

**GOVERNMENT OF CHHATTISGARH
WATER RESOURCES DEPARTMENT**



**SCHEDULE OF RATES
FOR
WORKS OF WATER RESOURCES DEPARTMENT
CHHATTISGARH**

**In Force From
01.08.2010**

**ENGINEER-IN-CHIEF
WATER RESOURCES DEPARTMENT, CHHATTISGARH
RAIPUR**

Price Rs. 1400/-

PREFACE

The schedule of rates for water resources works in Chhattisgarh is in force from 1st December 2003. Normally, the Schedule of Rates is required to be revised once in five years; however this revision has taken place after nearly seven years. A committee, headed by the Engineer in Chief has been constituted by Government of Chhattisgarh for the revision of the SOR. As the rates of Labour, Cement, Steel & P.O.L. etc. were increased abnormally, the committee organized its first meeting in May 2008 for review of SOR 2003. The committee decided that it is essential to revise the rate of SOR 2003 immediately and a task force was constituted for this work. The rate analysis work for items of SOR by computer program was started by Shri S.V. Bhagwat S.E.(A) and later on was taken up by Shri G.R.Lilhare E.E.. Since analysis of all the items was a time taking job, it was decided in the second meeting by the committee to revise rates on percentage basis in the year 2008. As computerisation of rate analysis of almost all the items was completed, the committee in its meeting dated 26th June 2010 decided to issue this Schedule of Rates w.e.f. 1st August 2010.

The main features, which are worth mentioning in the revised SOR are as under:

1. The rates are decided as per analysis and escalation on previous rates.
2. The rate of cement considered for the revision is Rs. 230/- per bag.
3. The rate of mild steel considered is Rs. 33000/- per M.T.
4. Present prevailing rates in respect of Labour, Material & P.O.L. have been considered in the analysis for SOR.
5. Rates for Cement Concrete M20 to M40 are introduced as new items.
6. Some new items are added in chapter no. 2, 10, 11, 12, 14, 25.
7. A New chapter 43, Special Items for Building work is added.

In the chapter dealing with labour rates and daily wages, no rates have been given as these rates are decided by the Labour commissioner. Only the category of unskilled, semiskilled and skilled labours has been shown.

The work of revision of SOR was a voluminous job. The under-signed gratefully acknowledges the initiative, inspiration and counsel given by Shri C.K. Khaitan Secretary, Water Resources Department from time to time without which it would not have been possible to bring this edition of SOR.

I am also grateful to Shri R.N. Mishra C.E. M.G.Basin Raipur, Shri B.L. Rai C.E. H.B. Bilaspur, Shri H.R. Kutare C.E. Mahanadi Project Raipur, Shri Subodh Shrivastav C.E. Hasdeo Bango Project, Bilaspur, Shri A.K. Khare C.E. (M) Raipur, Shri A.K. Agrawal S.E. (B), Shri S.V. Bhagwat S.E. (A), for the contribution extended by them from time to time.

Last, but not the least, I am thankful to Shri G.R. Lilhare E. E. (Bodhi), Shri U.S. Tiwari A. E., Shri Vikas Dube A. E., Shri Homesh Nayak A. E., Shri K.R. Bharat Sub Engineer, and Shri. R.A. Abbasi Sub Engineer who have worked with dedication and with unstinting and relentless efforts to bring out this edition of SOR.

Lastly, I would also like to acknowledge the contributions made by many other officials and staff members of the office of Engineer-in-Chief Raipur who have given assistance directly or indirectly in bringing out this publication.


K.K. Mandhata
Engineer In Chief

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ABBREVIATIONS

The following abbreviations, wherever they appear in the schedule of rates, shall have the meaning of implications hereby assigned to them:-

AC	Asbestos cement	LM	Lime mortar
ASTM	American Society for Testing Materials	LWL	Low water level
BC	Black cotton	m	Meter
BM	Bench mark	M.D.D.	Maximum dry density
BWG	British wire gauge	mm	Millimeter
BT	Black trap	MS	Mild steel
CD	Cross drainage	MTS	Medium tensile steel
0c	Degree centigrade temperature	N/Sq.mm	Newton per Sq. mm
C.C.	Cement concrete	N.D.D.	Natural dry density
CG	Centre of gravity	NMC	Natural moisture content
CGS	Corrugated galvanised sheet	NMR	Nominal muster roll
CI	Cast iron	No (s)	Number (s)
CL	Centre line	NSL	Natural surface level
cm	Centimeter	omc	Optimum moisture content
CM	Cement mortar	PCC	Plain cement concrete
CR	Coursed rubble	POL	Petrol oil and lubricant
cu cm	Cubic centimeter	pt	part
cu M	Cubic meter	PVC	Polyvinyle chloride
cumec(s)	Cubic meter per second(s)	r	radius
Dia	Diameter	Re.	Rupee
DRR	Diesel road roller	Rs.	Rupees
D/S	Downstream	RCC	Reinforced cement concrete
etc.	Etceteras	RL	Reduced level
e.g.	For example	RR	Random rubble
ERW	Electric resistance Welded	RSJ	Rolled steel joist
E/W	Earthwork	SDO	Sub Divisional Officer
Fig.	Figure	Sq.m.	Square Meter
GI	Galvanised iron	SFR	Sheep foot roller
GL	Ground level	SW	Stone ware
HP	Horse power	SWG	Standard wire gauge
i.e.	that is	SWL	Static water level
IRC	Indian Road Congress	TM	Table moulded
IS	Indian Standards	T&P	Tools and plants
ISS	Indian Standards Specification	TW	Teakwood
ITI	Industrial Training Institute	u/s	UP-stream
Kg	Kilogram	Viz.	Namely
KVA	Kilo volt ampere	WBM	Water bound macadam
LDPF	Low density polyethylene film	%	percent

REGISTER OF AMENDMENTS

Amendment No.	No. & date of Ref. Letter.	Pertains to		Brief Particulars of amendments	Ref. To Page No. in which amendment is pasted	Dated initials of the officer making the entry
		Chapter	Item			

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		Chapter	Item			

6. In compliance to para 5 above, the Chief Engineer / Superintending Engineer may announce percentage deductions (or additions) item wise (or chapter wise) and Division wise in respect of the items (or chapter) required to be executed on NMR/Piecework.

The copy of the sanction may be endorsed in the Water Resources Department besides officers of other departments as follows:-

- The Secretary, Water Resources Department, C.G. Raipur.
 - The Concerned Chief Engineers.
 - The Superintending Engineer, Bodhi
O/o Engineer-in-Chief, Water Resources Department, C.G. Raipur
 - The Executive Engineers of the Circle (in 15 copies) for distribution to all concerned in division office.
 - All Sub-Divisional Officers (in 10 copies) for distribution to concerned staff including Sub-Engineers.
7. (a) The general rule of open tender system i.e. invitation of tenders by public advertisement shall be followed in respect of all works costing over Rs. 15,000. For awarding the work on piece work, instructions issued by the Govt. from time to time may be followed.
- (b) The horizontal (depth-wise or height-wise) splitting of work shall not be done for award or work on piecework. The sanction for longitudinal (lengthwise) splitting of work for piecework shall be accorded, when considered desirable, with due regards to junction with other group(s).
8. The sequence of construction of irrigation channel(s) shall be so planned that the works are completed from head to tail. The contract agency, for earthwork and all structures (except direct outlets and railway crossings) on irrigation channels carrying discharge (a) below 0.3 cumec., may be fixed in one group and (b) 0.3 to 1 cumec (and also for 1 to 3 cumec) discharge may be fixed in one group or groups in multiple of 3k.m. length or for length as considered suitable.
9. The nomenclature of items given in the schedule of rates should not be deviated and should be followed as they are. It is important that the deviation can be done only for items, which do not find place in the schedule of rates. For example, the rate for boulder collection cannot be derived by deduction the labour rates for boulder toe from the rate of completed item of boulder toe because the rate for boulder collection already exists under chapter 5 "Collection of Materials".
10. The Royalty for extraction of material is to be as per the rates fixed by the State Government which are inclusive of rates.
11. Rates as prevalent in April 2010 :-

S.No.	Labour	Unit	Rate in Rs per day
1	Unskilled	1	116.26
2	Semi skilled	1	119.86
3	Skilled	1	123.53

S.No.	Material	Unit	Rate in Rs.
1.	Cement including cost of container (each bag will be deemed to contain 50 kg of cement).	Bag	230.00
2.	Mild steel	tonne	33000.00
3.	Cold worked deformed bars	tonne	33000.00
4.	Structural steel	tonne	35000.00
5.	High tensile steel	tonne	35000.00
6.	Copper sheets	kg	800.00
7.	Electric detonator	each	10.00
	Fuel		
8.	Diesel	Lit	36.69
9.	Petrol	Lit	49.10

If the issue rates of above materials/Fuels (S.No. 1 to 11) are higher than the rates given above, the provision for extra cost of these materials shall be made in the estimate. For percentage rate tender, the issue rate of cement shall be applicable as specified in schedule of rates.

12. Whenever some or all the materials are supplied by the Department, it will be open to the authority inviting tenders to specify clearly whether rates are to be quoted for completed items or only for labour charges.
13. Rates provided in the schedule are based on availability of water from tap or well or natural sources. If water is not available within 100-m provision shall be made in the estimate for lead of water as provided in the schedule. This will, however, not be payable on contract works (percentage rate tender or item rate tender or piecework or lump sum contracts) as a separate item.

In case of item rate tenders, the provision made for extra water lead charges can be considered while arriving at the estimated rate of each item of the schedule of quantity of the items put to tender as this would not result in payment of extra water lead as a separate item.

14. The items of work to be adopted for execution of works shall be based on design requirements and type of works.

For example:-

- (a) The steel reinforcement shall be of the type provided in the design, if not available the structure may be redesigned taking into consideration the stresses of the type of steel to be used so that permissible stresses may develop in concrete and reinforcement.
- (b) The circular issued by the Superintending Engineer, Bodhi O/o Engineer-in-Chief, Water Resources Department, Raipur regarding use of various types of strength concrete in foundation and super structure of dam, bridges, and buildings should be followed. Strict quality control should be ensured. However, on small works nominal mix for concrete can be used, with prior written permission of the Chief Engineer / Superintending Engineer.

- (c) For buildings, the chimney burnt bricks involving longer leads shall be normally used only when design considerations warrant with the written permission of the Chief Engineer / Superintending Engineer.
15. (a) Work shall be executed strictly in accordance with the specifications issued by Bodhi from time to time.
- (b) Wherever any reference is made to any IS in the schedule it shall be taken as reference to the latest edition with all amendments issued thereto.
16. The controlled concrete of various grades (M10, M15, M20, M25) shall conform to IS : 456-2000 (third revision). Letter M refers to the mix and number to the specified characteristic compressive strength of 15-cm cube at 28 days, expressed in N / mm².
17. For better quality control on works necessary field/laboratory tests shall be carried out as specified in Appendix XII – “List of mandatory tests”.
18. In the interpretation of description of items or rates of the schedule of rates and specifications, the decision of the Engineer in Chief shall be final.
19. The estimates for works should be prepared on the basis of schedule of rates (S.O.R.) for comparison of tendered rates with common datum throughout the department.
20. The labour rates adopted for preparation of S.O.R. are exclusive of provision for weekend holiday.
21. The rates given in the schedule of rates are in Indian Rupees and Paisa.
22. Pozzolona cement is now being widely produced all over country. This may be used for canal lining and Hydraulic Structures in contact with water as per I.S. code. In specific cases requiring higher grade of strength, use of Ordinary Portland Cement (OPC) should be invariably ensured.

CHAPTER 1 – LABOUR RATES AND DAILY WAGES

Notes :-

1. (a) Labour rates, to be paid will refer to the class of work done and not to the person employed.
- (b) The daily labour rates shall be arrived at by dividing the monthly rate by 30 and the quotient so arrived at after being rounded off to the next 10 paise, shall be the daily rate exclusive of remuneration for weekly holiday. Hence separate payment shall be admissible for week-end-holiday.
2. The rates for skilled labour are inclusive of necessary tools which are normally carried by them, for carrying on their profession. The carpenter should bring all carpentry tools such as handsaw, pliers, square, drill, scale etc. mason should bring shovel, plumb bob thread and spirit level, bar bender should bring chisel and hammer, bar binder should bring pliers and wire twisting tool and artist should bring all required brushes for precision work. These examples are illustrative and not exhaustive.
3. The total wages payable to each labour on NMR shall be rounded off to the nearest rupees.
4. (a) The rates are for a working day of eight hours unless specified otherwise.
- (b) In exceptional circumstances where work has to be continued beyond 8 hours in a day, the payment for over-time should be on hourly basis at double the hourly rate worked out from normal daily wages of 8 hours. Prior sanction of the Executive Engineer should be obtained, wherever possible, failing which urgent intimation should be given to the S.E. / E.E. before the work is actually started. Written confirmation of EE's approval to the work should invariably be obtained from C.E./ S.E. immediately after the start of such emergent works.
5. The rates for hiring cart or truck on Km basis should be paid only when :-
 - (a) The article or articles transported are not one full cart load (half - tonne) or one full truck load (seven-and-a-half-tonne) but are less than that too in emergency when departmental truck is not available, with the written permission of the Executive Engineer.
 - (b) Such articles are transported for which there is no rate available in the schedule of rates.
6. (a) Where more that one grade have been given, the Assistant Engineer is empowered to engage labour of Grade II and Grade III categories. For engagement of Grade I category prior sanction of the Executive Engineer should be obtained.
- (b) Grade-I, rates are for persons having experience of more than 5 years in the trade.
- (c) Grade-I Carpenter / Mason / Plumber shall be engaged for following works-
Carpenter-For door/ window/ frames, shutters and similar types of work.

Mason - for cut stone work, first class brick masonry, face stone masonry (for dams) and similar types of work.

Plumber - for sanitary fittings, sewerage work and superior fittings.

- (d) For engaging Diver and Well Sinker prior sanction of the Chief Engineer/ Superintending Engineer should be obtained.
7. Wherever monthly scales have been fixed by the State Government, the labour should be ordinarily employed for not more than one month but the period can be extended by the Executive Engineer up to 89 days beyond which approval of the Chief Engineer/ Superintending Engineer shall be necessary.
 8. For underground works involved in tunnels, shafts, surge shafts, audits and drifts the rates of labour deployed should be up to 50% above the normal labour rates.
 9. The daily labour rates, for various categories of labour provided in this chapter, shall be sanctioned by the Superintending Engineers for works under their circle within the limits of the revenue division in accordance with the rates, fixed from time to time by the committee, constituted by the State Government vide their labour department notification No.4/C/16/18 labour 16, dated 16-11-1978 under the chairmanship of divisional commissioner and shall be enforced from the date notified by the said committee.

The copy of the sanction may be endorsed in the Water Resources Department besides officers of other department as follows:-

The Secretary, Water Resources Department, C.G. Raipur.

The concerned Chief Engineer.

The Superintending Engineer Bodhi, O/o Engineer-in-Chief, Water Resources Department, C.G., Raipur.

The Executive Engineers of the Circle (in 15 copies) for distribution to all concerned in division office.

All Sub-Divisional Officers (in 10 copies) for distribution to concerned staff including Sub-Engineers.

10. The following Acts of the Central Government with latest amendments thereto and rules made there under may be referred to :-
 - Minimum Wages Act, 1948
 - Workman's Compensation Act, 1928
 - Contract Labour (Regulation & Abolition) Act, 1970

Item No.	Category	Remarks
Unskilled :		
101(a)	Grade "A"	(1) Mate or Head Mazdoor, (2) Asstt, Boatman, (without boat) (3) Asstt. Cook, (4) Asstt. Line man. (5) Bar Binder, (6) Bhishty with mashak, (7) Blow boy (adult), (8) Chowkidar, (9) Cleaner or Conductor or Helper (for trucks and heavy transport vehicles) (10) Fireman, (11)Gauge reader, (12) Gardner Gd.II. (13) Helper to plumber, (14) Oilman Gd.I (for rated machinery), (15)Pump Attendant (not operator), (16) Saw man or Helper to Carpenter, (17) Store Attendant, (18) Switch Board Attendant, (19) Tar Handler, (20) Watchman.
101 (b)	Grade "B"	(1) Mazdoor (Male or Female). (2) Dak Runner, (3)Khallasi (4) Oilman Gd. II (for non-rated machinery (5) Rig man or Mast man for Drilling unit, (6) Sweeper (7) Waterman.
101 (c)	Boy or Girl Mazdoor (not below 14 years)	
102	Semi skilled	(1)Asstt. Fitter, (2) Asstt. Moulder, (3) Asstt. Welder (4)Auger man, (5) Bandhani with implements, (6)Boatman (without boat) (7) Cane weaver, (8)Cobbler, (9) Elec. Fitter (10) Field Asstt. Abhiyana/Soil testing (Metric) (11) Floor polisher, (12) Gardner Grade II(Trained) (13) Gauge reader (Metric), (14) Glazier, (15) Hammer or Crowbar man (16) Laboratory Technician Gd.-II (Metric). (17) Pneumatic Hammerman; (18)Tar sprayer, (19)Tile Turner, (20)Timekeeper (Metric) (21) Tool Mistry
Skilled :		
103 (a)	Grade "A"	(1) Artist for Models and Charts, (2)Black smith Gd.I (3)Carpenter Gd.I (4) Cook, (5) Electrician-Auto Diesel (rated equipment), (6) Mason Gd.I, (7) Plumber Gd.I, (8)Shovel dragline Operator Gd.I (9) Senior Mechanic (for workshop), (10)Special Gate Mechanic.
103 (b)	Grade "B"	(1) Asstt. Electrician, (2) Compressor/Crusher Operator Gd.I, (3) Core Drill Operator Gd.I, (4) Driller Gd.I, (5)Driver (6)Dumper Operator Gd.I, (7)Mechanic (for workshop), (8)Gate mechanic Gd.I (9) Fitter Gd.I. (10)Operator for truck trailor, (20-tonne and above) (11)Pump Operator Gd.I (for pumps of above 100 HP) (12)Research Assistant (M.Sc./B.Sc. Ist Division), (13)

Item No.	Category	Remarks
103 (c)	<p>Rigour labour, (14) Scrapper or Dozer Operator Gd.-I, (15) Shovel/Dragline Operator Gd.II, (16) Tractor Operator Gd.-I(chain type), (17)Turner Gd.-I, (18)Upholstery maker (19)Well sinker, (20)Wireman (overhead), (21)Wireman (underground work) Gd.I</p> <p>Grade "C"</p> <p>(1) Black smith Gd.II, (2) Blaster (License holder). (3) Bench Fitter, (4) Carpenter Gd.II, (5) Compressor/ Crusher Operator Gd.II. (6)Core Drill Operator Gd.II, (7) Driver for light vehicles, (8)Driver for truck,(9)Driller Gd.II, (10)Driller-Jack Hammer, (11) Dumper Operator Gd.II (12) Fitter Gd.II,(13)Gate Mechanic Gd.II, (14)Generator Operator Gd.I, (15)Laboratory Technician Gd.II (B.Sc.), (16)Mason Gd.II (17)Mixer Operator, (18)Moulder Gd.I (19)Painter Special Grade (20)Plumber Gd.II, (21)Pump Operator Gd.II (for pumps of 25 to 100 H.P.) (22) Road roller Driver (Diesel/Steam), (23)Scrapper/Dozer operator Grade II, (24)Tailor with machine, (25)Tractor operator Grade II (Chain type), (26)Turner Grade II, (27)Tractor operator (Wheel type), (28)Vibrator operator, (29)Welder Gradel, (30)Wire man (Industries), (31)Wireman (under ground work) Grade II.</p>	<p>S. No. (19) to be employed for higher quality figuring or lettering.</p>
103 (d)	<p>Grade "D"</p> <p>(1)Amin (Qualified) (2)Asstt. Electrician. (3)Asstt. Mechanic, (4)Asstt. Wireman, (5)Bar Bender (6)Bench Fitter, (7)Carpenter Gd.III (8)Compressor/Crusher Operator Gd.II (9) Driller Gd. III, (10)Generator Operator Gd.II (11) Mason' Gd.III, (12)Moulder Gd. II (13)Painter Gd.I (14)Pump Operator Gd. III (for pumps below 25HP), (15)Supervisor, Survey Attendant (ITI Certificate holder). (16)Thatcher, (17) Tracer (qualified), (18) Tubewell Operator, (19) Welder Gd. II, (20)Wireless/Telephone Operator, (21)Wireman (Domestic), (22)White or Colour Washing Mason, (23)Wood Polisher.</p>	

CHAPTER 2 – SURVEY AND INVESTIGATION

Notes :-

1. Survey shall be carried out departmentally and labour will be provided on labour contract / N.M.R. as per orders issued by Govt. from time to time. The progress of labour employed shall be checked with rates given in this chapter and if it is found necessary to carry out survey on tender, it can be done with prior approval of chief engineer.
2. Length of the survey will be measured along the lines on which particular type of survey is to be done. For example, for chain and compass survey, it would be the length along which the chaining and compassing is to be done. For levelling, it would be the total length of the lines along which levels are to be taken.
3. (a) The rate are based on the following average daily progress that can be normally achieved under average conditions by one survey party :-

Item	Head works	Canals
Chain and compass survey	2 km	3 km
Levelling (above 15 m interval)	2 km	2.5 km

- (b) The labour strength of one survey party for chain and compass survey considered in (a) above is 12 mazdoors (3 for ranging, 1 for preparing pegs, 1 pegman, 2 chainmen, 1 compass man, 2 axemen for removing obstacles, 1 waterman and 1 watchman for watch and ward of camp).

