floor.

1.5. In case of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation required shall also be as specified.

1.6. The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no

28 circumstances black cotton soil be used for filling the plinth.

2.0. Mode of measurement and payment:

2.1. The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage or voids, if consolidated as instructed above.

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

4.24. Filling in plinth with sand under floors including watering, ramming consolidating and dressing etc. complete.

1.0. Materials: 1.1. Sand shall conform to M. 6.

2.0. Workmanship : 2.1. The relevant specifications of item No. 4.12 shall be followed except that sand shall be filled in undo, floors, including watering, ramming, consolidating and dressing etc. complete.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 4.12 shall be followed.

3.2. The rate includes cost of collecting carting sand with all lead and labour for filling the same in plinth under floors.

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

4.004. : Filling in foundation and plinth with murrum or selected soil in layers of 20 cm. thickness including watering, ramming and consolidating etc. complete.

1.0. Materials : 1.1. Murrum shall be clean of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rocks which contain silicons materials and natural mixture of clay of calcarions origin. The size

of murrum shall not be more than 20 mm.

2.0. Workmanship : 2.1. The relevant specifications of item No. 4.12 shall be followed except that the murrum or selected

soil shall be filled in foundation and plinth in 20 cms. layers including consolidating, ramming, watering, dressing etc. complete.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 4.12 shall be followed.

3.2. The rate includes cost of collecting and carting murrum/or selected earth of approved quality with all lead and labour required for filling in trenches and plinth.

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

4.005. Filling in foundation and plinth with brick-bats/chhara in layers of 20 cms. thickness including watering ramming and

consolidating etc. complete.

1.0. Materials : Bricks bats shall conform to M. 14.

2.0. Workmanship : The relevant specifications of item No. 4.12 shall be followed except that brick-bats of burnt bricks shall be filled in foundation and plinth in 20 cms. layers including watering, ramming, consolidating etc. complete.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 4.12 shall be followed.

3.2. The rate includes cost of collecting and carting brick/chhara with all lead and labour required for filling in trenches and plinth.

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

4.27. Boring holes 3.5 M. deep in ordinary soil (for cast in situ piles) and getting out the soil and disposal of the surplus excavated soil as directed within a lead of 50 M. for following diameter for piles (i) 200 mm. (ii) 250 mm. (iii) 300 mm.

1.0. Workmanship:

1.1. The ground shall be roughly levelled and after making the position of piles, the holes shall be bored with aspiral angle to the 3.5 M. depth and specified diameter using boring guide.

1.2. The bore holes shall be truly vertical and uniform bore throughout of specified diameter. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed within a lead of 50 M.

2.0. Mode of measurement and payments:

2.1. The rate for boring holes shall include :-

(a) Roughly levelling the ground in positions where piles are to be provided.

(b) Making the positions of piles by pegs and boring guide and also for shifting of boring guide.

(c) Bailing out water, if any met with during boring.

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(d) Disposal of surplus excavated soil within a lead of 50 M. and

(e) All tools, plants, equipments and tuour required for satisfactory completion of work.

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

4.28. Extra for under reaming inside the bore holes for under reamed piles of following nominal diameter, (i) 200 mm. (ii) 250mm. (iii) 300 mm.

1.0. Workmanship : The relevant specifications of item No. 4.27 shall be followed except that after boring to the required depth, the bore shall be enlarged at the bottom by an under reamer 2 to 2 1/2 times the diameter of the bore as directed. It shall be ensured that the bore for the pile shall be enlarged to the correct diameter.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.27 shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.27 under reaming the piles.

2.3. The rate shall be for a unit of one Number.

DETAILED SPECIFICATIONS - PLAIN & RCC WORKS

5.1.6. Providing and laying in foundation and plinth/under floods lime concrete with hard broken aggregate 40 mm. nominal

size and 40% mortar comprising of 1 Lime putty : 2 fine sand and curing complete excluding cost of form work.

1.0. Materials: 1.1. Water shall conform to M-1. Sand shall conform to M-6. Lime shall conform to M-2. Graded aggregated

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

2.0. Workmanship:

2.1. General 2.1.1. Before starting the concrete the bed of the foundations trenches shall be cleared of all loose materials and

watered and rammed as directed.

2.2. Proportion of Mix :

2.2.1. The proportion of lime, sand and aggregate shall be specified in the item of the work and shall be measured by volume.

2.2.2. The lime mortar shall consist of proportion of 1 Lime putty : 2 sand volume. The lime mortar shall be prepared by wet

process Power driven mill shall be used for preparation of lime mortar. The slaked lime shall be placed in the Mill in even layers and ground for 180 revolutions with sufficient water. The water shall be added as required during grinding (and care shall be taken not to add more water) so that it will bring the mixed materials to a consistency of stiff paste, throughly wetted

sand shall then be added evenly and the mixture ground for another 180 revolutions.

2.2.3. Lime mortar shall be kept damp, protected from sun and rain till used-up, covering it by tarpauline or open sheds.

2.2.4. All the lime mortar shall be used as soon as possible after grinding. It should be used on the day of which it is prepared

but in no case mortar made earlier than 36 hours shall be permitted for use.

2.3. Mixing : 2.3.1. The concrete shall be mixed in mechanical mixer. Mixing shall be continued until there is uniform distribution of the material and the mass is uniform in colour and consistency but in no case mixing shall be done for less than 2 to 3 minutes.

2.4. Laying & Compacting: 2.4.1. The concrete shall always be used while quite fresh. It shall be laid (not thrown) in layers

not exceeding 150 mm: in thickness and shall be well and quickly_ rrammed with wooden or iron rammers, till the required compaction is achieved. The concrete laid shall not be of too fluid consistency. After it has been mixed no more water shall

be added, but the surface during and after compaction shall be kept damp. In laying consecutive layers, the layer east shall be

well watered and made rough before the upper layer is laid. The concrete shall be kept continuously wet for period of 7 days

from the date of placing or until it is built over whichever is more.

2.5. Mode of measurement and payment:

2.5.1. The concrete work shall be measured in length, breadth and depth as specified on drawing or as directed, correct upto

nearest centimetre and cubical content shall be worked out nearest upto two places or decimals.

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

5.1.8. Providing and laying in foundation and plinth/under floors lime concrete with graded bricks aggregate 40 mm. nominal

size and 40% mortar comprising of 1 Lime Putty : 9 find sand and curing complete excluding cost of form work.

1.0. Materials : 1.1. Water shall conform to M-1. Lime mortar shall conform to M-10. Brick bats aggregates 40 mm. nominal

size shall con form to M-14.

2.0. Workmanship : 2.1. The relevant specifications of item No. 5.1.6.'Shall be followed except that brick aggregate shall be

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ued instead of graded stone aggregate.

3.0. Mode of measurement and payment:

3.1. The concrete work shall be measured in length, breadth and depth as specified in drawing or as directed, correct upto larest centimetre and cubical content shall be worked out upto two places of decimals. 3 2. The rate shall be for a unit of

one

cubic metre.

5 3.2. (A) Providing and laying cement concrete 1:3:6(1 cement: 3 coarse sand: 6 graded stone aggregate 40 mm. nominal size) and curing complete excluding the cost of form work in foundations and plinth.

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

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

2.0. Workmanship:

2.1. General: 2.1.1. Before starting concrete bed of foundation treaches shall be cleared of all loose materials, levelled, watered and rrammed as directed.

2.2. Proportion of Mix : 2.2.1. The Proportion of cement, sand and coarse aggregate shall be one part of cement, 3 parts of

sand, 6 parts of stone aggregates and shall so measured by volume.

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

lowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineerin-

charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform

and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However such

cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 to 2 minutes. The quantity of water shall be sufficient to produce a dense concrete of

required workability for the purpose.

2.4. Transporting & Placing the concrete :

2.4.1. The concrete shall be handled from the place of mixing to the final position in not more than 15 minutes by the method

s directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

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

2.5. Compacting: 2.5.1. The concrete shall be rrammed with heavy iron rammers and rapidly to get the required compaction

and allow all the interestices to be filled with mortar.

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

less than 7 days from the dale of placement.

2.7. Mode of measurement and Payment:

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

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

5.3.3.(A) Providing and laying cement concrete 1:4 : 8 (1 cement: 4 coarse sand: 8 graded stone aggregate 40 mm. nominal

size) and curing complete excluding cost of form work in foundations and plinth.

1.0. Materials: 1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate

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

2.0. Workmanship : 2.1. Relevant specifications of item No. 15.3.2. shall be followed except that cement concrete shall be

mixed in the proportion of 1 : 4 : 8 instead of 1 : 3 : 6 by volume.

2.0. Mode of measurement and payment:

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

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

5.3.14 (A) Providing and laying cement concrete 1:3:6(1 cement: 3 coarse sand: 6 crushed stone aggregate 20 mm. nominal

size) and curing complete including cost of form work in wall caps/coping.

1.0. Materials & Workmanship : 1.1. The relevant specification of item No. 5.3.2 (A) shall be followed except that the work shall be carried out for coping and wall caps, except the stone aggregate 20 mm. nominal size shall be used for the concrete work of wall caps/coping.

2.0. Mode of measurement and payment: 2.1. The relevant specifications of item No. 5.3.2. (A) shall be followed except 31

that the rate includes cost of necessary form work.

2.1. The rate shall be for a unit of one cubic metre per metre.

5.3.3. (B): Providing and laying brick bats cement 1:4 : 8 (1 cement: 4 coarse sand: 8 graded brick bats) and curing complete

excluding the cost of from work in foundation and plinth.

1.0. Materials: 1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Brick bat shall conform to M-14.

2.0. Workmanship: 2.1. The specification of this item shall be followed as per item No. 5.3.3. except that the proportion of

brick bat cement concrete shall be 1 : 4 : 8 i.e. 1 part of cement, 4 parts of coarse sand and 8 parts of graded brick bat by volume, using graded brick bat as coarse aggregate instead of stone aggregate.

3.0 Mode of measurement and payments:

3.1. The concrete work shall be measured in length, breadth and depth as specified on drawing limiting dimensions to those

specified on drawings or as directed.

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

5.3.4. (a) : Providing and laying cement concrete 1 : 5 : 10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm. nominal size) and curing complete, excluding the cost of form work, for foundation and plinth.

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

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

2.0. Workmanship: 2.1. The relevant specification of item No. 5.3.2. (A) shall be followed for the work except that the work

is to be carried out in cement concrete 1 : 5 : 10.

3.0. Mode of measurement and payment:

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

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

5.3.8. (A) : Providing and laying cement concrete 1: 5 : 10 (1 cement: 5 coarse sand, 10 graded brickbats 10 mm. nominal size) and curing complete excluding, cost of form work in foundation and plinth.