For leveling (above 15m interval) the labour strength considered is 8 mazdoors (2 chain and tape man, 1 staff man, 1 instrument man, 1 umbrella man, 1 waterman and 2 axe men for removing obstacles).
 - (c) In very difficult terrain and special circumstances where the progress may be less special sanction for the rate should be obtained from the Superintending Engineer and the provision for the same be made in the estimate.
4. (a) The items against which multiplying numbers suffixed by “R” have been given in the rates column, the payable rates on NMR shall be arrived at as per following formula –

$$\text{Payable rate (in Rs)} = R \times \text{Current labour rate (in Rs)}$$

For example if Rs. 116.26 is the current labour rate for unskilled mazdoor, the payable rate for item 205 (a) will be $6 \times \text{Rs.}116.26 = \text{Rs.} 697.56$ per km. Say Rs. 697.60 per km.

 - (b) In (a) above, the current labour rate shall be the daily labour rate of unskilled mazdoor applicable in the area at the time of execution of work.
 - (c) The categories of labour other than unskilled mazdoor may also be engaged wherever required but the maximum payable rate shall not exceed the amount arrived at as per (a) above. The rates so arrived at shall be rounded off to the next rupee.

- (d) The multiplying numbers given under this chapter are exclusively for Survey and investigation work.
5. (a) The rate for item 202(6) does not include the cost of blasting materials.
- (b) When depth of the trial pit or trial trench exceeds 1.5 times the top width, 10% extra rate shall be payable for 202(1) to (7) as per item 202(10)
6. (a) The theodolite shall invariably be used for survey and setting of curves for irrigation channels carrying discharge above 1 cumec and layout of important structures etc.
- (b) The chaining of final alignment shall be done with due precision preferable after setting of curves.
- (c) The surveyed alignments and cross-sections shall also be marked on village maps.
- (d) The cross-sections for catchments area survey may be taken at 150m interval. The ridgeline and cross-sections may also be marked on village maps for computation of catchments area.
- (e) The survey party for double leveling shall be headed by the S.D.O.
- (f) While checking progress of NMR/contract work, the completion of plotting, wherever required shall also be ensured.
7. The items 211 and 212 shall be payable, when construction of temporary approach road is considered necessary by the Chief Engineer/ Superintending Engineer. Prior written sanction of the Chief Engineer/ Superintending Engineer is necessary which will include the width (2.5m or 3.8m) and type (non-hilly or hilly terrain) of road in different lengths as considered necessary.
- (a) For execution of item 215, one Sub Engineer Unit may engage a maximum of one Amin. (Qualified) or Survey Attendant (ITI certificate holder), One field Asstt. Abhiyana (Metric) or Time-Keeper (metric) and 3 mazdoors, item 215 shall be executed on prior written sanction of the Chief Engineer/ Superintending Engineer, specifying the number of Sub-Engineer units in each Sub Division and the period for which they are to be engaged which shall be issued by first week of proceeding month quarter wise (Jan. to March, April to June, July to Sept. and Oct to Dec.) after assessment of work.
8. To carry out survey for item number 204 to 207 by Total Station Electronic Instrument the rates will be increased by 15% for Computer Engineer, other computer staff, computer stationary & plotting by computer as directed by Engineer-In-Charge & additional 10% for profit of the contractor.
9. The following Indian Standards may be referred to :-

IS No.	Title
273-1990	Picks and beaters (Third revision) reaffirmed 2006
1492-1970	Metric surveying chains (first revision) (with 2 amendments) (Reaffirmed 1998)
1759-1986	Powrahs (Second revision) reaffirmed 2002

1779-1961	4-Metre levelling staff, folding type (reaffirmed 2006)
1842-1961	Surveying chain pins (arrows) (reaffirmed 2006)
1955-1961	Prismatic compass, liquid (Reaffirmed 2006)
1957-1961	Prismatic compass , non-liquid (reaffirmed-2006)
2288-1963	Ranging rods (reaffirmed 2006)
2976-1964	Optical theodolite (reaffirmed 2000)
2988-1995	Venire theodolite (with 3 amendments) (reaffirmed 2007)
4080-1994	Specification for Vertical staff gauges. (reaffirmed 2000)
4590-1980	Secondary level (First revision) (reaffirmed 2006)
5497-1983	Guide for topographical surveys for river valley projects. (reaffirmed 2005)
5510-1969	Guide for soil survey for river valley projects (reaffirmed 2005)
8330-2004	Telescopic tripod for surveying instruments.

Item No.	Item	Unit	Rate	Remarks
201	Dag-belling in all types of soil :			
	(a) Single spade stroke (minimum 75 mm deep)	m	0.02 R	
	(b) Double spade "V" shaped stroke (100 mm deep)	m	0.03 R	
202	Trial pit or trial trench excavation as per various items of chapter 4 :-			
	(1) Item 401 (a)	cum	0.55 R	
	(2) Item 401 (b)	cum	0.75 R	
	(3) Item 402	cum	1.00 R	
	(4) Item 403	cum	2.00 R	
	(5) Item 404	cum	3.20 R	
	(6) Item 405 (a)	cum	4.70 R	
	(7) Item 405 (b)	cum	6.60 R	
	(8) Item 407 (a) (iv)	cum	0.50 R	
	(9) Item 407 (b) (iv)	cum	0.68 R	
	(10) Item 410	cum	10% of item 202 (1) to 202 (7)	
	(11) Item 411 (a)	cum	30% of item 202 (1) to 202 (3)	

Item No.	Item	Unit	Rate	Remarks
	(12) Item 411 (b)	cum	8% of item 202 (4) to 202 (7)	
	(13) Item 412	cum	0.04 R	
	(14) Item 413	cum	0.06 R	
	(15) Item 414	sq.m	0.08 R	
	(16) Item 416 (a)	cum	0.04 R	
	(17) Item 416 (b)	cum	0.11 R	
	(18) Item 416 (c)	Cum	0.15 R	
	(19) Item 416 (d)	Cum	0.20 R	
	(20) Item 416 (e)	Cum	0.25 R	
203	Boring holes with auger in all types of soil up to 5 m depth below G.L. including collecting samples :-			
	(a) 200 mm dia	M	1.30 R	Augers will be supplied by the Deptt.
	(b) 250 mm dia	M	1.70 R	
	(c) 300 mm dia	M	2.00 R	
204	(a) Chain and compass survey			
	(i) Headworks -	Km	6.00 R	
	(ii) Canals	Km	4.00 R	
	(b) Chain and the odolite survey :-			
	(i) Headworks	Km	6.00 R	
	(ii) Canals	Km	4.00 R	
	(c) Theodolite work involving fixing of stones at every tenth chain, tangent, apex and vertex point of final alignment	Km	12.00R	
205	Fly levelling for fixing temporary bench marks :-			
	(a) Up to 15m interval	Km	6.00 R	
	(b) Above 15 m interval	Km	3.00 R	
206	Levelling :-			
	(a) Headwork			
	(i) below 5 m interval	Km	10.00 R	For basin survey and dam seat survey.

Item No.	Item	Unit	Rate	Remarks
	(ii) 5 to 10 m interval	Km	8.00 R	
	(iii) more than 10 but up to 15m interval	Km	6.00 R	
	(iv) above 15m interval	Km	4.00 R	
	(b) Canals -			
	(i) below 5 m interval	Km	8.00 R	For command survey and canal survey, including survey for C.D. woks
	(ii) 5 to 10 m interval	Km	6.40 R	
	(iii) more that 10 but up to 15m interval.	Km	4.80 R	
	(iv) above 15m interval	Km	3.20 R	
207	Double levelling for transfer of bench marks-			
	(a) up to 15m interval	Km	24.00 R	
	(b) above 15 m interval	Km	12.00 R	
208	Standard bench marks as per type design 8 of water Resources Deptt :-			
	(a) Providing MS plate of size 12x1 2x0.6cm and 2 Nos. anchor bolts of 10 mm dia and 30cm length including shaping and welding etc., complete.	Each	48.00	Drawing enclosed vide Appendix- Iv
	(b) Cost of cement, metal and sand (for 0.13 cum 1:2:4 cc)	Each	338.00	
	(c) Labour for excavation (any type of soil) mixing, laying and curing of concrete including erection and removal of form work and fixing of MS plate.	Each	5.00 R	
	(d) Cost of water for mixing and curing of concrete	Each	2.00R	
209	White washing and figuring of benchmarks as per type design 7 of Water Resources Department.	Each	50.00	Drawing enclosed vide Appendix V
210	Benchmark as per type design 6 of Water Resources Department.			Drawing enclosed vide Appendix VI
	(a) Bench mark stone of size 15x15x75 cm of 1:2:4 RCC including cost of steel	Each	119.00	
	(b) Erection and fixing (embedding 45 cm depth of stone with 15cm concrete all around and in bottom) -			

Item No.	Item	Unit	Rate	Remarks
	(i) cost of cement, metal and sand (for 0.11 cum 1:3:6 C.C. with 40mm graded metal)	Each	236.00	
	(ii) Labour for excavation (any type of soil), handling and fixing of B.M. stone including mixing, laying & curing of concrete.	Each	2.00 R	
	(iii) cost of water for mixing and curing of concrete	Each	1.00 R	
211	Construction of temporary approach road of 2.5 m average width for survey vehicles, involving cutting of field boundaries, providing ramps at depressions and touching the uneven surface and jungle clearance -			Payable only with the prior written approval of the Cheif Engineer.
	(a) In non-hilly terrain	Km	50.00 R	
	(b) Hilly terrain	Km	100.00 R	
212	Construction of temporary approach road of 3.8m average width for survey vehicles, involving cutting of field boundaries, providing ramps at depressing and touching the uneven surface and jungle clearance-			Payable only with the prior written approval of the Superintending Engineer.
	(a) In non-hilly terrain	Km	75.00 R	
	(b) Hilly terrain	Km	150.00 R	
213	Providing and fixing centre lines stone -			
	(a) Precast 1:2;4 RCC 20 mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete,	Each	96.00	
	(b) Embedding 30cm depth of stone with 15 cm concrete all around and in botton (0.09 cum 1:3:6 c.c. with 40mm graded metal)-			
	(i) cost of cement, metal and sand	Each	178.00	
	(ii) Labour for excavation (any type of soil), handling and fixing of stone including mixing laying and curing of concrete.	Each	1.50 R	
	(iii) Cost of water for mixing and curing of concrete.	Each	0.50 R	

Item No.	Item	Unit	Rate	Remarks
214	Catchment area survey-			
	(a) Chain and compass survey along ridge line	Km	6.00 R	
	(b) Levelling along ridgeline and corss – sections.	Km	Same as per item 206(b)	
215	Survey for Govt. or private buildings Kachha, pucca houses or wells including taking detailed measurements thereof, measuring components like fencing etc., and entering in register, sketching, if required, noting specifications for foundation plinths, superstructure, roofing, flooring and doors and windows etc., directly at site.	Day	As per Note 7A	
216	Resistively survey for selection of site for Dug well/Tube well Dug cum bore well including all required material/equipment, transportation of all connected items for three sounding at one site.	1 site	2300.00	
217	Labour only for item 216 for Resistively survey work for selection of site for Dug well/Tube well/Dug cum bore well for three soundings at one site.	1 site	9.00 R	
218	Testing of water sample for 26 parameters including required chemicals, glass ware and equipments.			
(i)	Electrical conductivity	per sample	76.00	
(ii)	Total dissolved solid	per sample	123.00	
(iii)	PH	Per sample	76.00	
(iv)	Sodium	Per sample	243.00	
(v)	Pottasium	Per sample	243.00	
(vi)	Turbidity	Per sample	72.00	
(vii)	Sulphate	Per sample	172.00	
(viii)	C.O.D.	Per sample	404.00	

Item No.	Item	Unit	Rate	Remarks
(ix)	Nitrate (NO ₃)	Per sample	248.00	
(x)	Flouride	Per sample	188.00	
(xi)	Nitrite (NO ₂)	Per sample	251.00	
(xii)	Phosphate	Per sample	253.00	
(xiii)	Silicate	Per sample	260.00	
(xiv)	B.O.D.	Per sample	630.00	
(xv)	Total Suspended Solid	Per sample	123.00	
(xvi)	Dissolved Oxygen	Per sample	105.00	
(xvii)	Free Carbon Dioxide	Per sample	125.00	
(xviii)	Carbonate	Per sample	125.00	
(xix)	Bicarbonate	Per sample	126.00	
(xx)	Total Hardness	Per sample	128.00	
(xxi)	Calcium	Per sample	126.00	
(xxii)	Magnesium	Per sample	435.00	
(xxiii)	Chloride	Per sample	127.00	
(xxiv)	Coliform Faecal	Per sample	422.00	
(xxv)	Coliform Total	Per sample	532.00	
(xxvi)	Iron	Per sample	444.00	
219	Labour only for general reconnaissance survey of the total geographical area for tracing out the forest area, hillock and area suitable for detailed study. Study of strata of wells and also selection of representative wells of the area for ground water survey purposes only.	Sq km	0.2R	

Item No.	Item	Unit	Rate	Remarks
220	Labour only for systematic geological investigation for ground water survey purpose including carrying instrument at site breaking and collection of rock sample etc complete	Sq km	0.8R	
221	(a) Labour only for well inventory for regular observation well (O.W.) at regular interval in each season complete where distance between two O.W. is not more than 1 Km.	Per well	0.2R	
	(b) Labour only for well inventory of regular permanent observation well (P.O.W.) at regular interval, in each season complete, where distance between two P.O.W. is not less than 10 km.	Per well	2.0R	
222	Labour only for interference study of wells complete for ground water survey purpose only	Per job	4.0R	
223	Labour only for collection of water samples for chemical analysis for wells in area of 10 sq. Km. per day two Nos. samples.	Per sample	0.5R	
224	(a) Pumping test of well departmentally with 5 HP pump. Only for ground water draw down observation, including cost of P.O.L. i.e. diesel, M. Oil, Lubricants etc. and cost of labour and all material complete.			
	(i) For Departmental Use	Per hour	140.00	
	(ii) For semi Govt. & private Use:	Per hour	179.00	
	(b) Pumping test of well departmentally with 10 HP pump. Only for ground water draw down observation, including cost of P.O.L. i.e. diesel, M. Oil, Lubricants etc. and cost of labour and all material complete.			
	(i) For Departmental Use	Per hour	231.00	
	(ii) For semi Govt. & private Use:	Per hour	294.00	

CHAPTER 3 – JUNGLE CLEARANCE

Notes :-

1. Rates cover all costs of tools and plants required for clearance of jungle and felling of trees, including uprooting, stacking the cut and felled-material within a lead of 50 m.
2. Girth of trees shall be generally measured at one meter above the ground level unless otherwise specified.
3. In case of jungle clearance, felling and uprooting of trees, it is not possible to measure work after clearance and uprooting, unless initial records of jungle and trees to be felled are maintained. Therefore the area to be cleared and trees to be felled and uprooted should be marked at site in advance and recorded in measurement book by the Sectional Officer and checked by the S.D.O., before the work is commenced. Final measurements should be entered by the Sectional Officer and checked by the S.D.O.
4. Shrub jungle includes trees up to 20cm. girth.
5. No useful wood is expected to be available from shrub jungle clearance.
6. The wood obtained by the Department shall be auctioned after one notice, if it is not required by the department, alternatively it shall be handed over to the Forest or Revenue Department.
7. Where the jungle belongs to the Forest Department, it should generally be got cleared and disposed off by the Forest Department unless otherwise ordered by the Executive Engineer in writing for special reasons.
8. For survey and Investigation, the item 301 is not payable.
9. For items 205 to 207 of Chapter 2- "Survey and Investigation," the jungle clearance is not payable.
10. For Item 204 of Chapter 2 "Survey and Investigation" no separate payment for Jungle clearance is payable. However, when the alignments are passing through medium & thick jungle and its clearance is considered necessary by the Executive Engineer, the payment for jungle clearance can be made, depending upon the type of jungle involved, for width not exceeding 1.5m for alignments and 1 m for cross sections on specific prior written sanction of the Executive Engineer, which will include the type of jungle clearance to be done in different lengths and widths as considered necessary. For survey work, under item, 303 and 304 uprooting is not payable and accordingly payment be made as per item No. 309.
11. Separate payment for ordinary jungle clearance is not payable as extra item during survey.

Item No.	Item	Unit	Rate	Remarks
301	Site clearance of grass and crops including rooting out.	Per sqm	0.60	
302	Ordinary shrub jungle (area below 25% covered by shrubs) clearance involving removal of grass, shrubs and twigs, including rooting out.	Per sqm	1.10	
303	Medium shrub jungle clearance (25% to 50% area covered by shrubs) involving removal of grass, shrubs, bushes and twigs including rooting out.	Per sqm	0.10	For survey work the rate restricted as per note 10 and as per item No.309.
304	Thick shrub jungle clearance (area above 50% covered by shrubs) involving removal of grass, shrubs, bushes and twigs including rooting out.	Per sqm	0.20	For survey work the rate restricted as per note 10 and as per item No. 309
305	Cutting and felling of trees including uprooting of trees to the required depth (minimum depth one m) and cutting of trees into pieces and removing and stacking-			
	(a) Girth over 20 cm up to 60cm	Each	66.00	
	(b) Girth over 60 cm up to 90 cm	Each	131.00	
	(c) Girth over 90 cm up to 120 cm	Each	197.00	
	(d) Girth over 120 cm up to 150 cm	Each	394.00	
	(e) Girth over 150 cm up to 180 cm	Each	526.00	
306	Add for every additional increase of 30cm in girth beyond 180cm in item 305(e) above	Each	164.00	
307	Deduct from items 305(a) to 305(e) and 306 above for uprooting not done.	Each	50% of the items 305& 306	
308	Uprooting of roots of trees including removing and stacking (Girth to be measured at G.L.)	Each	50% of the items 305 & 306	
309	Deduct from items 302 to 304 for uprooting not done.	Sq.m	60% of the items 302 to 304	

CHAPTER 4-EXCAVATION AND EARTHWORK

Notes :-

1. Measurements- (A) Measurements of earthwork will be taken by cross sectional measurements. Only when such measurements are not possible, pit measurements may be taken, but full measurements will be checked by E.E.

In Case of cross sectional measurements the following deductions shall be made:-

	Percentage deduction to be made in completed sectional measurement	Percentage addition to designed height for shrinkage allowance
(a) Earth work rolled, watered and compacted at optimum moisture content to maximum dry density.		
(i) For embankment founded on unyielding (rock) foundations.	0.99	1.00
(ii) For embankment founded on compressible (soil) foundation	1.96	2.00
(b) Earthwork rolled and watered (light rolling, i.e. by non – powered rollers/hand ramming).	10.00	11.00
(c) Earth work rolled and not watered (light rolling i.e. by non – powered rollers/hand ramming).	15.00	18.00
(d) Earthwork neither rolled nor watered.	20.00	25.00
(e) Earthwork neither rolled nor watered in case of clayey soils like Kankar soil or black cotton soil.	25.00	33.00

- (B) The above percentages shall be reduced to the following extent if measurements have been taken after –

(a) One rainy season has passed.	50%
(b) Two rainy seasons have passed.	30%
(c) More than two rainy seasons have passed.	12.5%

- (C) The length, breadth and depth (or height) shall be measured correct to the nearest cm. If the measurements are taken with level and staff, the levels shall be recorded correct to 5mm. The area shall be calculated in Sq.m. correct to two places of decimal and cubical contents in cum correct to two places of decimal.
- (D) In case, measurements of rock in pit excavation are not possible, the measurements shall be taken as stack measurements. The excavated material shall be stacked properly and separate payment for stacking is not admissible. Deduction shall be made for voids at the rate of 40% of the volume of stack measurements to reduce them to pit measurements.

For accounting the excavated hard rock (inclusive of 40% voids), giving due consideration to unavoidable wastage, the quantity of utilisable rock to be recorded in books shall be 1.30 times (inclusive of 16% voids) the quantity paid in excavation (solid

rock cut). No further reduction for wastage is permissible. The finished item should be matched with the above quantity.

For Example:-

Hard rock-cut (solid volume) from excavation	1.00 cum
Corresponding stack volume with 40% voids	1.67 cum
Quantity of utilisable rock (for rubble, pitching stones etc.) to be Recorded in books with 16% voids	1.30 cum
Same if converted into metal including 8% voids	1.20 cum

Effort required for excavation shall be the criteria for classification of strata and power for classification of strata during excavation shall remain with Executive Engineer wherever, material to be received from. Hard rock excavation is not likely to be useful for breaking metal for Civil engineering works, verification of Chief Engineer/ Superintending Engineer before payment will be necessary.