1.0. Materials: 1.1. Water shall conform -to M-1, sand shall conform to M-6. Cement shall conform to M-3. Brick bats shall

conform to M-14.

2.0. Workmanship : 2.1. The relevant specification of item No. 5.3.4 shall be followed except that brick bats aggregate shall

be used instead of stone aggregate.

3.0. Mode of measurement and payment:

3.1. The relevant specification of item No. 5.3.4. shall be followed.

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

5.3.2. (B): Providing artd laying brick bat cement concrete : 1 : 3 : 6 (1 cement: 3 coarse sand : 6 graded brick bats) and curing complete excluding cost of form work in foundation and plinth.

1.0. The specification of item No. 5.3.2. A shall be followed for mode of measurements and payment except that it excludes the cost of form work.

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

5.4.18. Providing throating or plaster drip and moulding to R.C.C. Chhajjas.

1.0. Materials: Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-1 1.

2.0. Workmanship : 2.1. The work shall be carried out as directed. The proportion of mix for finishing touching shall be in CM. 1:2 by volume. Curing shall be done for not less than 7 days. The work shall be carried out in best workman like manner.

The throating or plaster drip, and moulding shall be one centimetre in thickness.

5.7.5. Extra for providing and mixing water proofing or plaster drip and moulding shall be one centimetre in thickness.

2.0. Workmanship : 2.1. The proportions of materials for the cement concrete shall be mentioned with the specifications of that item. The quantity of water proofing materials to be added and the method of addition shall be as specified by manufacturers.

2.2. Mixing 2.2.1. The mixing of the water proofing materials in cement, water or concrete shall be done according to the specifications of the manufacturer.

3.0. Mode of measurement and payment:

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3.1. The payment is extra over and above the rate of concrete for mixing water proofing proper.

3.2. The rate shall be for a unit of one Hire of Kg. per quintal of cement in which water proofing material is added.

5.7. 1. Providing and laying damp proof course 25 mm. thick cement concrete 1:2:4(1 cement, 2 coarse sand, 4 stone aggregate 10 mm. nominal size) and curing complete.

1.0. The specifications of item No. 5.3.1.(A) of ordinary concrete with, or without reinforcement shall be followed except that

the size of the stone aggregate shall be 10 mm. nominal size and the concrete work shall be carried out in 25 mm. thick damp proof course.

2.0. Mode of measurement and payment:

2.1. The rate includes cost of all material and labour required to complete the item.

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

5.3.13. Providing and laying cement concrete 1:2:4(1 cement: 2 coarse sand, 4 graded stone aggregate 20 mm. nominal size)

and curing complete excluding cost of form work in (A) foundation and plat, (B) Independent piers, columns and pillars upto floor two level.

1.0. Materials : Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to

M-8. Graded stone aggregate 20 mm. nominal size shall conform to M-12.

2.0. General:

2.1. The concrete mix is not required to be designed by preliminary tests. The proportion of the concrete mix shall be 1 : 2 :

4 (1 cement: 2 coarse sand ; 4 graded stone aggregate 10 mm. nominal size) by volume. Concrete work shall have exposed concrete surface or as specified in the item.

2.2. The designation ordinary M-100, M-150, M-200, M-250 specified as per. I.S. Corresponding approximately to 1 : 3 : 6,

1 : 2 : 4, 1 : 1 1/2 : 3 and 1:1:2 nominal mix of ordinary concrete by volume respectively.

2.3. The ingredients required for ordinary concrete containing one bag of cement of 50 Kg. by weight (0.0342 Cu. M.) for different proportions of mix shall be as under:

Grade of concrete

Total quantity of dry aggregate by volume per 50 Kgs. of cement to be taken as the sum of individual volume of fine and coarse aggregates, maximum

Proportion of fine aggregate to coarse aggregate

Quantity of water per 50 Kgs. of cement maximum.

1 2 3 4

M-100 (1 : 3: 6) 300 Liters Generally 1 : 2 for fine aggregate 34 Liters

M-150 (1 : 2 : 4) 2.20 “ to coarse aggregate by volume 32 “

M-200 (1 : 1 1/2 : 3) 160 “ but subject to and upper limit 30 “

M-250 (1:1:2) 100 “ of 1 : 1 1/2 and lower limit 1 : 3 27 “

2.4. The water cement ratios shall not more than those specified in the above table. The cement content of the mix specified

in the Table shall be increased if the quantity of water in a mix has to be increased to overcome the difficulties of placement

and compaction so that the water-cement-ratio specified in the Table is not exceeded.

2.5. Workability of the concrete shall be controlled by maintaining a water-cement-ratio that is bound to give a concrete mix

which is just sufficiently wet to be placed and compacted without difficulty with the means available.

2.6. The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than

one fourth of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the comers of the form.

2.7. For reinforced concrete work, coarse aggregates having a nominal size of 20 mm. are generally considered satisfactory.

2.8. For heavily reinforced concrete members as in the case of ribs of main beams, the nominal maximum size of coarse aggregate should usually be restricted to 5 mm. less than the minimum, clear distance between the main bars, or 5 mm.

less

than the minimum cover to the reinforcement whichever is smaller.

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2.9. Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be important and

the nominal maximum size may sometimes be as great as OF greater than the minimum cover.

2.10. Admixture may be used in concrete only with approval of Engineer-in-charge based upon the evidence that with the passage of time, neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel

impaired by the use of such admixtures.

3.0. Workmanship:

3.1. Proportioning : Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 Kg. weight. The volume of one such bag being taken as 0.0342 Cu. metre. Boxes of suitable sizes shall be used for measuring

sand aggregate. The size of the boxes (internal) shall be 35 cms. x 25 cms. and 40 Cms. deep. While measuring the aggregate

and sand, the box shall be filled without shaking ramming or hammering. The proportioning of sand shall be on the basis of

its dry volume and in case of damp sand, allowances for bulkage shall be made.

3.2 Mixing:

3.2.1. For all work, concrete shall “be mixed in a mechanical mixer which alongwith other accessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand, cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry mixing, measured quantity of water required for each batch of concrete mix shall be added gradually and

mixing continued for another one and a half minute. 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 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.

3.2.2. When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on the smooth watertight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material gets 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 arid cement shall then be mixed thoroughly by turning over to get a mixture to uniform colour. Specified quantity

of 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 percent above that specified.

3.2.3. Mixers which have been out of use for more than 30 minutes shall be throughly cleaned before putting in a new batch.

Unless otherwise agreed to by the Engineer-in-charge the first batch of concrete from the mixture 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. .

3.3. Consistency: 3.3.1. The degree of consistency which shall depend upon the nature of the work and methods of vibration

of concrete, shall be determined by regular slump tests in accordance with I.S. 1199-1959. The slump of 10 mm. to 25 mm.

shall be adopted when vibrators are used and 80 mm. when vibrators are not used.

4.4. Inspection:

3.4.1. 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 the safety of men, machinery, materials and for results obtained.

Immediately

before concreting, all forms shall be thoroughly cleaned.

3.4.2. Centering design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for 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 shim be cast and tied

to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

3.5. Transporting and laying:

3.5.1. The method of transporting and placing concrete shall be as approved. Concrete shall be so transported and placed that

no contamination segregation or loss of its constituent material takes place.

All form work shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete.

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No concrete shall be placed in any part of the structure until the approval of the Engineer-in-charge has been obtained.

3.5.2. Concreting 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. Except where otherwise agreed to

by 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.

3.5.3. Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding

2 metres. When trucking or chutes are used they shall be kept close 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 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.

3.5.4. 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 cannot

be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream

up to form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition

of water to dry mixture. During compaction, it shall be observed that needle vibrators are not applied on reinforcement which

is likely to destroy the bond between concrete and reinforcement.

3.6. Curing: Immediately after compaction, concrete shall be protected from weather, including rain, running water, shocks,

vibration, traffic, rapid temperature changes, frost and drying out process. It shall be covered with wet sacking, hassain or other similar absorbant material approved, 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. Masonary work over foundation concrete may be started after 48 hours of its laying

but curing of concrete shall be continued for a minimum period of 14 days.

3.7. Sampling and Testing of concrete :

3.7.1. Samples from fresh concrete shall be taken as per I.S. 1199-1959 and cubes shall be made, cured and tested at 7 days

or 28 days as per requirements in accordance with I.S. 516-1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a resonable chance of being tested i.e. the sampling should be spread over the entire period

of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following :

Quantity of concrete in the work No. of samples Quantity of concrete in the works No. of samples

1-5Cmt. 1 16-30Cmt. 3

6-15Cmt. 2 31-50 4

51 and above 4 + one additional for each additional 50 M. or part thereof.

NOTE : At least one sample shall be taken from each shift. Ten test specimens shall be made from each sample, five for testing at 7 days and the remaining five at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

3.7.2. Tire average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 Kg/Cm at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportions given for a particular grade docs not yield the specified strength, such concrete shall be classified as belonging to the appropriate lower,

grade concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher

grade on the ground that the test strength are higher than the minimum specified.

3.8. Stripping:

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3.8.1. The Engineer-in charge shall be informed in advance by the contractor of his intention lo strike the form work.

While

fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure, the

weather and other condition that influence the setting of concrete and pf the materials used in the mix. In normal circumstances (generally where temperatures are above 20 ° C) and where ordinary concrete is used, forms may be struck after expiry of periods specified in item No. 9.1 (A) for respective item of form work.

3.8.2. All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit

and struts are removed, the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centring shall be gradually and uniformly lowered in such 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 re-use the form

work, it shall be cleaned and made good to the satisfaction of 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.

3.8.3. Immediately after the removal of forms, all exposed bolts etc., 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 fine 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 consistency as is possible

to use. Considerable pressure shall be applied in filling and pointing to ensure thorough Riling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours.

If rock pockets/honeycombs in the opinion of the Engineer in- charge are of such an extent or character 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.

4.0. Mode of measurement and payment:

4.1. The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawings or as directed shall not be measured. No deduction shall be made for

(a) Ends of dis-similar materials such as joits, beams, posts, girders, rafters, purline trusses, corbels and steps etc upto 500 Sq.

Cm. in section.

(b) Opening upto 0.1 Sq. M.

4.2. The rate includes cost of all materials, labour, tools and plant required for mixing, placing, position, vibrating and compacting, finishing, as directed, curing and all other incidental expenses for producing concrete lied strength The rate excludes the cost of form work.

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

5.4.1. Providing and laying cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size)

and curing complete excluding cost of form work and reinforcement for reinforced concrete, work in :

(A) Foundations footing, base of columns and mass (C) Slabs, landings, shelves, balconies, internals beams girders and centilever upto floor two level (D) Columns, pillars, posts, and struts upto floor two level, (F) Staircase upto floor two level,

(K) Vertical and horizontal fins upto floor two level.