2 Classification of Strata :-

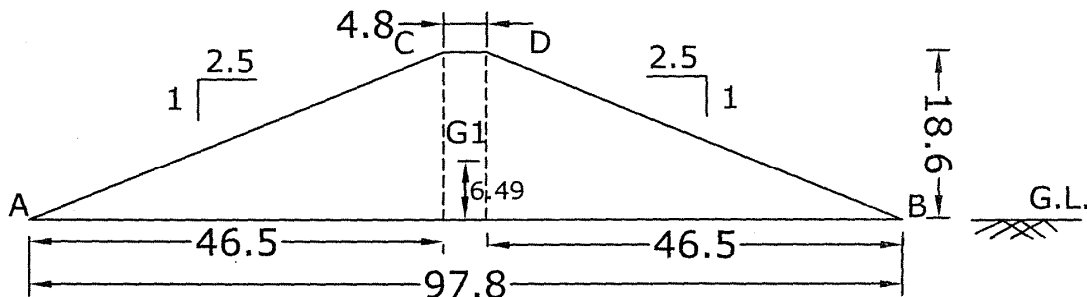
- (a) Soft or ordinary soil – Generally any soil which yields to the ordinary application of pick and shovel, or to spade, rake or other digging implement, such as vegetable or organic soil, turf , gravel, sand, silt, loam, clay, peat, etc.
- (b) Hard Soil : - Includes all materials which can be removed with shovel or spade after loosening with pick axe, such as clay, soil mixed with lime kankar, black cotton soil for earthen bound, soft moorum etc.
- (c) Hard moorum and moorum mixed with boulders :- Generally any material which requires the close application of picks, jumpers or scarifiers to loosen, such as hard and compact moorum and soft shale. Moorum or soil mixed with small boulder not exceeding 25% in quantity and each less than 0.014 cum (300mm dia or 1/70 cum) but more than 0.004 cum in size.

“Boulder is a rock fragment usually rounded by weathering, disintegration or exfoliation or abrasion by water or by ice found lying loose on the surface or embedded in river bed, soil, talus, slope wash, and terrace material of dissimilar origin.”
- (d) Disintegrated Rock :- Includes such strata’s which require the close application of crow bars, picks, grafting tools and scarifiers in suitable combination for its excavation such as soft laterite, soft conglomerate, hard shale, soft copra, hard and compacted moorum mixed with small boulders exceeding 25% in quantity but each not exceeding 0.014 cum in size.
- (e) Soft Rock :- Comprises of the following :-
 - (i) Boulders (dia more than 300mm but not greater than 0.50 cum in volume), hard laterite, hard copra and hard conglomerate or other rock which may be quarried or split with crow bars, with casual blasting , if required, for loosening of strata.
 - (ii) Any rock which in dry state may be hard, requiring blasting, but when wet becomes soft and manageable by means other than blasting.
- (f) Hard rock (requiring blasting) : - Any rock or boulder (more than 0.5 cum in volume) which requires use of mechanical plant or blasting for excavation or splitting.

- (g) Hard rock (Blasting prohibited) :- Hard rock requiring blasting as described under (f) but where blasting is prohibited for any reason and excavation has to be carried out by chiseling , wedging or any other agreed method.
3. Authority for classification: - The classification shall be decided by the Executive Engineer and his decision shall be final.
 4. Dressing: - (a) Dressing is normally required at one place i.e. at the place of excavation or at the place of filling, hence the rates provided in the schedule include dressing only once, either at the place of cut or at the place of fill. In case of canal excavation, where earth is reused at or near the same place and for the same work, in such case only one dressing which is already included in the basic rates is admissible, even though the dressing is actually needed at both the places i.e. at the place of cut and at the place of fill, while additional rate for trimming in cutting only will be payable.
 - (b) In case, dressing is not done either in cut or in fill or both, full rate for dressing will be reduced.
 - (c) No separate payment for dressing or trimming of spoil bank (s) and borrow area(s) shall be made.
 5. Trimming: - (a) This comprises of removing grass and grass roots, touching the uneven surface to a uniform surface (either horizontal or slopping), by scrapping off high patches and filling in low patches with the scraped soil. The maximum depth of cutting or filling not exceeding 15cm.
 - (b) This item of work shall however, not be payable for roadwork, maintenance of approach roads, service roads, etc. as well as where payment for dressing in earth work/excavation has already been made.
 6. Wet excavation: - Extra rate for excavation will be payable only for excavation below sub-soil water level. Trial pits shall be dug in the area where excavation is required to be done. The steady water level in the trial pits which is left undisturbed for 48 hours before the pumping operations are started, shall be considered as sub-soil water level in the area.
 7. Rates for items 401 to 409 include 50-m. free lead and 1.5m. free lift.
 8. Lifts: - by head load is payable only up to 100m. lead for earthen bunds and for earth work in canals in filling where dam specifications are to be followed.
 - (a) Lift for all modes of handling has to be measured in a upward direction, i.e. when the materials are moved against the force or gravity.
 - (b) All lifts shall be calculated on the basis of designed sections for earthen dam embankment i.e. it would be excluding shrinkage allowance.
 - (c) Lift will be calculated on the height of the centre of gravity of the lifted material above the average of stripped / benched levels of the dam / embankment. The average benched / stripped level shall be the average of all levels at every 5m or shorter interval along the cross section in the bottom width grid of the embankment which received the earthwork or shorter interval.
 - (d) For working out extra lift payable, the initial 1.5-m free lift shall be deducted.

- (e) In the case of earthwork for canals in partial or full cutting, lift will be calculated on the completed section of the work done from the centre of gravity of the cutting portion to the centre of gravity of embankment minus the 1.5 m. free lift.
- (f) In the case of canal excavation, where spoil bank is formed in number of sections, More than one, the quantity in each spoil bank has to be fitted into the canal excavation. The lifts payable will be for the centre of gravity of excavated portion to the centre of gravity of the corresponding spoil bank minus the 1.5 m free lift.
- (g) No negative (downward) lift shall be payable for earthwork excavation.
- (h) The estimate for earthen dams embankment be sanctioned on the basis of approved designs considering utilisation of useful available materials from excavation of approach/spill channel(s) . The estimate for approach/spill channel(s) be sanctioned only for the balance excavation which cannot be utilised. The payment shall also be made accordingly. For the entire excavated materials of approach / spill channel(s) , lift is payable from the centre of gravity of the excavated portions to the centre of gravity of the banks and deduction of 1.5m free lift shall be made to work out the extra lift payable
- (i) If the earthwork in dam embankment is done by more than one agency, then the centre of gravity of the overall section has to be calculated and the extra lift worked out as per method given in (c) above. For the payment of extra lift for the subsequent agency, the previous quantity and the amount of payment for extra lift shall be deducted. In no case, the payment for extra lift to the different agencies shall exceed the payment as if the entire work was done by one agency.
- (j) The methods of determining the total lift involved and the extra lift payable, for five different cases, considering one m. length of section, is given below :-

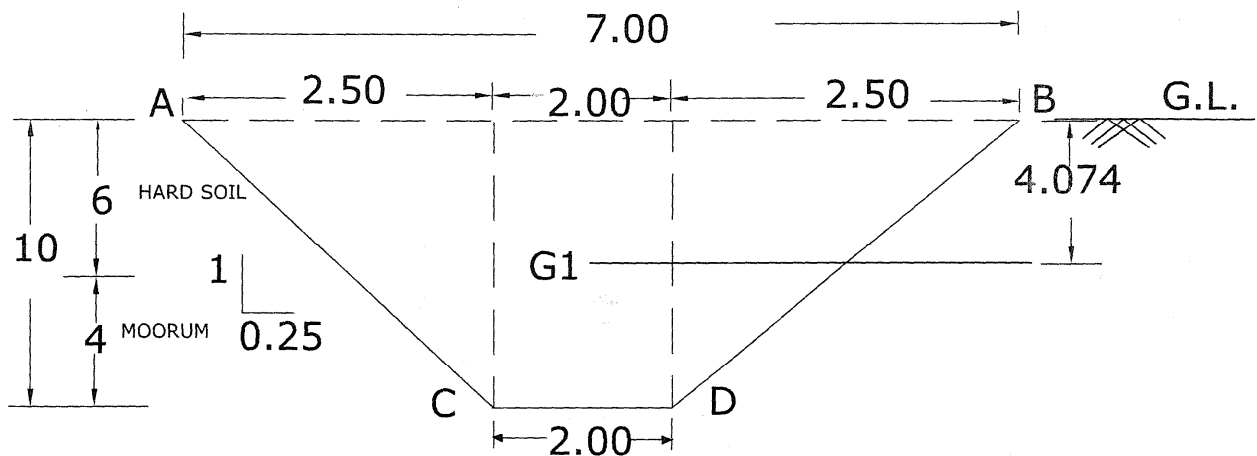
I. Embankment Section-



**NOT TO SCALE
ALL DIMENSIONS IN METER**

Quantity of earthwork for Which extra lift is payable (Section ABDC)	=	$1 \times (97.8 + 4.8) / 2 \times 18.6$
	=	954.18 cum.
C.G. of Section	=	$(2 \times 46.5 \times 18.6 / 2 \times 18.6 / 3 + 4.8 \times 18.6 \times 18.6 / 2) / (97.8 + 4.8) / 2 \times 18.6$
	=	6.49 m above G.L.
Extra lift payable	=	$6.49 - 1.50 = 4.99$ m i.e. 17 lifts of 0.3m. each for 954.18 cum earthwork

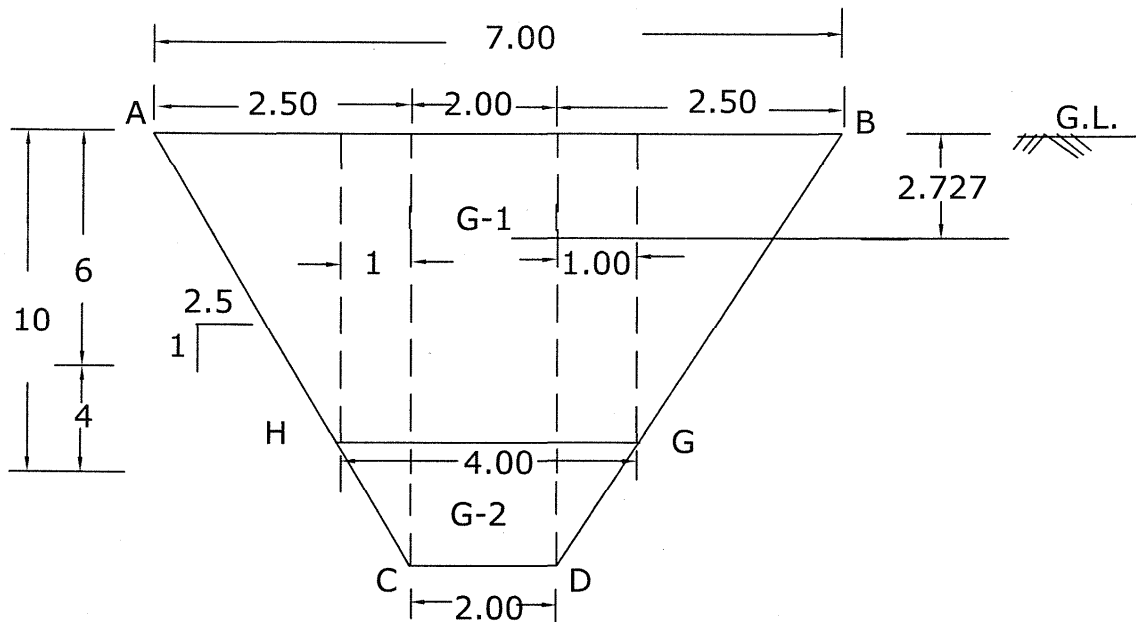
II. Cutting Section (Soil or rock cut)



**NOT TO SCALE
ALL DIMENSIONS IN METER**

Quantity of earthwork for Which extra lift is payable (Section ABDC).	=	$1 \times (7+2) / 2 \times 10 = 45$ Cum.
C.G. of Section ABDC(G-1)	=	$\{(2 \times 2.5 \times 10 / 2 \times 10 / 3) + (2 \times 10 \times 10 / 2)\} / \{(7+2) / 2 \times 10\}$ =4.074 m below G.L.
Extra lift payable	=	$4.074 - 1.50 = 2.574$ m i.e. 9 lifts of 0.3m each for 45 cum

III. Cutting Section (Soil and rock cut)



**NOT TO SCALE
ALL DIMENSIONS IN METER**

(1) For hard soil / moorum = $1 \times (7.0 + 4.0) / 2 \times 6.0 = 33 \text{ cum.}$

Strata i.e. first 6.0 m depth

Quantity on earth work for

Which extra lift is payable

(Section ABGH) –

C.G. of section ABGH (G - 1) = $(2 \times 1.5 \times 6 / 2 \times 6 / 3 + 4 \times 6 \times 6 / 2) / ((7+4) / 2 \times 6)$

= 2.727 m below G.L.

Extra lift payable

= $2.727 - 1.50 = 1.227 \text{ m. i.e. 5 lifts of 0.3 m each for 33.00 cum}$

(ii) For soft rock cut strata i.e form 6.0 m to 10.0 m depth.

Quantity of rock cut for which = $1 \times (4.0 + 2.0) / 2 \times 4$

Extra lift is payable (section

HGDC)

= 12.00 Cum.

C.G. of Section HGDC (G-2) = $(2 \times 1 \times 4 / 2 \times 4 / 3 + 2 \times 4 \times 4 / 2) / ((4 + 2) / 2 \times 4)$

= 1.778 m

Extra lift payable

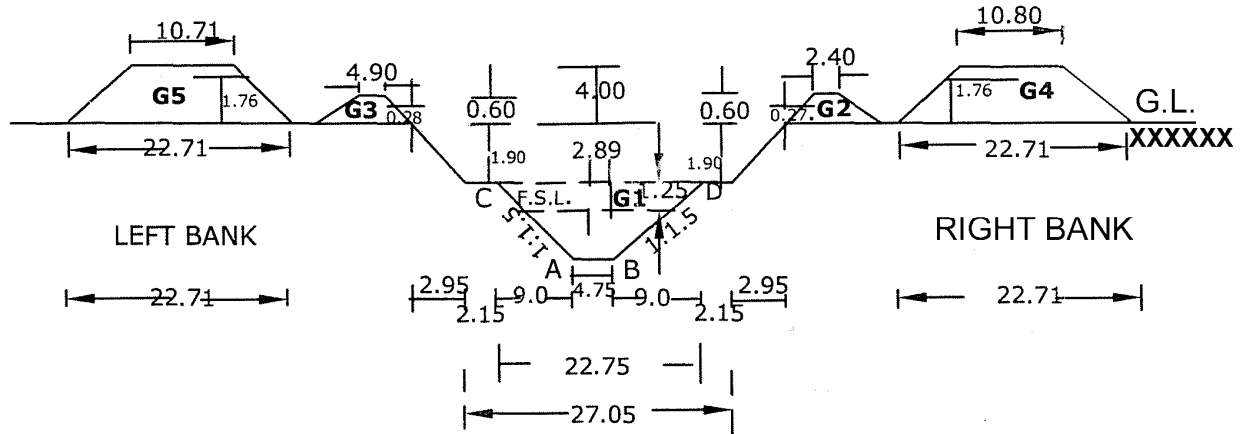
= $6.0 + 1.778 - 1.5$

6.278 m Say 6.28m i.e. 21 lifts of 0.3 m each for

12.0 Cum quantity.

IV Canal section – Partial cut and fill –

Note: Quantity of cutting is more than quantity of filling required.



**NOT TO SCALE
ALL DIMENSIONS IN METER**

Quantity of cutting section	$= 1 \times (4.75 + 22.75) / 2 \times 6.0$
ABDC	$= 82.50 \text{ cum}$
Section FEDC	$= 1 \times (27.05 + 32.95) / 2 \times 1.90$
	$= 57.0 \text{ cum}$
Total quantity in cutting	$= 82.50 + 57.0 = 139.50 \text{ cum.}$
Quantity for right bank.	$= 1 \times (2.4 + 4.2) / 2 \times 0.60$
	$= 1.98 \text{ cum} \quad (1)$
Quantity for left bank	$= 1 \times (4.9 + 6.7) / 2 \times 0.60$
	$= 3.48 \text{ cum} \quad (2)$
Quantity for right spoil bank	$= 1 \times (10.80 + 22.80) / 2 \times 4$
	$= 67.20 \text{ cum} \quad (3)$
Quantity for left spoil bank	$= 1 \times (10.71 + 22.71) / 2 \times 4$
	$= 66.84 \text{ cum} \quad (4)$
Total quantity check	$= 1.98 + 3.48 + 67.20 + 66.84 = 139.50 \text{ cum}$
C.G. of cutting of section	$= [(2 \times (9 \times 6) / 2 \times (6/3 + 1.9) + 4.75 \times$
FEDBAC	$6 \times (6 + 1.9) / 2 + 2 \times (2.95 \times 1.9) / 2 \times 1.9 / 3 +$
(G-1)	$27.05 \times 1.9 \times 1.9 / 2] / ((2 \times 9 \times 6) / 2 + (4.75 \times 6) + (2 \times 2.95 \times 1.9) / 2 + (27.05 \times 1.9))$
	$= 2.886 \text{ m Say } 2.89 \text{ m.}$
C.G. of right bank (G-2)	$= (2 \times (0.9 \times 0.6) / 2 \times (0.6 / 3) + 2.4 \times 0.6 \times$
	$(0.6) / 2) / ((4.2 + 2.4) / 2 \times 0.6)$
	$= 0.273 \text{ m Say } 0.27 \text{ m.}$
C.G. of left bank (G-3)	$= (2 \times (0.9 \times 0.6) / 2 \times (0.6 / 3) + (4.9 \times 0.6 \times$
	$0.6 / 2) / (4.9 + 6.7) / 2 \times 0.6$
	$= 0.284 \text{ m Say } 0.28 \text{ m.}$
C.G. of right spoil bank (G-4)	$= (2 \times (4 \times 6) / 2 \times 4 / 3 + 10.8 \times 4 \times 4 / 2) / ((22.80$
	$+ 10.80) / 2 \times 4.$
	$= 1.762 \text{ m Say } 1.76 \text{ m.}$

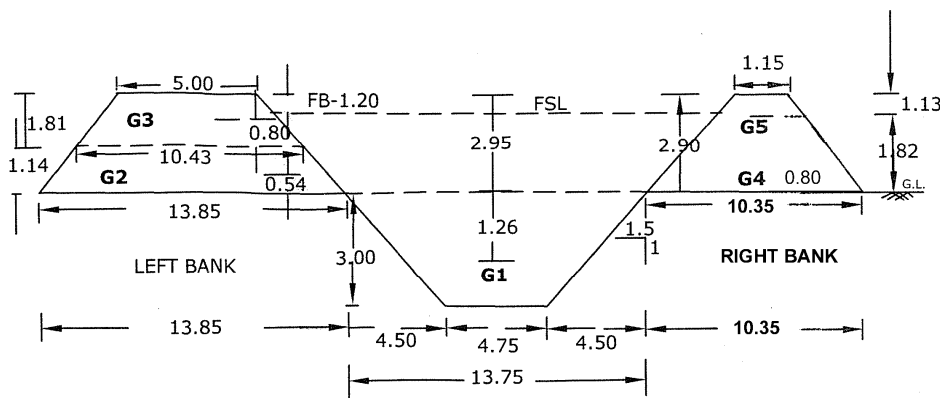
C.G. of left spoil bank (G-5)

$$= (2 \times (4 \times 6) / 2 \times 4/3 + 10.71 \times 4 \times 4 / 2) / ((22.71 + 10.71) / 2 \times 4) = 1.760 \text{ m Say } 1.76 \text{ m.}$$

	Right bank	Left bank	Right spoil bank	Left spoil bank
Quantity of earth for which extra lift is payable (in cum).	1.98	3.48	67.20	66.84
Distance between C.G. of bank & the C.G. of cutting in m.	2.89 + 0.27	2.89 + 0.28	2.89 + 1.76	2.89 + 1.76
Extra payable lift beyond the Initial lift of 1.5 m.	3.16	3.17	4.65	4.65
Number of extra lifts 0.3 m. each payable	1.66	1.67	3.15	3.15
	6	6	11	11

V. Canal Section – Partial cut and fills

Note – Quantity of cutting is less than the quantity of filling required.



**NOT TO SCALE
ALL DIMENSIONS IN METER**

Quantity of cutting

$$= 1 \times (4.75 + 13.75) / 2 \times 3 = 27.75 \text{ cum}$$

Centre of gravity of cutting

$$= (2 \times (3 + 4.5) / 2 \times 3/3 + (4.75 / 2 \times 3 \times 3) /$$

G – 1

$$((13.75 + 4.75) \times 3 / 2)$$

$$= 1.26 \text{ m below G.L.}$$

A. Calculations for formation of Banks – Left Bank is to be 2.95 m high with top width as 5 m & side slopes as 1 in 1.5, hence the bottom width be 13.85 m. the height of this bank which could be formed from half of the quantity of cutting would be, X, which is solved mathematically.

$$27.75/2 = ((13.85 - 1.5 \times 2 X) + 13.85) \times X / 2)$$

$$\text{or } X = \frac{27.70 \pm \sqrt{(27.70^2 - 4 \times 3 \times 27.75)}}{2 \times 3}$$

$$X = 1.143 \text{ m say } 1.14 \text{ m}$$

$$= \frac{27.70 \pm \sqrt{(27.70^2 - 4 \times 3 \times 27.75)}}{2 \times 3}$$

The balance height of $2.95 - 1.14 = 1.81$ m shall be formed with earth borrowed. No extra lift would be payable for forming the bank from the height above. 1.14 m up to 1.5 m being included in the initial lift of excavation.