1.0. Materials & Workmanship :

1.1. The relevant specification of item No 5.3.13. shall be followed except that the work shall be carried out for reinforced concrete work for work as specified in item 1.2. In addition, the following stipulations shall be followed for:

(a) The bars shall be kept in position by the following methods:

(i) In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2(1 cement: 2coarse

sand) about 4 cms. x 4 cms. section and of thickness equal to the specified cover shall be placed between the bars and shuttering as lo secure and maintain the requisite cover of concrete over the reinforcement.

In case of cantilevered or doubly reinforce beams of slabs, the main reinforcing bars shall be held in position by introducing

chain spacers or supports bars at 1.0 to 1.2 metres centres.

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(ii) In case of columns and walls, the vertical bars shall be kept in position by means of timber temphates with slots accurately out in them The temphates shall be removed after concreting has been done below it. The bars may also be suitably

tied by means of annealed steel wires to the shuttering to maintain their position during concreting.

1.2. All bars projecting from pillars, columns, beams, slabs, etc., to which other bars and concrete are to be attached or bounded to later on, shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with

succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.

2.0. Mode of measurement and payment:

2.1. Relevant specifications of item No. 5.3.13 shall be followed.

2.2. The volume occupied by reinforcement shall not be deducted from R.C.C. work.

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

5.4.4. Providing and laying cement concrete 1:2:4(1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size)

for reinforced concrete chhajjas not exceeding 10 cms. thickness upto floor level including finishing the exposed surface with

cement mortar 1 : 3 (1 cement: 3 fine sand) to give a smooth and even surface centering and form work and curing complete

excluding cost of reinforcement.

1.0. Materials & Workmanship :

1.1. The cement mortar shall conform to M-1 1.

1.2. The relevant specifications of item No. 5.3.13 and 5.4.1 shall be followed except that the work shall be carried out for reinforced concrete chhajjas not exceeding 10 cms. in thickness.

1.3. The specifications for form work and centering shall be as per item No. 9.1

1.4. The finishing work in cement mortar 1:3(1 cement: 3.fine sand) shall be carried out as per specifications of item No. 17.59(1). Before the plastering is done, the surface of the concrete shall be raked for proper bond.

2.0. Mode of measurement and payment:

2.1 The relevant specifications of item No. 5.3.13 and 5.4.1 shall be followed except that the work of chhajjas upto 10 cms.

shall be carried out including centering form work and finishing the surface with cement mortar 1 :3 (1 cement: 3 fine sand).

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

5.4.10. Providing Mild Steel reinforcement of R.C.C. work including bending binding and placing in position etc. complete

upto floor two level.

1.0. Materials : 1.1. Mild steel bars shall conform to M-18. Mild steel binding wires shall conform to M-21.

2.0. Workmanship :

2.1. The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed.

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

2.3. Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed 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 o handling shall be straightened before being used on me work. They shall not be heated to facilitate bending. Unless otherwise specified, a 'U' type hook at the end of each bar shall invariably be provided to main reinforcement. The readius of the bend shall not be less than twice the diameter of the round bar and the length of straight part

of the bar beyond the end of the curve shall be at least four times the diameter of the round bar. In case of bars which are not

round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area.

The hooks shall be suitably encased to prevent any splitting of the concrete.

2.4. All the reinforcement bars shall be accurately placed in exact position shown on the drawing sand shall be securely held

in position during placing of concrete by annealed binding wire not less than 1 mm. in size, and by using stay blocks or metal

chair spacers, metal hangers, supporting wires or other approved devices at sufficiently-Close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of concrete, except

where shown on drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not 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

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in a clean condition until completely embedded m concrete. Special care shall be exceeded to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawing. All the bars prodruding from concrete and to which other bars are to be spliced and which are likely to

be exposed for a period exceeding 10 days shall be protected by a thick coast of neat cement grout. .

2.5. Bars crossing each other where required shall be secured by binding wiles (annealed) of size not less than I mm. in such

manner that they do not slip over each other at the time of fixing and concreting.

2.6. 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. 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 wires not less than 1 mm. thick twisted tight The overlaps shall be staggered for different bears

and located at points along the span where neither shear nor bending movement is maximum.

2.7. Whenever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall

have a cross-section sufficient to transpit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than normal corss-section of the

bar. Threads shall be standard threads. Steel for coupling shall conform to I.S. 226.

2.8. 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 when steel will not be 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 percent of the rods are

welded. Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of 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 I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

3.0. Mode of measurement and payment:

3.1. For the purpose of calculating consumption, wastage shall not be permitted beyond 5 percent. Excess consumption over

5% will be charged at penal rate.

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 of lap joints, such 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

tonnes on the same basis of as per M-18 eventhough 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.

3.3. The rate for reinforcement includes cost of steel binding wires its carting from Department a store to work site., cutting,

bending, placing; binding and fixing in position as shown on the drawings and as directed. It shall also include all devices for

keeping reinforcement in approved position, cost of joining as per approved method and all wastage and spacer bars.

3.4. The rate shall be for a unit of one Kg.

5.4.11. High yield deform bars steel inforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level.

1.0. Materials : 1.1. Cold twisted steel bars (high yield strength steel deformed bars) shall conform to M 19. Mild steel binding wires shall conform to M-21.

2.0. Workmanship: 2.1. The specifications of item No. 5.4.10. shall be followed except that the cold twisted steel bars shall

be used with or without hooks at the ends. Deformed bars, without hooks shall, however, comply with relevant anchorage requirements.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 5.4.10 shall be followed.

3.2. The rate shall be for a unit of one Kg.

5.4.13. Extra for additional lift of concrete for all R.C.C. work above floor two level excluding cost of reinforcement.

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1.0. Materials & Workmanship: The relevant specifications of item No. 5.4.1. shall be followed for the work except that the

R.C.C. work shall be done for ground floor i.e. above plinth level to first floor level.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.4.1. shall be followed except that the rate shall be for extra lift above plinth to

floor two level, over and above the rate of concrete at floor two level.

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

5.4.13. (A) Extra for additional lift of reinforcement steel for all R.C.C. work above floor two level.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 5.4. 10. or 5.4.11. as may be applicable, shall

be followed except that the work shall be carried out above floor two level for each floor.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.4.10. or 5.4.11, as may be applicable, shall be followed except that the work shall be carried out above floor two level.

2.2. The rate shall be for unit of one Kg. per floor.

5.6.2. Providing upto floor two level precast cement concrete jali or grill 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregate 6 mm. nominal size.) reinforced with 1: 6 mm. dia. mild steel wire including roughening, cleaning, fixing and finishing in cement mortar 1: 3 and curing complete.

(A) 50 mm. thick (B) 40 mm. thick/(C) 25 mm. thick (D) 75 mm thick. (E) 100 mm. thick.

1.0. Materials: 1.1 Water shall conform to M-1. (2) Cement shall conform to M-3. (3) Sand shall conform to M-6. (4) Mortar

shall conform to M-11 (5) Aggregates shall conform to M-12 (6) Mild steel wire shall conform to M-21 (7) Shuttering shall conform to M-26.

2.0. Workmanship:

It shall be of cement concrete 1 : 2 : 4 (1 cement: 2 coarse sand; 4 graded stone aggregate 6 mm. nominal size), reinforced with 1.6 mm. dia mild steel wire unless otherwise specified. The thickness of jali shall be as specified in the item.

The jali shall be set in position true to line and level before the jambs sills and soffits of the opening are plastered. It shall then be properly cemented with cement mortar 1 : 3 : (1 cement: 3 sand) and rechecked for levels. Finally the jambs, sills and

soffits shall be plastered gripping the Jali uniformly on all sides.

3.0. Mode of measurement and payment:

3.1. The item shall be measured in square metre.

3.2. The rate shall be for 1 unit of one square metre.

5.8.1. Providing and laying controlled concrete M-150 and curing complete excluding the cost of form work and reinforcement concrete work in:

(A) Foundations, footings, base of columns, and mass concrete. (B) Walls from top of foundations/level upto floor two level.

(C) Slabs, landing shelves, Balconies, lintels, beams, girders, and cantilever, upto floor two level, (D) Columns, pillars, posts,

and struts upto floor two level (E) Staircase upto floor two level. (F) Vertical and horizontal fins upto floor two level.

1.0. Materials : 1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8 Coarse aggregate shall conform M-12 B.

2.0. General :

2.1 The relevant specifications of item No. 5.4.1. of ordinary concrete shall be followed except that the concrete mix shall be

designed from preliminary tests, the proportioning of cement and aggregates shall be done by weight and necessary precautions shall be taken in the production to ensure that the required work cube strength is attained and maintained. The controlled concrete shall be in grades of M-100, M-150, M-200, M-250, M-300, M-350, & M-400, with prefix controlled added to it. The letter 'M' refers to mix and numbers specify 28 days works cube compressive strength of 150 mm. cubes of

the mix expressed in Kg./Cmt.

2.2 The porportion of cement, sand and coarse aggregates shall be determined by weight, the weight batch machine shall be

used for maintaining proper control over the porportion of aggregates as per mix design.

The strength requirements of different grades of concrete shall be as under:

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Grade of Concrete Compressive strength of 1 5 cms.

28 days, conducted in accordance

Preliminary test Work test

Min.

cubes in Kg./Cmt. at

with I.S. 516-1959.

Min.

M-150 200 150

M-200 260 200

M-250 320 250

M-300 380 300

M-350 440 350

M-400 500 400

In all cases, the 28 days compressive strength specified in above table above be the criteria for acceptance or rejection of the concrete.

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

which its strength lies.

3.0. Workmanship :

3.1. 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 means available except where it can be shown to the satisfaction of

the Engineer-in-charge, that the supply of properly graded aggregate of uniform quality can be maintained till the completion

of work. Grading of aggregate shall be controlled by obtaining the coarse aggregates, in different sizes and beingint hem in

the right proportions as required. Aggregate of different sizes shall be stocked in separate stock piles. The required quantity of material shall be stock piled several hours, preferably a day before use. The grading of coarse and fine aggregate shall be checked as frequently as possible, the 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.

3.2. 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 weighted separately to check the net weight. Where cement is weighted from bulk stocks at site and not by bags, it shall be weighted separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipments shall be maintained in clean, and serviceable condition. Their accuracy shall be periodically checked.

3.3. 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 content. For determination of moisture content in the aggregates, I.S. 2389 (Part-III) shall be referred to. Suitable adjustments also be made in the weights of aggregates due to variation in their moisture content. Minimum quantity of cement used in concrete shall not be less than 220 Kg./M³ in plain concrete and not less than 250 Kg/M³ in reinforced concrete.

4.0. Mode of measurement and payment:

4.1. The relevant specifications item No, 5.4.1. shall be followed except that the controller concrete R.C.C. work for work as specified in item shall be measured under this item. The rate excludes cost of form work.