The right bank which has to be of 2.95 m height, top width of 1.5 m, side slopes of 1 In 1.5, the bottom width would be 10.35 m, and the height to which this bank with half the quantity of cutting could be formed would be y, which is solved mathematically.

$$27.75/2 = ((10.35 - 2.0 \times 0.5 \times y + 10.35) \times Y / 2)$$

$$\text{or } y = \frac{20.70 \pm \sqrt{(20.70)^2 - 4 \times 3 \times 27.75}}{2 \times 3}$$

$$Y = 1.82 \text{ m}$$

Hence, the balance height of $2.95 - 1.82$ borrowed.

1.13 m shall be formed with earth

B. Earthwork quantity for left bank.

1. (a) From G. L. up to 1.14m

$$= 1 \times (13.85 + 10.43) / 2 \times 1.14 = 13.84 \text{ cum}$$

(b) From 1.14 m up to 2.95 m

$$= 1 \times (5.0 + 10.43) / 2 \times (2.95 - 1.14) = 13.96 \text{ cum}$$

Check total quantity for left bank.

$$= 13.84 + 13.96 = 27.80 \text{ cum}$$

$$\text{or } = 1 \times (5 + 13.85) / 2 \times 2.95 = 27.80 \text{ cum}$$

C. Earth work quantity for right bank –

1. (a) From G. L. up to 1.82 m height

$$= 1 \times (10.35 + 4.89) / 2 \times 1.82 = 13.87 \text{ cum}$$

(b) From 1.82 m up to 2.95 m height

$$= 1 \times (4.89 + 1.5) / 2 \times (2.95 - 1.82) = 3.61 \text{ cum}$$

Check total quantity for right bank.

$$= 13.84 + 3.61 = 17.478 \text{ cum say } 17.48$$

$$\text{or } = 1 \times (1.5 + 10.35) / 2 \times 2.95 = 17.48 \text{ cum}$$

D. Center of gravity calculations –

1. Left Bank -

(a) From G. L. up to 1.14 m height (G -2)

$$= (2 \times (1.71 \times 1.14) / 2 \times 1.14 / 3) + (10.43 \times 1.14 \times 1.14) / 2 / ((13.85 + 10.43) / 2 \times 1.14) = 0.54 \text{ m}$$

(b) From 1.14 m up to 2.95 m (G - 3)

$$= (2 \times (2.72 \times 1.81) / 2 \times (1.81 + 5) / 3 \times 1.81 \times 1.81 / 2) / ((5 + 10.43) / 2 \times 1.81) = 0.80 \text{ above } 1.14 \text{ m.}$$

2. Right Bank

(a) From G. L. up to 1.82 m height (G-5)

$$= (2 \times (2.73 \times 1.82) / 2 \times 1.82 / 3) + (4.89 \times 1.82 \times 1.82) / 2 / ((10.35 + 4.89) / 2 \times 1.82) = 0.80 \text{ m}$$

(b) From 1.82 m up to 2.95 m (G-6)

$$= (2 \times (1.7 \times 1.13) / 2 \times (1.13 / 3) + 1.5 \times 1.13 \times 1.13 / 2) / (4.89 + 1.15) / 2 \times 1.13 = 0.465 \text{ or say } 0.47 \text{ m above } 1.82 \text{ m.}$$

S. No	Item	Left Bank From Cutting	From Borrow	Right Bank From Cutting	From Borrow
(i)	Earth Work Quantity for payment of extra lift (in cum)	13.84	13.96	13.87	3.61
(ii)	C.G. in m. from cutting	1.26	1.14	1.26	1.82
	From filling	0.54	0.80	0.80	0.47
	Total	1.80	1.94	2.06	2.20
(iii)	Number of extra lifts Payable 0.3 m each.	1	2	2	2

- (i) Lift is not admissible when the total distance exceeds 100m.
- (9) Lead – (a) Extra lead for earthwork by head load beyond initial 50 m free lead will be payable for every additional 25m or part thereof up to a total distance of 100 m. The extra lead charges for earth work by head load beyond 50m. Free lead will be payable as per item 2903 of chapter 29 (Transportation of materials)
- (b) In canal excavation the earth excavated from surplus reaches should be utilised in adjoining deficit reaches so that the land acquisition for disposal of surplus earth and borrow areas in deficit reaches is reduced to a minimum. Accordingly the surplus earth should be shifted to deficit reaches up to a total distance of 200m such that the surplus earth from excavation of items 401 and 402 is utilised in the nearest reach first. For this purpose on the basis of starting levels a shifting statement should be prepared which will form the basis for shifting of earth and computation of net payable quantity of earthwork and lead charges.
- When there are no deficit where the surplus earth can be shifted, the surplus earth shall be disposed in a planned manner with due regard to drainage arrangement.
- (c) The lead for earthwork shall be measured from the centre of borrow area (s) to the centre line of the dam/embankment and shall be measured as crow flies, the crawly distance being measured from the geometrical centre of borrow area(s) to the centre of the dam/embankment . While calculating the lead for payment an additional five percent over the distance calculated above shall be added to cover circuitous path.
- (10) Bailing out water :- (a) Rates do not include any allowance for bailing out of water.
- (b) For excavation done departmentally the bailing out of water, not requiring pumping shall be done as a separate item, as per actual expenses. The decision of the Executive Engineer, as to whether or not pumping is necessary for bailing out water in any particular case, shall be deemed as final.
- (11) Rates of items 401 to 409 include the following :-

- (a) Separation of serviceable and unserviceable material and depositing them separately in regular heaps or stacks as directed. Where stacking of material is done under Specific orders of the Executive Engineer with a view to utilities the entire materials on other items of works, separate rate for stacking shall be payable.
- (b) Forming (or leaving) 'dead men' or 'tell-tales' in borrow pits and their removal after measurements.
- (c) Removing slips or falls in excavations.
- (d) Forming (or leaving) steps in sides of deep excavation and their removal after measurements.
- (e) Precautionary measures to be adopted in blasting as per I.S. 4081-1967 "Safety code of blasting" (as amended from time to time) and storing explosives as per "Explosives Rules 1940" corrected up to date.
- (12) Antiquities :- Any ancient carvings, relics of antiquity, coins or other curiosities which may be discovered or excavated are the property of Government and are to be delivered to the Engineer-in-Charge.
- (13) Any vegetation, earth, moorum, sand, gravel, stone, debris, bricks, brickwork, concrete, masonry etc. obtained from excavation shall from the property of the Government.
- (14) Silt Clearance :- (a) In irrigation channels no silt clearance may be necessary unless the slit is so much that the full supply discharge has encroached half or more of the free board provided. If this condition is satisfied and it is considered necessary to do the slit clearance, then the work may be taken up only after obtaining prior sanction to the estimate, prepared on the basis of L-Section, cross-sections at every 150m or less plotted on graph, duly compared with the completion sections, by the competent authority. In the report of the estimate, the reasons necessitating silt clearance, the date when this was done last in the said reach, with quantity may also be stated invariably. It would be necessary for the Chief Engineer/Superintending Engineer to certify that silt clearance is absolutely required.
- (b) The estimate for removal of silt should be sanctioned separately and charged under maintenance head and not to the original work.
- (c) The sanctioning authority should also endorse to the Chief Technical Examiner, a copy of the forwarding memo, while communicating sanction to the estimate to their subordinate formations, along with a copy of the sanctioned estimate.
- (d) For silt clearance work tenders must be invariably invited. In case, if reasonable rates are not received even after second call, the work may be taken up on piecework as per rules.
- (e) When silt clearance is done all procedures required such as starting levels, final levels and recording measurement in M.B. and prescribed checking should be exercised.
- (f) The payment for silt clearance in channels shall be made as per item No. 408.

- (15) Removal of earth deposits from the bed of new channels :- Removal of the earth/soil deposited, including due to slips etc., in the bed of channel could be paid as per item No. 401, only when the estimate for its removal has been prepared on the basis of cross sections, longitudinal section plotted on graph measurement book(s), duly compared with the completed/executed/designed section and later sanctioned by the competent Authority . Such work could then be executed through contract "Agency on form A or form B".
- (16) Benching: - Benching should be provide only where the works are to be done on highly undulating & stiff ground / steeply sloping ground.
- Note: (1) Where F.S.L. of the channel is below the ground level neither stripping nor ploughing and furrowing shall be done.
- (2) Neither stripping nor benching shall be done for seat under spoil banks.
- (3) Where the depth of stripping needed is more than 15cm. It shall be carried out only after approval by the Superintending Engineer.

Item No.	Item	Unit	Rate	Remarks
401	(a) Excavation in soft or ordinary soil including 50m lead and 1.5m lift with dressing.	cum	61.00	
	(b) Excavation in hard soil including 50m lead and 1.5m lift with dressing.	cum	72.00	
402	Excavation in hard moorum and moorum with boulders including 50m lead and 1.5m lift with dressing.	cum	85.00	
403	Excavation in disintegrated rock including 50m lead and 1.5m lift with dressing	cum	169.00	
404	Excavation in soft rock including 50m lead and 1.5m lift with dressing.	cum	300.00	
405	Excavation in hard rock including 50m lead and 1.5 m lift			
	(a) Blasting permitted	cum	489.00	
	(b) Blasting prohibited	cum	733.00	
	(c) Controlled blasting permitted as per design	cum	636.00	
406	Removal for hard rock, by chiseling and chipping etc. not exceeding 150mm for foundation of dams and canal structures etc. include 50m lead and 1.5m lift.	Sq.m.	128.00	Not to be done without written permission of E.E.
407	(a) Excavation in spoil banks formed with excavated materials, item 401(a), including 50m lead and 1.50m lift with dressing-			

Item No.	Item	Unit	Rate	Remarks
	(i) when no rainy season has passed	cum	30.00	
	(ii) When one rainy season has passed	cum	37.00	
	(iii) When two rainy seasons have passed	cum	49.00	
	(iv) When more than two rainy seasons have passed.	cum	55.00	
	(b) Excavation in spoil banks formed with excavated materials, item 401(b) and 402, including 50m lead and 1.5m lift with dressing -			
	(i) When no rainy season has passed	cum	39.00	
	(ii) When one rainy season has passed	cum	51.00	
	(iii) When two rainy seasons have passed	cum	63.00	
	(iv) When more than two rainy seasons have passed.	cum	71.00	
408	Dry silt clearance in channels including 50 m lead and 1.5m lift with dressing.	cum	65.00	
409	Dry silt clearance including 50m lead and 1.5m lift with dressing from drainage culvert or syphons with height of openings			
	(a) 2m and above	cum	71.00	
	(b) Below 2m	cum	78.00	
410	Extra rate for excavation of foundation where designed depth is more than 1.5 times the specified top width (for items 401 to 406).	cum	10% above	
411	(a) Extra rate for wet excavation below sub soil water level (for items 401, 402,408 and 409).	cum	30% above	
	(b) Extra rate for wet excavation below sub soil water level (for items 403 to 406)	cum	8% above	
412	Extra rate beyond initial 1.5m lift for every additional lift-of 0.3 m or part thereof (for items 401,402,407 to 409 and 415).	cum	4.00	

Item No.	Item	Unit	Rate	Remarks
413	Extra rate beyond initial 1.5m lift for every additional lift of 0.3 m or part thereof (four items 403 to 406)	cum	6.00	
414	Trimming the uneven surface to uniform surface.	Sqm	11.00	
415(A)	Earth work for bund and for canal banks needing dam specification in hearting or casing with approved soils, including dressing, breaking of clods, laying in layers of maximum 15cm thickness, cutting and finishing U/S & D/S slopes of bunds but excluding watering and compaction for :-			Item 415(A) is not payable for earth work on the bund for maintenance & repair but is applicable for
	(i) All lifts & 50m free lead	cum	99.00	
	(ii) All lift and lead beyond 50m upto 100m	cum	109.00	
415(B)	Filling of cut off trench with cohesive soils including dressing, breaking clods, laying in layers of 15cm thickness, including:-			
	(i) All lifts & leads beyond 100m up to 500 m or all materials and all other charges but excluding watering and compaction.	cum	85.00	
	(ii) All lifts & leads beyond 0.50 km up to 2 km of all materials & all other charges but excluding watering and compaction	cum	95.00	
416	Dressing of earth work in-			
	(a) Soft soil	cum	4.00	
	(b) Hard soil	cum	9.00	
	(c) Hard Moorum	cum	14.00	
	(d) Disintegrated rock	cum	21.00	
	(e) Soft rock	Cum	24.00	
417	(a) Compaction of earthwork at optimum moisture content to dry density not below 90% by light rollers i.e. non-powered rollers or sheep foot earth masters or hand rammers (excluding watering).	Cum	16.00	Not to be done on new bunds without written permission of S.E.

Item No.	Item	Unit	Rate	Remarks
	(b) Compaction of earthwork at optimum moisture content to maximum dry density (excluding watering) :-			
	(i) By D.R.R. or S.R.R. of 8 tonnes or more.	Cum	16.00	
	(ii) By S.F.R.	Cum	21.00	
	(iii) Vibrators/High speed rollers	Cum	13.00	
418	(a) Watering earthwork for compaction at optimum moisture content with lead of water up to 100 m.	Cum	23.00	Lead to be measured from the centre line of the bund.
	(b) Labour for watering only in item 418(a)	Cum	5.00	
419	Shoring in foundation for excavation of trenches in sandy soil or, slippery soil including all lead and lift for all materials and subsequent removal.			Not to be done without written permission of E.E.
	(a) depth not exceeding 1.5 m	Sq.m.	62.00	
	(b) depth exceeding 1.5m & up to 3 m	Sq.m.	64.00	
	(c) depth exceeding 3m & up to 4.5m	Sq.m.	68.00	
420	Extra rate for separation of boulders of size 0.004 cum (1/250 cum) and more from the earthwork vide item 402 including stacking.	Cum	26.00	
421	(a) Boring holes with auger for under reamed pile to a depth of 3.5 m in any soil below sub-soil water level, if any, including reaming 2.5 times the dia of piles (one bulb only)-			
	(i) For 200 mm dia piles	Each	304.00	
	(ii) For 250 mm dia piles	Each	351.00	
	(iii) For 300 mm dia piles	Each	377.00	
	(b) Add to or deduct from the rate for bore holes of 3.5m depth if the bore holes are deeper or shallower-			
	(i) For 200 m dia piles	m	70.00	
	(ii) For 250 mm dia piles	m	90.00	
	(iii) For 300 mm dia piles	m	106.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Add for additional excavation of bulb for double under reaming			
	(i) For 200mm dia piles	Each	73.00	
	(ii) For 250 mm dia piles	Each	96.00	
	(iii) For 300 mm dia piles	Each	113.00	
422	Pumping out water caused by springs tidal or river seepage, broken water main or drains and like	K.Lit	36.00	

CHAPTER 5 – COLLECTION OF MATERIALS

Notes :-

1. The rate is for collection of materials at Quarry.
2. The payment for collection will be made for delivery of materials at specified sites. The payment for collection of materials at quarry or source shall not be made without the written permission of the Chief Engineer/Superintending Engineer.
3. The rates include –
 - (a) All lead and lift involved for collection purpose at quarry.
 - (b) Screening to remove dust, etc.
 - (c) Removal of unsuitable material or weathered stuff.
 - (d) Royalty VAT & other charges as fixed by CG Govt.
 - (e) Stacking and Boxing.
 - (f) Opening of quarry and removal of over burden.
 - (g) Making of approach road to quarry area. No separate payment for this item is to be paid to contractor.
4. Though separate rate for stocking, boxing, screening, washing etc. have been specified in respect of this chapter, however in principle all the rates for collection of different materials given in this chapter are inclusive of stacking, boxing, screening, washing etc.
5. Measurements – (a) The following deductions will be made from stack measurements.

(i) Metal, Kankar, gravel, shingle, stone chips and quarry spalls	8%
(ii) Moorum, sand, boulders, masonry stones, pitching stones and rubble.	16%
(iii) Puddle earth.	25%

 - (b) Metal, moorum and sand for use on roadwork will be boxed for measurement in boxes measuring 1.5m x 1.5m x 0.5m
 - (a) Boulders for use on roadwork will be stacked in regular stacks measuring 2.5m x 5m x 0.5m
 - (b) for other works if (b) and (c) cannot be followed the materials may be stacked in stacks with length and breadth in multiple of 1 m.
6. (a) Boulders mean stones of any type , which have been weathered and rounded off due to action of sun, wind and rain and which occur in natural condition, either on the surface of earth or burried below surface.
 - (a) Quarried stones mean stones of suitable sizes, which have been broken from much bigger boulders, stones or rock extracted from quarries. The criteria for this is that more than 50% of the surface of each stone should be broken surface.
7. Blasting: - Blasting rate is payable for item 503 for collection from qurries of massive hard rock or compact lime stone, hard Sand stones or similar formations for the extraction of which blasting is actually done.

8. Size of metal should confirm to the grading as per table below :-

Single sized coarse aggregate of nominal size

Nominal size of aggregate in mm	Passing through mesh size in mm	Retained on square mesh size in mm
100	110	80
80	90	60
60	75	40
Single sized coarse aggregate of nominal size		
40	50	25
25	40	20
20	25	12
12	20	6
10	12	6
6	10	3.5

Item No.	Item	Unit	Rate	Remark
501	Collection of puddle earth	cum	64.00	
502	(a) Collection of soft moorum	cum	64.00	
	(b) Collection of hard moorum	cum	73.00	
503	Collection of hard metal (without blasting)-			
	(a) 100mm nominal size	cum	191.00	
	(b) 80 mm nominal size	cum	215.00	
	(c) 60 mm nominal size	cum	261.00	
	(d) 40 mm nominal size	cum	419.00	
	(e) 25 mm nominal size	cum	554.00	
	(f) 20 mm nominal size	cum	565.00	
	(g) 12 mm nominal size	cum	554.00	
	(h) 10 mm nominal size	cum	542.00	
	(i) 6 mm nominal size	cum	452.00	
504	Collection of shingle or gravel including screening :-			
	(a) 100 mm nominal size	cum	134.00	
	(b) 80 mm nominal size	cum	129.00	
	(c) 60 mm nominal size	cum	118.00	
	(d) 40 mm nominal size	cum	168.00	
	(e) 25 mm nominal size	cum	222.00	

Item No.	Item	Unit	Rate	Remark
	(f) 20 mm nominal size	cum	226.00	
	(g) 12 mm nominal size	cum	222.00	
	(h) 10 mm nominal size	cum	217.00	
505	Deduct from item 503 above for metal breaking with Govt. boulders and excavated rock.	cum	104.00	
506	Collection of boulders at source (maximum size 0.014 cum), without quarrying i.e. picked up boulder.	cum	93.00	
507	(a) Collection of quarried stones Maximum size 0.014 cum	cum	268.00	
	(b) Collection of quarried stones (size 0.014 cum to 0.06 cum)	cum	441.00	
508	Collection of stone chips, quarry spalls or rubble (maximum size 0.004 cum)-	cum	162.00	
509	Collection of size stones for coursed rubble masonry rectangular in shape (size 0.014 to 0.06 cum) including 20% headers -	cum	748.00	
510	Collection of rubble for masonry (size 0.014 to 0.06 cum) other than black trap, basalt or granite	cum	626.00	
511	Collection of face stones for dam masonry hammer dressed on face, with one line chisel dressed 75mm depth from face. On bed, top an sides and hammer dressed below 75 mm depth of the stone up to rear face. Beyond this depth of 75 mm the stones may taper, but the tail end of the stone shall be at the minimum length specified having at least half the area of the face, comprising of			
	(a) Stretcher – size 55x35x30cm	Each	156.00	
	(b) Header - size 60 to 45x30x30cm	Each	163.00	
	(c) Bond stone size 70 to 60x30x30cm	Each	170.00	
Note :-	10% of the face stones should be bond stones.			
512	Collection of pitching stones size 20 to 25 cm and not less than 0.021 cum (without dressing) -	cum	476.00	

Item No.	Item	Unit	Rate	Remark
513	Collection of pitching stone, size 28 to 32cm and not less than 0.024 cum (without dressing)-	cum	566.00	
514	Extra rate for blasting for item 503 -	cum	79.00	
515	Stacking and boxing			
	(a) Moorum or sand	cum	14.00	
	(b) Metal & Shingle or gravel	cum	23.00	
516	Stacking without boxing -			
	(a) Puddle earth, moorum, sand or Kankar	cum	7.00	
	(b) Metal, shingle, stone chips, or quarry spalls.	cum	12.00	
	(c) Masonry stones, pitching stones or boulders.	cum	23.00	
517	Screening -			
	(a) Metal shingle or gravel	cum	35.00	
	(b) Sand	cum	24.00	
518	Washing sand, metal, shingle or gravel.	cum	70.00	
519	Collection of boulder or rubble from excavated materials.	cum	46.00	For use on boulder toe, boulder soling etc.
520	Collection of through/bond stones	cum	2726.00	

CHAPTER 6 – MORTAR

Notes :-

1. Rates include lead up to 100 m for all materials for all items.
2. Rates include all lifts for all materials.
3. Sand shall conform to I.S 383-1970 for concrete, I.S. 2116-1980 for masonry mortar and I.S. 1542-1992 for plaster. (As per latest revision).
4. Bulking of sand – In the nominal mortar mixes specified by volume, sand is assumed to be dry. Dry and saturated sand has almost the same volume but damp sand increases in volume, depending upon moisture content. Due allowance for bulking of sand shall be made while preparing the mortar mixes, based on volume measurements, in accordance with I.S. 2386 (part-III) – 1963. (As per latest revision).
5. For measuring sand boxes of internal size 35 cm x 25 cm x 40 cm depth shall be used.
6. The following I.S. code shall be used.
 - I.S. 269-1989 – Ordinary Portland cement, 33 Grade (Fourth revision) (Reaffirmed 2004)
 - I.S. 455-1989 -Portland slag cement (third revision) (with Amendment Nos. 1to6) (Reaffirmed 2005)
 - I.S. 456-2000-Plain and reinforced concrete (third revision) (Reaffirmed 2005)
 - I.S. 457-1957-General construction on plain and reinforced concrete for dams and of the massive structures. (Reaffirmed 2005)
 - I.S. 460 (Pt. 1&II)- 1985 – Test sieves (third revision) (Reaffirmed 2004)
 - I.S. 1489-1991-Portland pozzolana cement (second revision)
 - I.S. 1514-1990-Methods of sampling and test for quick lime and hydrated lime (Reaffirmed 2003)
 - I.S. 1542-1992-Sand for plaster (first revision) (Reaffirmed 2003)
 - I.S. 1635-1992-Field slaking of building lime and preparation of putty (first revision) (Reaffirmed 2003)
 - I.S. 1727-1967-Methodes of test for pozzolanic materials (first revision) (Reaffirmed 2004)
 - I.S. 2116-1980-Sand for masonry mortars (first revision) (reaffirmed 2002)
 - I.S. 2250-1981-Perparation and use of masonry mortar (reaffirmed 2000)
 - I.S. 2386 (Pt. I to VIII)-1963-Methodes of testing for aggregates for concrete. (reaffirmed 2007)
 - I.S. 3466-1988-Masonry cement (second revision) (reaffirmed 2004)

I.S. 4082-1996-Stacking and storage of construction material at site (first revision)
(reaffirmed 2003)

I.S. 6932(Pt.II)-1984-methodes of test for building limes (reaffirmed 2000)

I.S. 8041-1990-Rapid hardening Portland cement (reaffirmed 2004)

I.S. 9103-1999-Admixtures for concrete) (reaffirmed 2004)

Item No.	Item	Unit	Rate	Remarks
601	Cement mortar 1:2	cum	4036.00	
602	Cement mortar 1:3	cum	2763.00	
603	Cement mortar 1:4	cum	2164.00	
604	Cement mortar 1:5	cum	1790.00	
605	Cement mortar 1:6	cum	1491.00	
606	Cement mortar 1:8	cum	1191.00	
607	Labour only for item 603 to 606 for mixing cement mortar	cum	147.00	
608	Cost of water only in Items 601 to 606	One cum of mortar	36.00	
609	White cement mortar 1:3	Cum	8278.00	
610	White cement mortar 1:2	cum	11307.00	

CHAPTER 7 – FILLING FOUNDATIONS

Notes :-

1. Rates Include –
 - (a) Lead up to 100m for all materials for all item, if not specified otherwise.
 - (b) Cost of all materials including water.
 - (c) All lifts for all items unless otherwise specified.
 - (d) All finishing.
 - (e) Cost of curing.

2. Rate do not include centering ,shuttering and formwork .
3. Rates are also applicable for filling under floors.
 - (a) Rates are for metals.
 - (b) Blasting charges for metal are payable as per item 514 for the quantity required vide Appendix-I.

4. (a) The proportion of materials for nominal mix shall be used as given in table 13 of specification Vol-I para 7.5.2.4.1 of page 7-32. It should be on the basis of weight of cement & aggregates Nominal mix proportion by volume under special circumstances only may be permitted by the Chief Engineer/Superintending Engineer in-charge under written orders before commencing the work. A rough guide for the nominal mix proportion by volume will be 1:4:8, 1:3:6, 1:2:4, 1:1.5:3, 1:1:2, for , M-7.5, M-10, M-15, M-20, & M-25 concrete respectively.
- (b) For cement , which normally comes in bag and used by weight volume shall be worked out taking 50 kg. of cement as 0.035 cum. In volume. The quantity of water per 50 kg. (0.035 cum.) of cement shall be as specified in table-13 of specification.

5. The proportioning of sand shall be done on the basis of its dry volume and in case of damp sand allowance for bulmage shall be made as given in note 4 of chapter 6-“MORTARS”

6. Measurements:- (i) Dimensions shall be measured correct to the nearest cm. The area shall be calculated in Sq.m. correct to two places of decimal and cubical contents in cum correct to two places of decimal.
- (ii) No deduction shall be made for the following:-
 - (a) Ends of dissimilar materials for example, beams, posts, girders, rafters, purlins, trusses, corbels and steps up to 0.5 Sq. m. in cross-section.
 - (b) Opening up to 0.1 Sq.m. in area (in calculating area of an opening, the thickness of any separate lintel or sill shall be included in height. No extra labour for forming such openings or voids shall be measured).
 - (c) Volume occupied by pipes, conduits, sheathing, etc. not exceeding 0.1 Sq.m. each in cross-sectional area and;

(d) Moulds, drip mouldings, chamfers, splays rounded or coved angles, beds, grooves and rebates up to 10cm. In width or 15 cm in girth.

7. For plum concrete the plum used shall be of 150-mm maximum size rubble or boulders.
8. The proportioning of single size aggregate for various cement concrete mixes shall be as per table given below :-

Cement Concrete Mix	Maximum size aggregate specified	Parts of aggregate of single size				
		60 mm	40 mm	20 mm	12.5 mm	10 mm
C.C.1:4:8	63 mm	6	-	2	-	-
C.C.1:4:8	40 mm	-	6	2	-	-
C.C.1:4:8	20 mm	-	-	6	-	2
C.C.1:3:6	63 mm	4.5	-	1.5	-	-
C.C.1:3:6	40 mm	-	4.5	1.5	-	-
C.C.1:3:6	20 mm	-	-	4.5	-	1.5
C.C.1:2:4	63 mm	3	-	1	-	-
C.C.1:2:4	40 mm	-	2.5	1	-	0.5
C.C.1:2:4	20 mm	-	-	3	-	1
C.C.1:2:4	12.5 mm	-	-	-	3	1
C.C.1:1.5:3	63 mm	2.25	-	0.75	-	-
C.C.1:1.5:3	40 mm	-	1.88	0.75	-	0.37
C.C.1:1.5:3	20 mm	-	-	2	-	1
C.C.1:1.5:3	12.5 mm	-	-	-	2	1
C.C.1:1:2	63 mm	1.5	-	0.5	-	-
C.C.1:1:2	40 mm	-	1.25	0.5	-	0.25
C.C.1:1:2	20 mm	-	-	1.33	-	0.67
C.C.1:1:2	12.5 mm	-	-	-	1.33	0.67

The proportioning of aggregate for volumetric concrete mixes given in the above table may be varied marginally when considered necessary for obtaining better density and Strength. However, no adjustment in rate shall be made for any variation in proportioning of aggregate for works awarded on contract.

9. Design mix concrete shall be mixed with cement contents as per design or minimum required as per table below :-

Concrete Mix	Minimum cement per cum of concrete	Specified charters tics compressive strength at 7 days	Specified charters tics compressive strength at 28 days
M-20	390 kg	13.5 N/sqmm	20 N/sqmm
M-25	410 kg	17.0 N/sqmm	25 N/sqmm
M-30	420 kg	20.0 N/sqmm	30 N/sqmm
M-35	428 kg	23.5 N/sqmm	35 N/sqmm
M-40	435 kg	26.5 N/sqmm	40 N/sqmm

Nominal mix concrete shall be mixed in concrete mixer with weighted quantity of cement sand and aggregate in the ration as per table no. 2 below:-

Concrete Mix	Cement (kg)	Sand (kg)	Aggregate (kg)	Size of aggregate
M-7.5	1 Bag (50 kg)	180	445	40 mm
M-10	1 Bag (50 kg)	140	340	40mm
M-10	1 Bag (50 kg)	160	320	20mm
M-15	1 Bag (50 kg)	110	220	20mm
M-20	1 Bag (50 kg)	85	165	20mm

10. The following Indian standards may be referred to :-

I.S. No.	Title
269 – 1989	Specification for 33 grade ordinary Portland cement (fourth revision) (Reaffirmed 2004)
383 – 1970	Specifications for coarse and fine aggregates from natural sources for concrete (Second revision). (Reaffirmed 2007)
456 – 2000	Code of practice for plain and reinforced concrete (second revision) (Amdt. No.1) (Reaffirmed 2005)
457 – 1957	Code of practice for general construction of plain and reinforced concrete for dams and massive structures (Reaffirmed 2005)
516 – 1959	Method of test for strength of concrete (Amdt. No.1) (Reaffirmed 2004)
1199-1959	Method of sampling & analysis of concrete (Reaffirmed 2004)
1343-1980	Code of practice for prestress concrete (Reaffirmed 2004)
2430 - 1986	Method for sampling of aggregates for concrete. (Reaffirmed 2005)
2505-1992	General requirements for concrete vibrators immersion type. (Reaffirmed 2004)
3535-1986	Method of sampling hydraulic cement (first revision) (Reaffirmed 2004)
4031-1988 (Pt. 1 to 13)	Method of physical tests for hydraulic cement.
4032-1985	Method of chemical analysis of hydraulic cement (Reaffirmed 2005)
4082-1996	Recommendation on stacking and storage of construction materials at site (first revision) (Reaffirmed 2003)
8112-1989	Specification for 43 grade ordinary portland cement (Amdt. No. 1,2,3,4,5&6) (Reaffirmed 2005)

Item No.	Item	Unit	Rate	Remarks
701	Filling foundations and around masonry works with soft soil or sand including watering and ramming.	cum	96.00	
702	Filling foundations and around masonry works with hard soil or soft moorum including watering and ramming.	cum	114.00	
703	Filling foundations and around masonry works with hard moorum and moorum with boulder including watering and ramming .	cum	127.00	
704	Filling foundations and around masonry works with materials obtained from spoils including watering and ramming i/c 50m lead.	cum	69.00	
705	Filling foundations and around masonry works with hard moorum and picked up boulders including watering and ramming i/c 50m lead. .	cum	321.00	
706	Filling foundations and around masonry works with hard moorum and quarried boulders including watering and ramming i/c 50m lead. .	cum	496.00	
707	Filling foundation with 40 mm metal and hard moorum including watering and ramming i/c 50m lead. .	cum	663.00	
708	Filling foundations with 40mm shingle or gravel and hard moorum including watering and ramming i/c 50m lead. .	cum	411.00	
709	Labour only for filling, ramming and watering-			
	(a) Item 701 to 704	cum	69.00	
	(b) Item 705 & 706	cum	162.00	
	(c) Item 707 & 708	cum	186.00	
710	Plum cement concrete 1:2:4 with 75% graded metal of maximum size 40mm and 25% plums of 150 mm size.	cum	2048.00	
711	Plum cement concrete 1:3:6 with 75% graded metal of maximum size 40mm and 25% plums of 150mm size.	cum	1700.00	
712	Plum cement concrete 1:4:8 with 75% graded metal of maximum size 40 mm and 25% plums of 150mm size.	cum	1558.00	

Item No.	Item	Unit	Rate	Remarks
713	Cement concrete 1:1:2 with graded metal of maximum size			
	(a) 63 mm	cum	3784.00	
	(b) 40 mm	cum	3882.00	
	(c) 20 mm	cum	3941.00	
	(d) 12.5 mm	cum	3932.00	
714	Cement concrete 1:1.5:3 with graded metal of maximum size -			
	(a) 63 mm	cum	2930.00	
	(b) 40 mm	cum	2982.00	
	(c) 20 mm	cum	3097.00	
	(d) 12.5 mm	cum	3087.00	
715	Cement concrete 1:2:4 with graded metal of maximum size -			
	(a) 63 mm	cum	2467.00	
	(b) 40 mm	cum	2576.00	
	(c) 20 mm	cum	2640.00	
	(d) 12.5 mm	cum	2630.00	
716	Cement concrete 1:3:6 with graded metal of maximum size -			
	(a) 63 mm	cum	2001.00	
	(b) 40 mm	cum	2115.00	
	(c) 20 mm	cum	2184.00	
717	Cement concrete 1:4:8 with graded metal of maximum size-			
	(a) 63 mm	cum	1755.00	
	(b) 40 mm	cum	1872.00	
	(c) 20 mm	cum	1942.00	
718	Providing and laying design mix plain cement concrete with crushed graded stone aggregate 20mm nominal size using batching plant, transit mixer and concrete pump, in all works excluding cost of form work.			
	(a) Concrete mix M - 20	cum	3198.00	
	(b) Concrete mix M - 25	cum	3306.00	
	(c) Concrete mix M - 30	cum	3360.00	
	(d) Concrete mix M - 35	cum	3403.00	
	(e) Concrete mix M - 40	cum	3441.00	

Item No.	Item	Unit	Rate	Remarks
719	Labour only for mixing in mixer, laying, consolidating, curing and cleaning-			
	(a) Items 710 to 717	cum	384.00	
720	Deduct for hand mixed concrete -			
	(a) Item 710 to 717	cum	186.00	
	(b)Item 719(a)	cum	46.00	
721	Extra for mechanical vibration of cement concrete or plum concrete	cum	51.00	
722	Extra rate for every additional 1.5m height (or depth) or part thereof.	cum	22.00	
723	Deduct for graded shingle or gravel (for one cum of concrete) -			
	(i) Items 713 (a)	cum	101.00	
	(ii) Items 713 (b)	cum	131.00	
	(iii) Items 713 (c)	cum	213.00	
	(iv) Items 713 (d)	cum	251.00	
	(v) Items 714 (a)	cum	107.00	
	(vi) Items 714 (b)	cum	140.00	
	(vii) Items 714 (c)	cum	227.00	
	(viii) items 714 (d)	cum	268.00	
	(ix) items 715 (a)	cum	111.00	
	(x) items 715 (b)	cum	145.00	
	(xi) items 715 (c)	cum	236.00	
	(xii) items 715 (d)	cum	277.00	
	(xiii) items 716 (a)	cum	118.00	
	(xiv) items 716 (b)	cum	153.00	
	(xv) items 716 (c)	cum	249.00	
	(xvi) items 717 (a)	cum	121.00	
	(xvii) items 717 (b)	cum	157.00	
	(xviii) items 717 (c)	cum	255.00	
724	Shuttering for faces of concrete for steps in sloping foundations.	cum	80.00	
725	Filling foundations with 40-mm metal including screening, filling and hand packing around pipes.	cum	551.00	
726	Labour only for item 727	cum	93.00	

Item No.	Item	Unit	Rate	Remarks
727	Cost of water for curing only and included in items 710 to 721	One cum of concrete	72.00	
728	Cost of water for ramming in items 701 to 708 and 727	One cum of work	14.00	
729	Labour for curing only and included in items 722	One cum of concrete	81.00	

CHAPTER 8

STONE MASONRY AND PRECAST BLOCK MASONRY WORK

Notes :-

1. Rates include –
 - (a) Lead up to 100 m for all materials for all items.
 - (b) Cost of all materials including water.
 - (c) All lifts for all items unless otherwise specified.
 - (d) Cost of mixing cement mortar
 - (e) Cost of curing.

2. The rates for stone masonry in superstructure include the cost of scaffolding

3. Work in foundation and plinth:- For purpose of measurement of masonry work in foundation and plinths it shall be determined as follows :-
 - (a) For building- masonry work below ground floor level or 1.2 m above average ground level, whichever is lower.
 - (b) For abutments, piers and retaining walls of culverts, bridges, wall of reservoirs, septic tanks, basement and other similar works up to 1.5 m above top of foundation concrete.

4. Work in superstructure :-
 - (a) For all works above the level specified in 3(a) and 3(b) above.
 - (b) For compound wall, parapet wall over retaining wall-Entire work above the average ground level.

5. Masonry for masonry work up to 15 m height
 - (a) Classification of masonry –
 - (i) Plain ashlar – every stone shall be cut to the required size and shape, chisel dressed on all beds and joints so as to be free from bushings dressed surface shall not show a depth of gap of more than 3 mm from straight edge placed on it. The exposed faces and joints, 6mm from the face shall be fine tooled so that a straight edge can be laid along the face of the stone in contact with every point. All visible angles and edges shall be true and square and free from chippings. The corner stones (quions) shall be dressed and perpendicular.
 - (ii) Ashlar rough tooled – The dressing of stone blocks shall be similar to plain ashlar except that face exposed in view shall have fine chisel draft 2.5cm wide round the edges and shall be rough tooled between the draft such that the dressed surface shall not deviate more than 3mm from the straight edge placed over it.
 - (iii) Ashlar rock (Quarried) faced – The dressing of stone blocks in case of ashlar rock shall be similar to ashlar rough tooled except that the exposed faces of the stone between

the drafts shall be left rough as the stone comes from the quarry; but no rock face or busing shall project more than 7.5 cm from place of drafts.

- (iv) Squared rubble masonry coursed (first sort):- Face stones shall be hammer dressed on all beds and joints so as to give them approximately rectangular shape. These shall be square all joints & on bed. The bed joints shall be rough chisel dressed for at least 75 mm back from the face, and the side's joints at least 40mm back from the face, placed on it No portion of the dressed surface shall show a depth of gap more than 6mm from a straight edge placed on it. The remaining portion of the respective surfaces shall no project above the chisel dressed bed and side joints. The bushing on the face shall not project by more than 40mm on an exposed face.
 - (v) Squared rubble masonry coursed (second sort):- All requirements are the same as for coursed rubble masonry (first sort) except that no portion of dressed surface of joints shall show a depressions of more than 10 mm (as against 6 mm for first sort) from the straight edge placed against the dressed surface.
 - (vi) Hammer dressed coursed rubble masonry – Face stone shall be hammer dressed on all beds and joints, so as to give them approximately rectangular shape. The bed and side joints shall be hammer dressed for 75mm from face. The bushing on the face shall not be more than 4cm on the exposed face.
 - (vii) Random rubble or uncoursed masonry- Stones used for uncoursed or random rubble masonry work shall be hammer dressed on the sides and bed in such a way as to close up with the adjacent stone in masonry work as strongly as possible. The face of stones shall be so dressed that bushing ob the exposed face shall not project by more than 4 cm from the general wall surface
- (b) Bond Stones :- Through bond stones shall be provided in walls up to 60 cm thick and in case of walls above 60 cm thickness, a set of two or more bond stones overlapping each other by at least 15 cm shall be provided in line from face to back. Each bond stones or a set of bond stones shall be provided at 1.5 m to 1.8 m apart clear in each course. The bond stones shall be staggered in successive courses and marked for identification.
 - (c) Plum stones (Pin-header):- Pin header or plum stones shall be provided in hearting at about 1.8 m interval (both across and along). They shall run through the height of at least two courses. Their position shall be staggered in successive courses.
 - (d) Joints – the maximum thickness of joints shall be 6 mm various types of ashlar masonry, 10 mm for squared rubble masonry coursed (first sort), 15mm for squared rubble masonry (second sort), 20mm for hammer dressed coursed rubble masonry and 35 mm for random rubble uncoursed masonry.