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

5.8.2. Providing and laying controlled cement concrete M-200 and curing complete, excluding the cost of form work and reinforcement for reinforced concrete work in :

(A) foundations, footings, base of columns and mass concrete. (B) walls from top of foundation upto floor two. level, (C) Slabs, landing, shelves, balconies lintels, beams, girders and cantilever upto floor two level.. (D) Columns, pillars posts and struts upto two level. (E) Stair cases upto floor two level. (F) Vertical and horizontal fins upto floor two level.

1.0. Mode of measurement and payment:

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The relevant specifications of item No. 5.8.1. shall be followed except that the grading of concrete shall be controlled concrete M 200 grades for the work as specified in item.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.8.1. shall be followed.

2.2. The rate shall be for one cubic metre.

5.8.3. Providing and laying controlled cement concrete M-250 and curing complete excluding the cost of reinforcement for reinforced concrete work in :

(A) Foundations, footings, bases of columns and the like and mass concrete (B) Walls from top of foundation level upto floor two level (C) Slabs, landings shelves, balconies, beams, girders and centilever upto floor two level. (D) Columns, pillars, struts upto two level.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed except that the grading of concrete shall be controlled concrete M-250 grades for the works as specified in the item.

2.0. Mode of measurement and payment:

2.1 The relevant specifications of item No. 5.8.1. shall be followed.

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

5.00.1. Providing and laying ordinary cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 graded stone aggregates 20 mm. nominal size) and finishing smooth with curing etc., complete including the cost of form work but excluding the cost of reinforcement of R.C.C. work in :

(I) Slabs upto 8 cms. thickness (II) Slab having more than 8 cms. and upto 10 cms. thickness (III) Slab having more than 10 cms. and upto 13 cms. thickness. (IV) Slab having more than 13 cms. and upto 15 cms. thickness.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 5.4.1. shall be followed for concrete work and

relevant specifications of item No. 9.1 shall be followed for form work and centering work. The concrete surface shall be smooth finished in cement mortar 1 : 3 (1 cement: 3 fine sand) as per item No. 17.59 (1). The thickness of the slab shall be as specified in the item.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item 5.4.1. shall be followed except that the item includes cost for providing form-work

and centering work as directed.

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

5.002. Providing and laying controlled cement concrete M-150 and finishing smooth with curring etc. complete including the

cost of form work but excluding the cost of reinforcement for R .C .C. work in:

(I) Slabs upto 8 cms. thickness (II) Slabs more than 8 cms. and upto 10 cms. (III) Slabs more than 10 cms. and upto 13 cms.

(IV) Slabs more than 13 cms. and upto 15 cms.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed for concrete work and

item no. 9.1 shall be followed for form work and centering. The concrete surface shall be smooth finished with cement mortar

1: 3 (1 cement, 3 fine sand) as per item No. 17.59 (1). The thickness shall be as specified in the item.

2.1. Mode of measurement and payments :

2.1. The relevant specifications for item No. 5.8.1. shall be followed except that the item shall include the cost and form work

and centering.

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

5.003. Providing and laying ordinary cement concrete 1:2:4 (1 cement, 2 coarse sand, 4.graded stone aggregates 20 mm. nominal size) exposed work with curing etc. complete, including the cost of form work but excluding the cost of

reinforcement for R.C.C. work in (I) Slab upto 8 cms. thickness (II) Slabs having more than 8 cms. and upto 10 oms.

thickness. (III) Slabs having more than 10 cms. and upto 13 cms. thickness (IV) Slabs having more than 13 cms. and upto IS

cms. thickness.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.4.1. shall be followed for concrete work and

that of form work, and centering work shall be followed as per item No. 9.1. and 9.7. The thickness of the slab shall be as specified in the item.

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2.0 Mode of measurements and payment:

2.1. The relevant specifications of item No. 5.4.1. shall be followed except that form work and centering work shall be included in the item.

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

5.004. Providing and laying controlled cement M-150 exposed work with curing etc. complete including the cost of form work but excluding the cost of reinforcement for R.C.C. work in:

(I) Slabs upto 8 cms. thickness (II) slabs having more than 8 cms. and upto 10 cms. thickness. (III) Slabs having more than 10

cms. and upto 13 cms. thickness (IV) Slabs having more than 13 cms. thickness.

1.0 Materials & Workmanship: 1.1. The relevant specifications of item No. 5.4.1. shall be followed for controlled concrete

and the relevant specifications of item No. 9.1. and 9.7. shall be followed for exposed concrete form work and centering work. The thickness of the slab shall be as specified in the item.

2.0 Mode of measurements and payment:

2.1. The relevant specifications of item No. 5.8.1. shall be followed except that the form work and centering work shall be included in the item.

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

5.005. Providing and laying ordinary cement concrete 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) for R.C.C. lintel including finishing smooth with curring etc. complete including the cost of form work but excluding the cost of reinforcement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 5.4,1. shall be followed for concrete work, relevant specifications of item No. 17.59 (I) for finishing work and relevant specifications of item No. 9.1 shall be followed

for form work and centering work. The concrete work shall be followed for the form work and centering work for exposed concrete work.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.8.1. shall be followed except that the item includes the cost of form work and centering work for exposed concrete work.