6. Masonry for masonry works having maximum height 15 m (height means structural height above lowest foundation level and is applicable for entire length of dams) and other massive structures:-
- (a) Face Masonry:- Face stones shall be hammer dressed on face and one line chisel dressed (finishing given to the stone face with no portion of it projecting more than 10 mm from the straight edge laid along the face of the stone) on bed, top and sides for a minimum depth of 75mm up to which the stones shall be true and rectangular. Beyond 75mm. Bushing on the faces of the stones shall not project more than 40 mm.
 - (b) Coursed rubble masonry- Face stones shall be hammer dressed on face, on bed, sides and bed for 75 mm with the course normal to the face batter. The bushing on the faces of the stones shall not project more than 40mm.
 - (c) Random rubble masonry – The hearting is of random rubble work.
7. Stone block masonry – (a) Stone masonry blocks of size 29x19x14 cm actual (30x20x15cm nominal) shall be precast in cement concrete 1:3:6 with stone ballast of maximum size 20 mm and stone 5 to 15 cms in size. The quantity of stone pieces to be used in a block shall be about 33% by volume. Blocks of 1/3rd and 2/3rd of above size shall be used for bond purpose. The minimum average compressive strength of block shall be 5 N/sqmm.
- (b) The blocks shall be cast as per CBRI Technical Note No.7. The various steps in casting are as follows :-
 - (i) Apply oil (grease and kerosene oil 1:4 ratio) on casting platform and place the moulds in row.
 - (ii) Arrange large size stone 12-cm size or so inside the mould, generally two or three stones will be laid.
 - (iii) Fill up the gaps between the stone pieces in the lower portion of the mould up to a height of about 5 cm with cement concrete of mix 1:4:8 and compact by trowel. The cement concrete should have low water cement ratio so as to give a stiff mix.
 - (iv) Fill up the remaining portion by placing 60 to 75 mm pieces in gaps and again pour the same cement concrete mix up to top and compact by roding/tamping/vibrating.
 - (v) The demoulding is done after 3 to 4 minutes of casting the block by putting a wooded piece on top of the block cast and pulling the mould up.
 - (vi) The next day of casting, the blocks are turned upside down and stone texture kept exposed . The blocks are remixed and cured with water for 7 days and air dried for 3 weeks before using in masonry.
 - (c) Mortar – Cement mortar 1:6 shall be used.
 - (d) Laying the blocks shall be slightly wetted before or during laying in the wall, 1/3rd and 2/3rd size blocks shall be used for completing the bond. The thickness of joints shall be 1 cm and it shall be ensured that all horizontal and vertical joints are completely filled with mortar without any void left in masonry.

8. Measurements – (i) Dimensions shall be measured correct to the nearest cm. The area shall be calculated in sqm correct to two places of decimal and cubical contents in cum correct to two places of decimal.
- (ii) No deduction or addition shall be made for the following -
- (a) Ends of dissimilar materials (that is joists, beams, lintels, posts, girders, rafters., purlins, trusses, corbels steps, etc.) up to 0.1 sqm in section.
- (b) Opening up to 0.1 sqm in area (in calculating area of an opening any separate lintels or sills shall be included with the size of opening but end portions of lintel shall be excluded and extra width of rebated reveals if any, shall also be excluded).
- (c) Cement concrete blocks for hold fasts, holding down bolts and the like.
- (d) Iron fixtures such as wall tie, pipes up to 300 mm dia. and hold fasts of doors and windows.
9. The payment for polygonal rubble walling shall be admissible as per the rates for item No. 806.
10. (a) Where specifications of face masonry, differ from those of hearting , rate of face masonry will be payable as per actual width limited up to 60cm from the face.
- (b) Double face masonry shall be payable for actual width or up to 60cm, whichever is less, for each side.
11. (a) The stones for masonry shall be hard, durable, tough, sound and clean .They should be free from decay, weathered faces, soft seams, adhering coating, sand holes, veins, flaws, cracks , stains and other defects and shall have, as far as possible, uniform colour and texture. Stones not uniform in colour, texture and / or with stains may be permitted after proper tests.
- (b) Stones For Random Rubble masonry – The size of the stone shall be normally vary from 0.05 to 0.01 cum. No stone larger than the maximum specified size of 0.05 cum. should be used (in general). The stones shall be taken from quarries approved from the geological and engineer in charge consideration. The stone shall weigh less than 25 kg. The stones used in hearting shall be roughly cubical in shape. No stones weighing between 75kg and 150kg shall be less than 225 mm in any direction and no stone weighing between 25kg and 75 kg shall be less than 150 mm in any direction.
- (c) Spalls with minimum dimension of 200mm to 100mm shall be used to wedge in to thick mortar spaces. They shall not normally exceed 10% of the volume of stone masonry.
12. The following Indian Standards may be referred to

I.S. No.	Title
1129-1972	Recommendation for dressing of material, building stones (first revision) (Reaffirmed 2003)
1597-1992	Code of practice for construction of stone masonry (Reaffirmed 2007)
1597 (Part I) – 1992	Code of Practice for construction of stone masonry-Rubble stone masonry. (Reaffirmed 2007)
1597 (Part II)- 1967	Code of practice for construction of stone masonry-Ashlar masonry.

2116-1980	Sand for masonry mortar (Reaffirmed 2002)
2185-Pt.-I-2005	Hollow and solid concrete blocks (second revision)
2185-Pt.-II-1983	Hollow and solid light weight concrete blocks (first revision) (Reaffirmed 2005)
2250-1981	Preparation & use of masonry mortars (Reaffirmed 2000)
8605-1977	Code of practice for construction for masonry in dams. (Reaffirmed 1998)
9394-1979	Specification for stone lintels (Reaffirmed 2003)
11216-1985	Permeability test for masonry during and after construction.

Item No.	Item	Unit	Rate	Remarks
801	Plain ashlar masonry in superstructure in			
	(a) Cement mortar 1:2	cum	5513.00	
	(b) Cement mortar 1:3	cum	5360.00	
	(c) Cement mortar 1:4	cum	5288.00	
	(d) Cement mortar 1:5	cum	5243.00	
	(e) Cement mortar 1:6	cum	5207.00	
	(f) Cement mortar 1:8	cum	5172.00	
802	Labour only for dressing of stones for plain ashlar masonry.	cum	2760.00	
803	Labour only for plain ashlar masonry in superstructure including labour for scaffolding dressing, making mortar and curing for :			
	Item 801 (a) to 801 (f)	cum	4258.00	
804	Deduct from item 801 to 803 for ashlar rough tooled masonry.	cum	691.00	
805	Deduct from item 801 to 803 for ashlar rock (quarried) faced masonry.	cum	1036.00	
806	Squared rubble masonry coursed (first sort) in superstructure in :			
	(a) Cement mortar 1:2	cum	3459.00	
	(b) Cement mortar 1:3	cum	3014.00	
	(c) Cement mortar 1:4	cum	2804.00	
	(d) Cement mortar 1:5	cum	2673.00	
	(e) Cement mortar 1:6	cum	2569.00	
	(f) Cement mortar 1:8	cum	2464.00	

Item No.	Item	Unit	Rate	Remarks
807	Labour only for squared rubble masonry coursed (first sort) in superstructure including labour for scaffolding, dressing, making mortar and curing for - Item 806 (a) to 806 (f)	cum	1403.00	
808	Squared rubble masonry coursed (second sort) in superstructure in - (a) Cement mortar 1:2 (b) Cement mortar 1:3 (c) Cement mortar 1:4 (d) Cement mortar 1:5 (e) Cement mortar 1:6 (f) Cement mortar 1:8	cum cum cum cum cum cum	3258.00 2812.00 2603.00 2472.00 2361.00 2262.00	
809	Labour only for squared rubble masonry coursed (second sort) in superstructure including labour for scaffolding, dressing, making mortar and curing for. Item 808 (a) to 808 (f)	cum	1201.00	
810	Hammer dressed coursed rubble masonry in superstructure in - (a) Cement mortar 1:2 (b) Cement mortar 1:3 (c) Cement mortar 1:4 (d) Cement mortar 1:5 (e) Cement mortar 1:6 (f) Cement mortar 1:8	cum cum cum cum cum cum	3080.00 2635.00 2425.00 2294.00 2189.00 2084.00	
811	Labour only hammer dressed coursed rubble masonry in super structure including labour for scaffolding, dressing, making mortar and curing for- Item 810 (a) to 810 (f)	cum	1023.00	
812	Uncoursed and random rubble masonry in super structure in - (a) Cement mortar 1:2 (b) Cement mortar 1:3 (c) Cement mortar 1:4 (d) Cement mortar 1:5 (e) Cement mortar 1:6 (f) Cement mortar 1:8	cum cum cum cum cum cum	3049.00 2514.00 2263.00 2105.00 1980.00 1854.00	

Item No.	Item	Unit	Rate	Remarks
813	Labour only for uncoursed random rubble masonry in superstructure including labour for scaffolding , dressing, making mortar and curing for Item 812 (a) to 812 (f)	cum	728.00	
814	Dry random rubble masonry	cum	946.00	
815	Labour only for item 814	cum	231.00	
816	Face stone masonry in cement mortar in superstructure			
	(a) Strength 14 N/Sqmm	Cum	3295.00	
	(b) Strength 10.5 N/Sqmm	cum	3060.00	
817	Coursed rubble masonry in cement mortar in superstructure -			
	(a) Strength 14 N/Sqmm	Cum	3029.00	
	(b) Strength 10.5 N/Sqmm	cum	2793.00	
	(c) Strength 8 N/Sqmm	cum	2688.00	
818	Random rubble masonry in cement mortar in superstructure -			
	(a) Strength 14 N/Sq. mm	Cum	2737.00	
	(b) Strength 10.5 N/Sq. mm	cum	2454.00	
	(c) Strength 8 N/Sqmm	cum	2328.00	
819	Providing and fixing fine dressed cut stone lintels including setting in cement mortar 1:3	cum	6155.00	
820	Labour only for Item 819 including dressing	cum	1567.00	
821	Providing and fixing fine dressed cut stone copings, cornices string courses and plinth courses including setting in cement mortar 1:6	cum	5495.00	
822	Labour only for item 821 including dressing.	cum	2243.00	
823	Stone block masonry with solid stone masonry blocks of approved size pre cast in cement concrete 1:4:8 with graded stone ballast of maximum size 20mm, laid in cement mortar 1:6 including from work for pre casting, curing, handling, hoisting etc. complete.	cum	2793.00	
824	(a) Cost of pre cast solid stone masonry blocks only in item 823	cum	1965.00	
	(b) Cost of item 823 excluding cost of pre cast solid stone masonry blocks	cum	744.00	

Item No.	Item	Unit	Rate	Remarks
825	Labour only for -			
	(a) Item 824 (a)	cum	721.00	
	(b) Item 824 (b)	cum	589.00	
826	Chisel dressed grooves in stone for karris-			
	(a) Size 8 cm x 5 cm	m	265.00	
	(b) Size 10 cm x 8 cm	m	354.00	
	(c) Size 15 cm x 10 cm	m	505.00	
827	Deduct for stone masonry in plinth and foundation (item 801,806,808,810,812,816, 817,818,823 & 824 (b).	cum	90.00	
828	Deduct for labour only in plinth and foundation (item 803, 807, 809, 811, 813 and 825 (b)	cum	65.00	
829	Extra rate for every additional floor or every additional 3 m height or part thereof for such works which have no intermediate floor.	cum	93.00	
830	Extra rate for stone masonry circular in plan, including walls, to a mean radius not exceeding 6 m.	cum	130.00	
831	Extra rate for stone masonry in well steining for depth -			
	(a) Up to 6 m	cum	93.00	
	(b) Beyond 6 m to 12 m	cum	151.00	
	(c) Beyond 12 m to 18 m	cum	216.00	
	(d) Beyond 18 m to 24 m	cum	325.00	
	(e) Beyond 24 m to 30 m	cum	499.00	
832	Extra rate for stone masonry in square or rectangular pillars	cum	193.00	
833	Extra rate for stone masonry in circular pillars.	cum	481.00	
834	Deduct from item 823 and 824(a) for use of graded shingle or gravel	cum	305.00	
835	Deduct for masonry with stones obtained from foundation excavation and collection of materials.	cum	297.00	
836	Cost of water for curing only and included in item 806, 808, 810, 812, 815, 816, 817, 824(a) and 824(b)	One cum of masonry	83.00	
837	Labour for curing only and included in item 803,807,809,811,813,815,816,817 and 825.	One cum of masonry	102.00	

CHAPTER 9 - BRICK MASONRY

Notes :-

1. Rates include :-
 - (a) Lead up to 100m for all materials for all items.
 - (b) Cost of all materials including water.
 - (c) All lifts for all items unless otherwise specified.
 - (d) Cost of mixing cement mortar and preparing lime mortar.
 - (e) Cost of curing.
2. The rates for brick masonry in superstructure include the cost of scaffolding.
3. Work in foundation and plinth:- For purpose of measurement of masonry work in foundation and plinths it shall be determined as follows :-
 - (a) For building-masonry work below ground floor level or 1.2m above average ground level, whichever is lower.
 - (b) For abutments, piers and retaining walls of culverts, bridges, walls of reservoirs, septic tanks, basement and other similar works-up to 1.5m above top of foundation concrete.
4. Work in superstructure: - (a) For all works above the level specified in 3(a) and 3(b) above.
 - (b) For compound wall, parapet wall over retaining wall-Entire works above the average ground level.
5. Standard modular brick of size 19cm x 9cm x 9cm shall be used.
6. Classification of brick masonry :- (a) The common burnt clay brick shall be classified on the basis of minimum average compressive strength . Each class of bricks shall be further divided into two classes, first class and second class, based on tolerance and shape.
 - (b) The various types of bricks when tested in accordance with I.S. 3495 (Part I) – 1976 shall have minimum average compressive strength as follows :-

(i) First class table moulded (TM) chimney kiln burnt brick/Grog or Ghol bricks.	50kg/sq cm
(ii) Second class TM. chimney kiln burnt brick	35kg/sq.cm
(iii) Second class TM. open bhatta or pajawa burnt brick	30kg/sq.cm
(iv) Kumhar bricks burnt in Pajawa	20kg/sq.cm

- (c) Tolerance:- The dimensions of bricks when tested in accordance with IS-1077-1976 shall be within the following limits per 20 bicks -
 - (i) For bricks of class Designation 50 and 35kg/sq.cm.

Length	372 to 388 cm (380 ± 8 cm)
Width & height	176 to 184 cm (180 ± 4 cm)

(ii) For bricks of class Designation 30 kg /sq.cm.

Length	368 to 392 cm (380 ± 12cm)
Width & height	174 to 186 cm (180 ± 6 cm)

(iii) For bricks of class Designation 20 kg / sq.cm.

Length	350 to 410 cm (380 ± 30 cm)
Width & height	165 to 195 cm (180 ± 15 cm)

7. Measurements- (i) Dimensions shall be measured correct to the nearest cm. The area shall be calculated in Sq. m. correct to two places of decimal and cubical contents in cum correct to two places of decimal.

(ii) The brick walls up to three bricks in thickness shall be measured in multiples of half brick, which shall be deemed to be inclusive of mortar, viz.

½ brick wall	10 cm
1 brick wall	20 cm
1½ brick wall	30 cm
2 brick wall	40 cm

and so on Irrespective of excess of executed width. However width or thickness in no case be less than specified above.

(iii) Where fractions of half brick occur due to architectural or other reasons, measurements shall be taken as follows:

- (a) up to 1¼ brick-actual measurements.
- (b) Exceeding 1¼ brick-full half-brick.
- (iv) For walling which is more than three bricks in thickness actual thickness of wall shall be measured.
- (v) the full area of honey comb brick wall shall be measured without deduction for openings.
- (vi) No deductions or additions shall be made on any account for the following:-
 - (a) Ends of dissimilar materials (that is, joists, beams, lintels, posts, girders, rafters, pulins, trusses, corbels, steps etc.), up to 0.1 Sqm in section.
 - (b) Opening up to 0.1 Sqm in area (in calculating area of an opening , any separate lintels or sills shall be included with the size of opening but end portions of lintel shall be excluded and extra width of rebated reveals, if any, shall also be excluded).
 - (c) Wall plates, bed plates and bearing of slabs, chazzas and the like, where thickness does not exceed 10 cm and bearing does not extend over the full thickness of wall.
 - (d) Cement concrete blocks for hold fasts and holding down bolts.

- (e) Iron fixtures, such as wall ties, pipes up to 300 mm dia and hold fasts for doors and windows.
- (f) Chases of sections not exceeding 50cm in girth..
8. Rectangular pillar / column shall mean a detached masonry portion such that its breadth does not exceed three times its thickness and thickness itself does not exceed three brick lengths.
9. The following Indian standards may be referred to:-

I.S. No	Title
1077-1992	Specifications for common burnt clay building bricks (third revision) (Reaffirmed 2002)
1905-1987	Code of practice for structure safety of buildings, Masonry walls (first revision).
2212-1991	Code of practice for brick work (with amendment No.1)
3102-1971	Classification of burnt clay solid bricks (second revision)
3414-1968	Code of practice for design & installation of joints in buildings.
3495 - 1992	methods of tests of burnt clay building bricks
5454 – 1978	Methods for sampling of clay building bricks (first revision) (Reaffirmed 2006)

10. The bricks specified under Notes 906 of this chapter shall not be used without written prior permission of the Chief Engineer/Superintending Engineer.

Item No.	Item	Unit	Rate	Remarks
901	Second class T.M. open bhatta or pajawa burnt brick masonry in superstructure in-			
	(i) Cement mortar 1:2	cum	2772.00	
	(ii) Cement mortar 1:3	cum	2504.00	
	(iii) Cement mortar 1:4	cum	2379.00	
	(iv) Cement mortar 1:5	cum	2300.00	
	(v) Cement mortar 1:6	cum	2237.00	
	(vi) Cement mortar 1:8	cum	2174.00	
902	Fly ash brick (with the use of ash cement and sand) masonry in superstructure in -			
	(i) Cement mortar 1:2	cum	2436.00	
	(ii) Cement mortar 1:3	cum	2169.00	
	(iii) Cement mortar 1:4	cum	2043.00	
	(iv) Cement mortar 1:5	cum	1965.00	

Item No.	Item	Unit	Rate	Remarks
	(v) Cement mortar 1:6	cum	1902.00	
	(vi) Cement mortar 1:8	cum	1839.00	
903	(a) Add for arch masonry in item 901 for span up to 6 m excluding centering.	cum	138.00	
	(b) Centering for arch masonry in item 901 for span up to 6m	cum	463.00	
904	Deduct for Kumhar brick burnt in Pajawa in items 901	cum	112.00	
905	Add for second class TM Chimney Kiln burnt brick in items 901	cum	84.00	
906	Add for first class TM Chimney Kiln burnt/ Grog/ Ghol brick in items 901	cum	224.00	
907	Deduct for masonry in plinth and foundation	cum	123.00	
908	(a) Labour only for item 901 & 902 including labour for scaffolding making mortar & curing.	cum	630.00	
	(b) Deduct from item 908(a), for plinth and foundation.	cum	96.00	
909	(a) Labour only for arch masonry up to 6m span excluding centering but including labour for making mortar and curing.	cum	763.00	
	(b) Labour only for assembling, erection, dismantling and cleaning of centering for arch up to 6 m span.	cum	276.00	
910	Extra rate for one-brick or half-brick wall	cum	138.00	
911	Add extra for every additional floor or every additional 3-m height or part thereof for such works which have no intermediate floor.	cum	209.00	
912	Extra rate for brick masonry circular in plan. Including wells, to a mean radius not exceeding 6m.	cum	15% extra over superstructure	
913	Extra rate for brick masonry in well steining for depth -			
	(a) up to 6m	cum	74.00	
	(b) Beyond 6 m to 12 m	cum	116.00	
	(c) Beyond 12 m to 18 m	cum	186.00	
	(d) Beyond 18 m to 24 m	cum	279.00	
	(e) Beyond 24 m to 30 m	cum	395.00	

Item No.	Item	Unit	Rate	Remarks
914	Extra rate for brick masonry in square or rectangular pillars.	cum	10% extra over superstructure	
915	Extra rate for brick masonry in circular pillars.	cum	15% extra over superstructure	
916	Honey comb brick masonry with second class T.M. open bhatta or Pajawa burnt bricks in -			
	(a)Cement mortar 1:3	cum	1542.00	
	(b)Cement mortar 1:4	cum	1512.00	
	(c)Cement mortar 1:5	cum	1494.00	
	(d)Cement mortar 1:6	cum	1479.00	
	(e)Cement mortar 1:8	cum	1464.00	
917	Deduct from item 916 Kumhar brick burnt in Pajawa	cum	81.00	
918	Add to item 916 for second-class TM. Chimney burnt/Grog/Ghol brick	cum	61.00	
919	Add to item 916 for first class TM. Chimney burnt/Grog/Ghol brick	cum	163.00	
920	(a) Labour only for item 916 (a) to (e) including labour for scaffolding, making mortar and curing.	cum	551.00	
921	Second class T.M. open bhatta or Pajawa burnt dry brick masonry for soak pits.	cum	1462.00	
922	Deduct from item 921 for Kumhar brick burnt in Pajawa	cum	112.00	
923	Labour only for item 921	cum	232.00	
924	Making triangular brackets for sunshade over doors and windows in cut second class TM. Chimney burnt brick including corbelling in cement mortar 1:3	cum	3374.00	
925	Add to item 924 for first class TM. Chimney burnt/Grog/Ghol brick.	cum	224.00	
926	Labour only for item 924 including labour for scaffolding, making mortar and curing	cum	924.00	
927	Chamfering, rounding masonry (other than circular pillars)	cum	39.00	
928	Cost of water for curing only and included in items 901, 916 & 924	One cum of masonry	79.00	
929	Labour for curing only and included in items 908 (a) , 909 (a), 920 and 926.	One cum of masonry	92.00	

CHAPTER 10 – FLOORING AND PITCHING

Notes : -

1. Rates include -
 - (a) Lead up to 100m for all materials unless otherwise specified.
 - (b) Cost of all materials including water.
 - (c) All lifts for all materials.
 - (d) Cost of curing.
2. Lead for flag stones, mosaic and terrazzo tiles shall be measured from the nearest railway station or market place, whichever is nearer.
3. Cement slurry @ 2Kg per Sqm shall be applied before laying of under layer on the cement concrete/RCC surface so as to get a good bond. The cost of relevant items includes cost of the cement slurry.
4. No deduction for voids shall be made from the gross measurement of pitching.
5. For concrete with aggregates like shingle, gravel and boulders, the rates will be worked out by direct subtraction of difference in rates of metal and shingle, gravel and boulders given in Chapter 5 from the rates of corresponding mix of the concrete.
6. Mosaic Terrazzo Tiles :- Where the average size of chips are 6mm and below, this shall be termed as "mosaic Tiles" and where the average size of chips is more than 6 mm these shall be termed as "Terrazzo Tiles".
7. The shade of cement slurry required for floating and striking joints shall be of the same shade as those of tiles (mosaic / Terrazzo / Glazed Vitreous).
8. Measurements: - Length and breadth shall be measured correct to a cm and its area as laid shall be calculated in sqm correct to two places of decimal. Length and breadth shall be measured before laying skirting, dado or wall plaster. No deduction shall be made nor extra paid for any opening in the floor, for area up to 0.10 sqm
9. For flooring the floor shall be divided in to panels not exceeding 2 sqm in area & also joints shall be so located that the longer dimension of any panels does not exceed 2m.
10. The following Indian Standards may be referred to:-

I.S. No.	Title
1237-1980	Cement concrete flooring tiles (first revision) (Reaffirmed 2006)
1443-1972	Code of practice for laying and finishing of cement concrete flooring tiles (first revision) (Reaffirmed 2006)

2114-1984	Code of Practice for laying in- situ terrazzo floor finish (First revision) (Reaffirmed 2006)
2571-1970	Code of Practice for laying in-situ cement concrete flooring (first revision) (Reaffirmed 2006)
3461-1980	PVC (Vinyl) asbestos floor tiles. (Reaffirmed 2006)
3622-1977	Sand stone (slabs & tiles) (First revision) (Reaffirmed 2003)
5318-1969	Code of practice for laying of flexible PVC sheet and tile flooring (Reaffirmed 2006)

Item No.	Item	Unit	Rate	Remarks
1001	Filling in plinth the material obtained from spoils including watering and ramming in 15 cm layers including 50 m lead and 1.5 m lift.	cum	70.00	
1002	Providing and laying flag stone flooring (any pattern and design) over and including average 20mm thick bedding of cement mortar 1:6 and cement pointing in cement mortar 1:3, striking Joints, curing- and cleaning			
	(a) 20-25 mm thick flag stone (sand stone)	sqm	282.00	
	(b) 30-40 mm thick flag stone (sand stone)	sqm	307.00	
	(c) 40-50 mm thick flag stone (sand stone)	sqm	357.00	
1003	Labour only for item 1002	sqm	77.00	
1004	22cm thick grouted stone pitching (without quarry- spalls) with individual stones of 22 cm depth and minimum size 0.014 cum In cement mortar 1:6	cum	1005.00	
1005	Labour for item 1004	cum	192.00	
1006	22 cm thick dry stone pitching (without quarry spall) with individual stones of 22cm depth and minimum size 0.014 cum	cum	658.00	
1007	Labour only for Item 1006	cum	144.00	
1008	(a) 30 cm thick dry stone pitching (without quarry spalls) with individual stones of 30 cm depth and minimum size 0.021 cum. (b) Labour only for item 1008 (a)	cum	749.00	
		cum	144.00	
1009	22cm thick dry picked up boulder pitching including picking of boulders with individual boulders of 22 cm depth and at least the dimension of boulders in any direction should not be less than 10cm	cum	322.00	
1010	Labour only for item 1009	cum	190.00	

Item No.	Item	Unit	Rate	Remarks
1011	Add extra to item 1009 for quarried boulder pitching.	cum	132.00	
1012	(a) Providing stone chips under stone pitching.	cum	248.00	
	(b) Providing picked up boulder spalls under pitching.	cum	178.00	
1013	Labour only for item 1012(a) & (b)	cum	46.00	
1014	Improved terrace flooring 75mm thick in cement concrete 1:3:6 with 40mm graded metal laid in panels including finishing with neat cement floating, curing etc. complete.	sqm	213.00	
1015	Improved terrace flooring 75mm thick in cement concrete 1:2:4 with 40 mm graded metal laid in panels including finishing with neat cement floating, curing etc. complete.	sqm	251.00	
1016	Labour only for Item 1014 & 1015	sqm	43.00	
1017	Improved terrace flooring 40mm thick in cement concrete 1:2:4 with 20mm graded metal laid in panels including finishing with neat cement floating, curing, etc. complete.	sqm	159.00	
1018	Improved terrace flooring 40mm thick in cement concrete 1:1.5:3 with 20 mm graded metal laid in panels including finishing with neat cement floating, curing, etc. complete.	sqm	180.00	
1019	Labour only for items 1017 and 1018	sqm	30.00	
1020	75mm thick cement concrete base 1:4:8 under flooring with 40 mm graded metal including finishing, curing, etc., complete.	sqm	154.00	
1021	Labour only for item 1020	sqm	29.00	
1022	40mm thick marble chips flooring rubbed and polished to granitic finish with under layer of 32mm thick cement concrete 1:2:4 (with 12.5 mm graded metal) and top layer of 8mm thick white, black or white and black marble chips of required sizes from 1mm to 4mm nominal size laid in cement marble powder mix 3:1 (3 cement : 1 marble powder by weight) in proportion of 4:7 (4 cement marble powder mix : 7 marble chips by volume).	sqm	345.00	
1023	Labour only for Item 1022 including laying of sub floor of cement concrete	sqm	209.00	

Item No.	Item	Unit	Rate	Remarks
1024	Marble chips skirting or dado (up to 30 cm height) rubbed and polished to granilitic finish, with top layer of 6 mm thick white, black or white & black marble chips of sizes from smallest to 4mm nominal size laid in cement marble powder mix 3:1 (3 cement : 1 marble powder by weight in proportion of 4:7 (4 cement marble powder mix : 7 marble chips by volume) and 22mm thick under layer with 15mm thick cement plaster 1:3 (1cement : 3 sand).	sqm	321.00	
1025	(a) Add extra to item No. 1022 -			
	(i) Dark shade pigment with ordinary cement.	sqm	27.00	
	(ii) Light shade pigment with white cement	sqm	112.00	
	(iii) medium shade pigment	sqm	90.00	
	(b) Add extra to item 1024 for			
	(i) Dark shade pigment with ordinary cement	sqm	26.00	
	(ii) Light shade pigment with white cement.	sqm	98.00	
	(iii) medium shade pigment	sqm	80.00	
1026	Labour only for item No. 1024	sqm	218.00	
1027	(a) Providing & laying 20mm thick plain mosaic tile flooring, with indigenous (Indian) marble chips, over and including 20mm thick sub base cement mortar 1:6 and including cement floating, filling joints with neat cement slurry, curing, rubbing, wax polishing and finishing with oxalic acid complete-			
	(i) Plain mosaic tile in natural grey shade.	sqm	465.00	
	(ii) Plain mosaic tile in red chocolate or yellow shade.	sqm	555.00	
	(iii) Plain mosaic tile in any shade other than (i) & (ii) above	sqm	596.00	
	(b) Add for plain terrazzo tiles in place of plain mosaic tiles.	sqm	136.00	
	(c) Add for chequered mosaic tiles in place of plain mosaic tiles	sqm	127.00	
	(d) Add for chequered terrazzo tiles in place of plain mosaic tiles.	sqm	154.00	

Item No.	Item	Unit	Rate	Remarks
	(e) Deduct for plain cement tiles in place of plain mosaic tiles.	sqm	136.00	
	(f) Without cost of tiles	sqm	210.00	
1028	Labour only for item 1027	sqm	158.00	
1029	Providing and laying 6mm thick plain vitreous glazed type tiles flooring over and including 20 mm thick sub base of cement mortar 1:6 and including cement floating, fillings joint with neat cement slurry, curing and including border tiles, if any-			
	(a) In white colour tiles	sqm	797.00	
	(b) In colour tiles (any required shade)	sqm	861.00	
	(c) Without cost of tiles	sqm	209.00	
1030	Labour only for item 1029	sqm	111.00	
1031	Extra for providing and fixing glass strips in joints of floors 40mm wide and 4mm thick	M	9.00	
* 1032	15mm thick Marble stone tile flooring over 18mm (Average) thick base of cement mortar 1:4 (1 cement : 4coarse sand) laid and jointed with grey cement slurry including grinding rubbing and polishing etc. complete. (Area of tile should be 0.18 sqm and above)			
	(a) Makrana white second quality	sqm	1299.00	
	(b) Raj Nagar plain	sqm	645.00	
	(c) Agaria White	sqm	936.00	
	(d) Black Zebra	sqm	645.00	
	(e) Udaipur green marble	sqm	659.00	
	(f) Pink plain marble	sqm	810.00	
	(g) Wonder marble	sqm	1356.00	
	(h) Katni marble	sqm	702.00	
1033	15mm thick Marble tiles in risers and treads of steps skirting dado and pillars laid on 12mm (Average) thick base of cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry including rubbing and polishing etc. complete (Area of tiles to be upto 0.18 sq.m)			
	(a) Agaria White	sqm	993.00	

Item No.	Item	Unit	Rate	Remarks
	(b) Black Zebra	sqm	702.00	
	(c) Udaipur green marble	sqm	717.00	
	(d) Pink plain marble	sqm	547.00	
1034	Extra Extra for using white cement slurry instead of grey cement slurry in joints of marble stone flooring or tiles for all thickness	sqm	11.00	
1035	Extra Extra for nosing in marble stone for treads	sqm	52.00	
1036	25 25 25 mm thick KOTA stone slab flooring over 20mm (Average) thick base of cement mortar 1:4 laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including grinding rubbing and polishing etc. complete (Area of slab to be over 0.20 sq.m and upto 0.50 sq.m)	sqm	570.00	
1037	KOTA KOTA stone slab 25mm thick in risers and treads of steps, skirting dado and pillar laid in 12mm (Average) thick cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete. (single stone is to be used for riser and treads of steps and the width of stone for skirting and dado shall be equal to the height of skirting/ dado with a minimum length of 1.0 M.)	sqm	635.00	
1038	25mm 25mm wooden planking tongued and grooved in flooring including fixing with iron screws complete with teak wood	m	2775.00	
1039	25mm 25mm wooden planking tongued and grooved in flooring including fixing with iron screws complete with Other than teak wood such as sal, haldoo and Bija	m	1517.00	
1040	38 mm thick parquet (wood blocks) flooring of teak wood laid over 25mm thick leveling layer of cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10mm nominal size) to be paid separately coated with thin layer of hot bitumen (blown type) @ 2.45 kg./ Sqm. including fixing blocks after dipping in hot bitumen (blown type) upto half depth planned, leveled, smooth and finished complete.	m	4918.00	

Item No.	Item	Unit	Rate	Remarks
1041	Providing and fixing ceramic glazed wall tiles conforming to IS : 15622 of approved make, colours, shades and size on wall and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with matching pigment complete.	m	525.00	
1042	Providing and laying ceramic glazed floor tiles 300x300mm conforming to IS : 15622 of approved make, colour, shade laid on 20 mm thick Cement Mortar 1:4 (1 cement : 4 coarse sand) including pointing the joints with white cement mixed with matching pigment etc., complete (in colour such as white ivory, grey, fume, redbrown)	sqm	648.00	
1043	Providing and laying ceramic glazed floor tiles 300x300mm conforming to IS : 15622 of approved make, colour, shade laid on 20 mm thick Cement Mortar 1:4 (1 cement : 4 coarse sand) including pointing the joints with white cement mixed with matching pigment etc., complete (in colour except white ivory, grey, fume, redbrown)	sqm	614.00	
1044	Providing and laying vitrified floor tiles with double charge/ multi charge printing with water absorption less than 0.5% and conforming to IS : 15622 of approved make in all colours and shades and size mentioned below (+/-10mm), laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc. complete, Size 600x600mm	sqm	929.00	
1045	Providing and laying vitrified floor tiles with double charge/ multi charge printing with water absorption less than 0.5% and conforming to IS : 15622 of approved make in all colours and shades and size mentioned below (+/-10mm), laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc. complete, Size 800x800mm	sqm	1268.00	

Item No.	Item	Unit	Rate	Remarks
1046	Providing and laying vitrified floor tiles with double charge/ multi charge printing with water absorption less than 0.5% and conforming to IS : 15622 of approved make in all colours and shades and size mentioned below (+/-10mm), laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc. complete, Size 1000x1000mm	sqm	1479.00	
1047	Providing & laying 60mm thick precast interlocking grass paver concrete blocks of approved size (approx 305 sqcm) and shape/ pattern, over 40 mm thick average complete coarse sand bed with joints of 3mm thick filled by fine sand including leveling with surface vibrator, temping and sweeping etc. complete of minimum compressive strength of 250 kg/sq.cm	sqm	590.00	

CHAPTER 11 – PLASTERING AND POINTING

Notes

1. Rates include – (a) Lead up to 100 m, for all materials for all items.
 - (b) Cost of all materials including water.
 - (c) All lifts for all items.
 - (d) Cost of mixing cement mortar.
 - (e) Cost of curing.
2. Rates are inclusive of raking of joints, preparation of surfaces, erection and removal of scaffolding, finishing, curing and cleaning.
3. Measurements: - (i) Dimension shall be measured correct to the nearest cm. The area shall be calculated in sqm correct to two Places of decimal.
 - (ii) Measurement of wall plastering shall be taken between walls or partitions (dimensions before plastering being taken) for length and from top of the floor or skirting to ceiling for height. Depth of cornices or cover, if any, shall be deducted.
 - (iii) Deductions :- For jambs , soffits, sills etc.; for openings not exceeding 0.5 sqm each in area, for ends of joists, beams, posts, girders, steps, etc., not exceeding 0.5 sqm in area; and for openings exceeding 0.5 sqm and not exceeding 3 sqm each, deductions and additions shall be made in the following manner :-
 - (a) No deduction shall be made for ends of joists, beams, posts, etc. and openings not exceeding 0.5 sqm each and no additions shall be made for reveals, jambs, soffits, sills, etc., of these openings nor for finish (finish to plaster) around ends of joists, beams, posts etc.
 - (b) Deductions for openings exceeding 0.5 sqm but not exceeding 3 sqm each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings.
 - (1) When both faces of wall plastered/pointed with same type of plaster / point, deduction shall be made for one face only.
 - (2) When two faces of wall are plaster/point with different types of plaster/point or if one face is plastered and the other pointed, deduction shall be made from the plaster or pointing on the side on which the width of reveal is less than that on the other side, but no deduction shall be made from plaster or pointing on the other side. Where widths are equal, deduction of 50 percent of area of opening on each face shall be made from areas of plastering and / or pointing as the case may be.
 - (3) When only one face is plastered and the other face is not plastered, full deduction shall be made from plaster if width of reveal on plastered side is less than that on unplastered side , but if widths of reveal on both sides are equal or width of reveal on plasterd side is

more, no deduction shall be made nor any addition shall be made for reveals, jambs, soffits, sills etc.

- (4) When width of door frame is equal to thickness of wall or is projecting beyond thickness of wall, full deduction for opening shall be made from each plastered face of the wall.
- (5) Plastering and pointing in C.M. 1:3 shall be done with prior written permission of the Superintending Engineer.
- (6) Thickness of plaster shall be exclusive of the thickness of key that is grooves or open joints in brick or stone work or space between laths. The minimum thickness over any portion of the surface shall not be less than specified thickness by more than 3mm.
- (7) Only 10 or 15mm thick plaster will be allowed for all thickness of brick walls except on one side of 20 cm brick wall where 20mm thick plaster, if actually done will be paid. Plaster more than 15 mm thick on brick work (except on one side of 20 mm thick brick wall) and more than 20 mm thick on stone work shall be done with prior written permission of the Chief Engineer/Superintending Engineer.
- (8) It is essential that mixes shall be used as soon as possible after water has been added and that following working periods recommended shall not be exceeded.
 - (a) Cement mortar - 30 minutes
 - (b) Cement lime mortar - 2 hours

After the finishing of the finishing coat, the plaster shall be kept wet for at least seven days.

Note: (1) Where two or three coat plasters are adopted as for as possible the mix for the under coats should contain coarse sand conforming to grading zone – II of I.S. 383-1970 and having fineness modulus not less than 2.0.

Note: (2) For single coat plaster the fineness modulus of sand should as for as possible 1.5 and conforming to grading zone – IV of I.S. 303-1970. Where only fine sand is available the fineness modulus of sand may be improved by mixing the required percentage of coarse sand. The strength of plaster mix gets reduced with the reduction in the fineness modulus of sand.

9. The following Indian Standards may be referred to:-

I.S. No.	Title
383-1970	Coarse and fine aggregate from natural sources of concrete (Second revision) (Reaffirmed 2007).
1661-1972	Code of practice for application of cement and cement – lime plaster finishes. (first revision) (Reaffirmed 2006)
2402-1963	Code of practice for external rendered finishes (Reaffirmed 2006)
2645-2003	Integral cement water proofing compound (first revision) (with amendment No.1
2750-1964	Steel scaffoldings (with amendments No.1 to 3) (Reaffirmed 2006)

3696(Pt.I)- 1987	Safety code for scaffolds and ladders : Part –1 Scaffolds. (Reaffirmed 2007)
8605-1977	Construction of masonry in dams. (Reaffirmed 1998)

Item No.	Item	Unit	Rate	Remarks
1101	20mm thick cement plaster on stone work in			
	(a) C.M. 1:3	sqm	138.00	
	(b) C.M. 1:4	sqm	123.00	
	(c) C.M. 1:6	sqm	106.00	
	(d) C.M. 1:8	sqm	98.00	
1102	25mm thick cement plaster on stone work in-			
	(a) C.M. 1:3	sqm	157.00	
	(b) C.M. 1:4	sqm	140.00	
	(c) C.M. 1:6	sqm	121.00	
	(d) C.M. 1:8	sqm	113.00	
1103	6mm thick cement plaster to ceiling in-			
	(a) C.M. 1:3	sqm	53.00	
	(b) C.M. 1:4	sqm	48.00	
1104	10mm thick cement plaster on brickwork in-			
	(a) C.M. 1:3	sqm	73.00	
	(b) C.M. 1:4	sqm	66.00	
	(c) C.M. 1:6	sqm	58.00	
	(d) C.M. 1:8	sqm	54.00	
1105	15mm thick cement plaster on brick work in-			
	(a) C.M. 1:3	sqm	97.00	
	(b) C.M. 1:4	sqm	86.00	
	(c) C.M. 1:6	sqm	74.00	
	(d) C.M. 1:8	sqm	68.00	
1106	20mm thick cement plaster on brickwork in			
	(a) C.M. 1:3	sqm	119.00	
	(b) C.M. 1:4	sqm	105.00	
	(c) C.M. 1:6	sqm	91.00	
	(d) C.M. 1:8	sqm	84.00	

Item No.	Item	Unit	Rate	Remarks
1107	Labour only for -			
	(a) Item 1101	sqm	69.00	
	(b) Item 1102	sqm	80.00	
	(c) Item 1103	sqm	33.00	
	(d) Item 1104	sqm	40.00	
	(e) Item 1105	sqm	47.00	
	(f) Item 1106	sqm	58.00	
1108	15 mm thick cement plaster 1:3 with water proofing compound (one packet of 1.6kg per bag of cement)	sqm	111.00	
1109	15mm thick rough cast cement plaster in			
	(a) C.M. 1:3	sqm	124.00	
	(b) C.M. 1:4	sqm	112.00	
	(c) C.M. 1:6	sqm	99.00	
1110	Labour only for item 1109	sqm	69.00	
1111	20 mm thick rough cast cement plaster in-			
	(a) C.M. 1:3	sqm	140.00	
	(b) C.M. 1:4	sqm	127.00	
	(c) C.M. 1:6	sqm	112.00	
1112	Labour only for 1111	sqm	80.00	
1113	1:3 cement plaster in bands (20mm thick) of-			
	(a) 10 to 20 cm width	m	23.00	
	(b) 20 to 30 cm width	m	38.00	
1114	1:4 cement plaster bands (20mm thick) of -			
	(a) 10 to 20 cm width	m	20.00	
	(b) 20 to 30 cm width	m	34.00	
1115	Labour only for items 1113(a) & 1114(a)	m	12.00	
1116	Labour only for item 1113 (b) & 1114 (b)	m	21.00	
1117	15mm thick cement plaster 1:3 with a floating coat of neat cement	Sqm	118.00	
1118	15mm thick cement plaster 1:4 with a floating coat of neat cement.	sqm	107.00	
1119	Labour only for item 1117 & 1118	sqm	58.00	