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

5.006. Providing and laying ordinary cement concrete 1:2:4(1 cement: 1 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and finishing smooth with curing tie. complete including the cost of form work but excluding reinforcement for R.C.C. work in:

(A) **Beams :** (I) Having cross sectional area 0.05 to 0.08 Sq. metre (II) Haying cross sectional area more than 0.08 Sq. mt. upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. upto 0.18 Sq. mt.

(B) **Columns :** (I) Having cross sectional area 0.05 to 0.08 Sq. Mt. (II) Having cross sectional area more than 0.08 Sq. mt.

and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq.mt. and upto 0.18 Sq. int.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.4.1. shall be followed for concrete work and

item No. 9.1 shall be followed for form work and centering work. The finishing shall be done in cement mortar 1: 3 (cement :

3 fine sand) as per item No. 17.59 (I). The cross sectional area of beam shall be specified in item.

2.0. Mode of measurements and payment:

2.1 The relevant specifications of item No. 5.4.1. shall be followed but the form work and centering work shall be included in the item.

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

5.007. Providing and laying controlled cement concrete M-150 exposed work with curing etc. complete including the cost of

form work but excluding the cost of reinforcement for R.C.C. work in :

(A) Beams: (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II) Having cross sectional area more than 0.08 Sq. mt. upto

0.12 Sq. mt. (III) Having cross-sectional area more than 0.12 Sq.mt. upto 0.18 Sq.mt.

(B) Columns: (I) Having cross sectional area of 0.05 to 0.08 Sq. mt. (II) Having cross sectional area more than 0.08 Sq. mt.

and upto 0.12 Sq.mt. (III) Having cross sectional area more than 0.12 Sq.mt. and upto 0.18 Sq.mt.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed for controlled concrete

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work for work as specified in item for M-200 and relevant specifications of item 9.1 and 9.7 shall be followed for the form work and centering work for exposed cement work.

2.0. Mode of measurements and payment:

2.1 The relevant specifications of item No. 5.8.1. shall be followed excepted (hat the form work and centering work shall be included in the item.

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

5.008. Providing and .laying contralcd cement concrete M-200 exposed work with curing etc. complete including the cost of

form work but excluding the cost of reinforcement for R.C.C. work in

(A) Beams: (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II) Having cross sectional area 0.08 Sq. mt upto 0.12 Sq. ml. (III) Having cross sectional area 0.12 Sq. mt. upto 0.18 Sq. mt.

(B) Columns : (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II) Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. and uplo 0.18 Sq. mt.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed for controled concrete

work as specified in item for M-200 and relevant specifications of item 9.7 and 9.1 shall be followed for the form work and

and

centering work for exposed cement work.

2.0. Mode of measurements and payment:

2.1 The relevant specifications of item No. 5.8.1. shall be followed except that item includes the cost of form work and centering work for exposed work.

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

5.009. Providing and laying controlled cement concrete M- 250 exposed work with curing etc. complete including the cost of form work tut excluding the cost of reinforcement for R.C.C. work in

(A) Beams : (I)Having cross sectional area 0.05 to 0.08 Sq. ml, (II) Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. and upto 0.18 Sq. mt.

(B) Columns : (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II; Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq.mt. (III) Having cross sectional area more than 0.12 Sq. mt. and upto 0.18 Sq. int.

1.0 Materials & Workmanship : 1.1 The relevant specifications of item No. 5.8.1. shall be followed for controlled concrete

work for the work as specified in the item for M-250 and the relevant R.C.C. lintels shall be carried out.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.4.1. shall be followed except that the cost of form work finishing and centering shall be included in the item.

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

Expansion joints- Premoulded filter:

1.0 .The item provides for expansion joints in R.C.C. frame structures for internal joints, as well as exposed pints, with the use of premoulded bituminous joint filler.

2.0. Premoulded bituminous joint filler, i.e. performed strip of expansion joint filler shall not get deformed or broken by

twisting, bending or other handling when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.

3.0 Thickness of the pre-moulded joint filler shall be 25 mm, unless otherwise specified.

4.0 Premoulded bituminous joint filler shall conform to I.S. 1838-1961

SUBMITTALS

The contractor shall submit the following to the Architect for review and approval well before the commencement of work.

Required approvals from all concerned authorities.

Proposed demolitions and dismantling plans and day-to-day progress schedule showing clearly the sequence of operations for disconnections of building services, controlled operation of services to be retained and safety precautions. This shall be accompanied by description of procedures proposed to be followed.

Equipment proposed to be used for demolition and dismantling.

Proposal for temporary works to partition and protect adjacent or nearby areas in use, including dust control and clean up procedures.

CONTROL OF PROCEDURES AND SAFETY

A Contractor shall devise and be responsible for all procedures to ensure the safety of the building, the workers and the other occupants during the demolition and dismantling work. The work shall at all times be under the direct supervision of experienced foreman under the overall Supervision of the Contractor's Site Engineer. Comply with the requirement of IS-4912 and IS: 13415

HANDLING, STORAGE, TRANSPORTATION AND DISPOSAL

Handled and stored materials retrieved from the demolition and dismantling in accordance with IS: 7969. Wherever there is a conflict in the requirements of IS: 7969 and the provision herein, the more stringent of the specifications shall apply.

Store debris and salvaged material separately in designated places approved by the submittal procedure described above. All salvage material shall be classified and stored separately by categories agreed upon prior to commencement of demolition.

Do not pile up material in a manner that will cause the structure to be over loaded. Stack material so that tacks are stable and do not cause obstruction to movement.

Do not allow debris to accumulate beyond the capacity of the approved area for temporary storage. Do not dump debris in public rights-of-way in private property