Item No.	Item	Unit	Rate	Remarks
1120	Pebble dash plaster on walls with a mixture of washed pebbles or crushed stone graded from 6mm to 12mm nominal size, dashed over and including fresh cement plaster 1:3 in two coats, backing coat 10mm and finishing coat 10mm thick including arises, chamfers etc. complete.	sqm	178.00	
1121	Labour only for item 1120	sqm	109.00	
1122	Pointing on brick work with cement mortar 1:3			
	(a) Flush pointing	sqm	58.00	
	(b) Ruled pointing	sqm	58.00	
	(c) Raised and cut pointing	sqm	74.00	
1123	Pointing on brick work with cement mortar 1:4			
	(a) Flush pointing	sqm	56.00	
	(b) Ruled pointing	sqm	56.00	
	(c) Raised and cut pointing	sqm	71.00	
1124	Pointing on brick work with cement mortar 1:6			
	(a) Flush pointing	sqm	54.00	
	(b) Ruled pointing	sqm	54.00	
	(c) Raised and cut pointing	sqm	67.00	
1125	Pointing on stone work with cement mortar 1:3			
	(a) Flush pointing	sqm	49.00	
	(b) Ruled pointing	sqm	52.00	
	(c) Raised and cut pointing	sqm	72.00	
1126	Pointing on stone work with cement mortar 1:4			
	(a) Flush pointing	sqm	47.00	
	(b) Ruled pointing	sqm	51.00	
	(c) Raised and cut pointing	sqm	69.00	
1127	Pointing on stone work with cement mortar 1:6			
	(a) Flush pointing	sqm	46.00	
	(b) Ruled pointing	sqm	49.00	
	(c) Raised and cut pointing	sqm	65.00	

Item No.	Item	Unit	Rate	Remarks
1128	Labour only for item 1122, 1123, and 1124, (a) Flush pointing	sqm	50.00	
	(b) Ruled pointing	sqm	50.00	
	(c) Raised and cut pointing	sqm	58.00	
1129	Labour only for item 1125, 1126, and 1127 (a) Flush pointing	sqm	43.00	
	(b) Ruled pointing	sqm	46.00	
	(c) Raised and cut pointing	sqm	50.00	
1130	Cement pointing in C.m. 1:3 to flag stone flooring.	sqm	28.00	
1131	Labour only for item 1130	sqm	21.00	
1132	Cost of water for curing only	One sqm of plaster or pointing	7.00	
1133	Labour only for curing	One sqm of plaster or pointing	9.00	
1134	Rough cast plaster upto 10 m height above GL ,18mm thick cement plaster in two coats with under layer of 12mm thick plaster 1:5 (1 cement : 5 fine sand) and top layer of 6mm thick with cement plaster 1:3 (1 cement : 3 fine sand) finished rough with sponge	sqm	363.00	
1135	Extra for water proofing material in proportion recommended by the manufactures	kg	30.00	
1136	Extra for plastering exterior walls of height more than 10 m from ground level for every additional height of 3 m or part thereof	Sqm	18.00	
1137	Extra for plastering on circular work not exceeding 6m in radius	Sqm	6.00	
1138	Extra for plastering done on moulding cornices or architraves i/c neat finish to line and level	Sqm	87.00	
1139	Providing and applying plaster of paris putty over plastered wall surface including scaffolding (a)Upto 2 mm thickness to make surface even and smooth in line and level.	Sqm	46.00	
	(b)More than 2 mm thickness to make surface even and smooth in true plumb and line and level	sqm	58.00	

CHAPTER 12 – WOOD WORK AND JOINERY

Notes:

1. Rates include – (a) Lead up to 100m for all materials unless otherwise specified.
(b) The cost of all spikes, nails, screws, glue etc. required for putting the work together and fixing the same.
(c) All lifts for all materials.
2. Lead shall be measured from the nearest market place or railway station or depot, whichever is nearer.
3. No lead is payable for fittings, fixtures, nails and screws for putting the work together and fixing the same.
4. Rates are for seasoned timber only.
5. Rates for glazed shutters for doors and windows are for transparent glass of 3mm thickness.
6. Seasoning and treatment – All timbers shall be kiln seasoned by a suitable process conforming to IS: 1141-1993 before being planed to the required sizes. Sapwood of durable species and heartwood and sapwood of non-durable species shall be treated with non-leachable type preservatives as specified in IS: 401-2001. The finished components shall also be given suitable treatment in places where there have been cut for joinery work.
7. Normally teakwood shall not be used for construction work, save of course, where use of teak is considered essential for this, prior written sanction of the Chief Engineer/ Superintending Engineer shall be necessary.
8. The items where more than one species of timber have been specified, the species of timber to be used shall be specifically mentioned while calling for tenders.
9. Built in fittings such as wardrobes, cupboards, shall be measured under appropriate item of joinery as follows:-
 - (a) The tops, backs, sides, divisions, and shelving's shall be measured as boarding's;
 - (b) The front shall be measured as doors; and
 - (c) The hanging and iron mongery shall be measured separately
10. The fittings shall be provided in accordance with schedule of fittings as given in Annexure A and B.
11. Measurements – (i) Length and width shall be measured to the nearest 0.01m. Width of single or detached planks shall, however, be measured to the nearest 2 mm . Thickness shall be measured to the nearest 2mm.

- (ii) Scantlings, battens, and baulks shall, however, be measured to the nearest 2mm in each cross-sectional dimension.
12. No work of teakwood shall be carried out without written permission of the Chief Engineer.

NOTE: Scantling means a piece of timber whose cross-sectional dimensions exceed 5cm but do not exceed 20cm in both directions, and batten means a piece of sawn timber whose cross sectional dimensions do not exceed 5 cm in either direction and baulk means a piece of sawn timber whose cross-sectional dimensions exceed 5 cm in one direction and 20 cm in other direction.

- (ii) Areas shall be worked out to the nearest .01 sqm
- (iii) Cubical contents shall be worked out to the nearest 0.001 cum.
- (iv) All work shall be measured net as fixed, that is, no extra measurement shall be made for shape, joints, etc., except in the following cases :-
- (a) Scantlings, battens, etc. in section other than rectangle from which section can be obtained;
- (b) In case of scantlings, battens, etc. with varying sections, largest section shall be measured;
- (c) Mitered pieces shall be measured along their longest length; and
- (d) Circular or segmental portions shall be measured net separately.
- (v) In measuring framed timber, length of tenons and scarf's shall be added to the site length of the framed member. Extra lengths where required to be embedded in walls/floors shall be added to site lengths.
- (vi) All liner louvers, such as rebates (straight or splayed) beads and chamfers shall not be measured for separately as the rates for relevant items provide for the same.
- (vii) Door and window shutters shall be paid for net measurement of shutter i.e. clear measuring in choukats after fixing.
13. The following Indian Standards may be referred to :-

I.S. No.	Title
110-1983	Ready mixed paint, brushing, grey filter, for enamels for use over primers (first revision)
204	Tower bolts
204(Pt.-I)-1991	Ferrous metals (fourth revision) (Reaffirmed 2006)
204(Pt.-II)-1992	Non ferrous metals (fourth revision) (with amendment No.1 and 2) (Reaffirmed 2001)
205-1992	Non-ferrous metal butt hinges (fourth revision) (Reaffirmed 2001)

I.S. No.	Title
206-1992	Tee and strap hinges (fourth revision) (Reaffirmed 2001)
207-1964	Gate and shutter hooks and eyes (revised)(with amendment No.1) (reaffirmed 2006).
208-1996	Door handles (fourth revision) (Reaffirmed 2001)
210-1983	Grey iron castings (fourth revision) (Reaffirmed 1999)
281-1991	mild steel sliding door bolts for use with padlocks (third revision) (Reaffirmed 2001)
287-1993	Recommendations for maximum permissible moisture content for timber used for different purpose (third revision) (Reaffirmed 2003)
303-1989	Plywood for general purposes (second revision) (Reaffirmed 2003)
318-1981	Leaded tin bronze ingots and castings (second revision) (Reaffirmed 2001)
362-1991	Parliament hinges (fifth revision) (Reaffirmed 2006)
363-1993	Hasps and staples (fourth revision) (Reaffirmed 1999)
364-1993	Fanlight catch (third revision) (Reaffirmed 1999)
401-2001	Code of practice for preservation of timber (fourth revision) (with amendment No.1) (Reaffirmed 2006)
419-1987	Putty, for use of window frames (first revision) (with amendment No.1) (reaffirmed 2002)
451-1992	Technical supply conditions for wood screws (third revision)
452-1973	Door springs, rat-tail type (second revision) (Reaffirmed 2006)
453-1993	Double acting spring hinges (third revision) (Reaffirmed 1999)
707-1976	Glossary of terms applicable to timber technology & utilisation (second revision) (Reaffirmed 2005)
723-1972	Steel counter sunk head wire nails (second revision) (with amendments No. 1 to 3) (Reaffirmed 2006)
729-1979	Drawer locks, cupboard locks and box locks (third revision) (Reaffirmed 2006)
737-1986	Wrought aluminum and aluminum alloy sheet and strip for general engineering purposes (third revision) (Reaffirmed 2006)
848-1974	Synthetic resin adhesives for plywood (phenolic and aminoplastic) (second revision)
851-1978	Synthetic resin adhesives for construction work (non-structural) in wood (first revision) (Reaffirmed 2005)
852-1994	Animal glue for general wood working purposes (first revision) (with amendment No.1) (Reaffirmed 1999)
1003 (Part I & Part II 2003)	Timber paneled and glazed shutters. (fourth revision) (Reaffirmed 2006)
1019-1974	Rim latches (second revision) (with amendment No.1) (Reaffirmed 2000)
1068-1993	Electroplated coating of nickel plus chromium and copper plus nickel plus chromium on iron and steels (second revision) (Reaffirmed 2006)

I.S. No.	Title
1141-1993	Code of practice for seasoning for timber (first revision) (with amendment No.1 and 2)
1328-1996	Veneered decorative plywood (second revision) (with amendment No.1 and 20) (reaffirmed-2002)
1341-1992	Steel butt hinges (sixth revision) (Reaffirmed 2001)
1378-1987	Oxidized copper finishes (third revision) (Reaffirmed 2006)
1658-2006	Fiber hard boards (third revision)
1659-2004	Block boards (second revision) (with amendment No.1)
1708-1986	Methods of testing of small clear specimen of timber (second revision) (with amendment No.1) (Reaffirmed 2005)
1734(Pt.1)-1983	Method of test of plywood part-I determination of density and moisture content (second revision) (reaffirmed 2003)
1812-1982	Carbon steel wire for the manufactures of wood screw (second revision) (reaffirmed-2001)
1823-1980	Specification for floor door stopper (third revision) (reaffirmed-2001)
1826-1961	Venetian binds for windows (with amendment No.1) (Reaffirmed 2001)
1868-1996	Anodic coatings on aluminum (third revision) (Reaffirmed 2006)
2062-1999	Weld able structural steel (third revision) (reaffirmed-1987)
2191(Pt.1)-1983	Wooden flush shutters (cellular and hollow core type) part-I Plywood face panels (fourth revision) (Reaffirmed 2006)
2191(PtII)-1983	Wooden flush door shutters (cellular and hollow core type) part-II Particle board and hardboard face panels (fourth revision)
2202(Pt.1)-1999	Wooden flush door shutter (solid core type) part-I Plywood face panels (sixth revision)
2202(Pt.II)-1983	Wooden flush door shutter (solid core type) part-II Particle board and hardboard face panels. (Reaffirmed 2006)
2209-1976	Mortice locks (vertical type) (third revision) (reaffirmed 2006)
2380(Pt.1XXIII)-1981	Methods of test for wood particle boards and board from other lignocelluloses materials (reaffirmed-1989)
2525-1982	Dimensions for wrought aluminum & aluminum alloy (first revision)
2681-1993	Non-ferrous metal sliding door bolts (Aldrops for the use with padlocks) (third revision) (Reaffirmed 2003)
2835-1987	Flat transparent sheet glass (third revision) (Reaffirmed 1998)
2931-1964	Ready mixed paint, brushing, and aluminum-zinc oxide composite primer.
2932-2003	Enamel, synthetic, exterior (a) under coating (b) finishing (third revision)
2933-1975	Enamel, exterior(a) under coating(b) finishing (second revision) (amendment No.2 April 1982) (reaffirmed 2001)
3087-2005	Wood particle boards (medium density) for general purposes (second revision) (with amendments No.1)
3097-2006	Veneered particle board (second revision)
3337-1978	Ballies for general purpose (first revision)(reaffirmed 2006)

I.S. No.	Title
3548-1988	Code of practice for glazing in buildings (first revision)
3564-1996	Door closer (hydraulically regulated) (fourth revision)
3618-1986	Phosphate treatment of iron and steel for protection against corrosion (Reaffirmed 2002).
3813-1987	'C' hooks for use with swivels. (reaffirmed 1993)
3818-1992	Continuous (Piano) hinges (third revision) (Reaffirmed 2001)
3847-1992	Mortice night latches (reaffirmed 2006)
3965-1981	Dimension for wrought aluminum & aluminum alloy bar, rod & section (first revision) (reaffirmed 2006)
4021-1995	Timber door, windows and ventilator frames (third revision) (with amendment No.1) (reaffirmed 2000)
4082-1996	Recommendations on stacking and storage of construction materials at site (second revision) (reaffirmed 2003)
4170-1967	Brass rod for general engineering purpose (with amendment No.1) (reaffirmed 2006)
4413-1981	Brass wires for general engineering purpose (first revision) (reaffirmed 2006)
4827-1983	Electroplated coatings of nickel and chromium on copper and copper alloys (first revision)
4835-1979	Polyvinyl acetate dispersion-base adhesive for wood (first revision) (reaffirmed 2005)
4962-1968	Wooden side sliding doors. (reaffirmed 2001)
4992-1975	Door handles for mortice locks (vertical type) (first revision) (reaffirmed 2006)
5187-1972	Flush bolts (first revision) (with amendment No.1) (reaffirmed 2006)
5930-1970	Mortice latch (vertical type) (with amendment No.1) (reaffirmed 2000)
6198-1992	Legged, braced and battened timber door shutter (first revision) (with amendment No.1) (reaffirmed 2006)
6318-1971	Plastic window stays and fasteners (reaffirmed 2005)
6607-1972	Rebated mortice locks (vertical type) (with amendment No.1) (reaffirmed 2006)
6760-1972	Slotted countersunk head wood screws (reaffirmed 1999)
7196-1974	Hold fasts (reaffirmed 2001)
7197-1974	Double action floor springs (without oil check) for heavy doors. (reaffirmed 2000)
8760-1978	Mortice sliding door locks with lever mechanism (reaffirmed 2006)
10019-1981	Steel window stays and fasteners (reaffirmed 2001)

Item No.	Item	Unit	Rate	Remarks
1201	Sawn teakwood framed and fixed in position.	cum	92959.00	
1202	Sawn, sal, bija, haldu, kem or hollock wood wrought framed and fixed complete in position.	cum	51183.00	
1203	Sawn satkata wood wrought framed and fixed complete in position.	cum	42708.00	
1204	Labour only for items 1201 to 1203	cum	3158.00	
1205	120 to 150mm dia, teakwood ballies including dressing and fixing complete	m	330.00	
1206	120mm to 150mm dia sal or bija wood ballies including dressing and fixing complete.	m	159.00	
1207	Labour only for items 1205 and 1206	m	22.00	
1208	100mm to 119mm dia teak wood ballies including dressing and fixing complete	m	176.00	
1209	100mm to 119mm dia sal or bija wood ballies including dressing and fixing complete.	m	140.00	
1210	Labour only for item 1208 and 1209	m	19.00	
1211	75 mm to 90mm dia teakwood ballies including dressing and fixing complete.	m	150.00	
1212	75 mm to 90-mm dia sal or bija wood ballies including dressing and fixing complete.	m	97.00	
1213	75mm to 90mm dia satkata wood ballies including dressing and fixing complete	m	83.00	
1214	Labour only for items 1211 to 1213	m	16.00	
1215	Deduct for undressed ballies from items, 1205 to 1214	m	10.00	
1216	15mm thick teakwood finished planks, fitted and fixed complete.	sqm	1731.00	
1217	15mm thick sal, bija, haldu, kem or hollock wood finished planks, fitted and fixed complete.	sqm	867.00	
1218	20mm thick teak wood finished planks, fitted and fixed complete	sqm	2183.00	
1219	20mm thick sal, bija, haldu, kem or hollock wood finished planks, fitted and fixed complete.	sqm	1097.00	
1220	20mm thick satkata wood finished planks, fitted and fixed complete.	sqm	1014.00	

Item No.	Item	Unit	Rate	Remarks
1221	25mm thick teakwood finished planks, fitted and fixed complete.	sqm	2707.00	
1222	25mm thick sal, bija, haldu, kem or hollock wood finished planks, fitted and fixed complete.	sqm	1349.00	
1223	25mm thick satkata wood finished planks, fitted and fixed complete.	sqm	1245.00	
1224	30mm thick teak wood finished planks, fitted and fixed complete	sqm	3231.00	
1225	30mm thick sal, bija, haldu, kem or hollock wood finished planks fitted and fixed complete.	sqm	1601.00	
1226	30mm thick satkata wood finished planks, fitted and fixed complete.	sqm	1476.00	
1227	40mm thick teak wood finished planks, fitted and fixed complete.	sqm	4279.00	
1228	40mm thick sal, bija, haldu, kem or hollock wood finished planks, fitted and fixed complete.	sqm	2105.00	
1229	40mm thick satkata wood finished planks, fitted and fixed complete.	sqm	1939.00	
1230	(a) Labour only for teak, sal, bija haldu, kem, hollock or stakata wood planks finished fitted and fixed complete.	sqm	88.00	
	(b) Deduct from item 1216 to 1230 for planks not fitted and fixed.	sqm	44.00	
1231	20 mm thick teak wood battened shutters (with iron hinges, cleats and door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	3021.00	
1232	20mm thick bija, haldu or hollock wood battened shutters (with iron hinges, cleat, door stoppers, or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	1744.00	
1233	25mm thick teak wood battened shutters (with iron hinges, cleats door stoppers, or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	3522.00	

Item No.	Item	Unit	Rate	Remarks
1234	25mm thick bija, haldu or hollock wood battened shutters, (with iron, hinges, cleats, door stoppers or eyes and hooks, aldrops, lower bolts and handles) fixed in position complete but excluding other fittings.	sqm	2124.00	
1235	30mm thick teak wood battened shutters (with iron hinges, cleats door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings .	sqm	4438.00	
1236	30 mm thick bija, haldu or hollock wood battened shutters (with iron hinges cleats, door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	2446.00	
1237	40mm thick teak wood battened shutters (with iron hinges , cleats, door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	5932.00	
1238	40mm thick bija, haldu or hollock wood battened shutters (with iron hinges, cleats, door stopper or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings	sqm	3189.00	
1239	Labour only for battened shutters including fixing in position.	sqm	415.00	
1240	25mm thick teakwood fully paneled shutters (with iron hinges, cleats, door stoppers or eyes and hooks, aldrops tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	3547.00	
1241	25mm thick bija, haldu or hollock wood fully paneled shutters (with iron hinges, cleats, door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	2291.00	
1242	30mm thick teak wood fully paneled shutters complete (with iron hinges, cleats, door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	4150.00	

Item No.	Item	Unit	Rate	Remarks
1243	30mm thick bija, haldu or hollock wood fully paneled shutters (with iron hinges , cleats, door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	2614.00	
1244	40mm thick teak wood fully paneled shutters (with iron hinges, cleats, door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	5039.00	
1245	40mm thick bija, haldu or hollock wood fully paneled shutters (with iron hinges, cleats, door stoppers or eyes and hooks, aldorps, tower bolts and handles) fixed in position complete but excluding other fittings.	sqm	3089.00	
1246	Labour only for fully paneled shutters including fixing in position	sqm	727.00	
1247	25mm thick teak wood shutters (with iron higes, stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings -			
	(i) 2/3 paneled 1/3 glazed	sqm	3228.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	2766.00	
	(iii) ½ paneled and ½ glazed	sqm	2997.00	
	(iv) Fully glazed	sqm	2266.00	
1248	30mm thick teak wood shutters (with iron hinges, cleats, door stoppers or eyes and hooks, aldrops, tower bolts and hanles) fixed in position complete but excluding other fittings -			
	(i) 2/3 paneled 1/3 glazed	sqm	3743.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	3166.00	
	(iii) ½ paneled and ½ glazed	sqm	3455.00	
	(iv) Fully glazed	sqm	2531.00	
1249	40mm thick teak wood shutters (with iron hinges, cleats door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings -			
	(i) 2/3 paneled 1/3 glazed	sqm	4441.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	3839.00	

Item No.	Item	Unit	Rate	Remarks
	(iii) ½ paneled and ½ glazed	sqm	4140.00	
	(iv) Fully glazed	sqm	3061.00	
1250	25mm thick bija, haldu or hollock wood shutters (with iron hinges, cleats door stoppers or eyes and hooks, aldrops, tower bolts and handles) fixed in position complete but excluding other fittings -			
	(i) 2/3 paneled 1/3 glazed	sqm	2138.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	1895.00	
	(iii) ½ paneled and ½ glazed	sqm	2016.00	
	(iv) Fully glazed	sqm	1649.00	
1251	30mm thick bija, haldu or hollock wood (with iron hinges, cleats, door stoppers or eyes and hooks, aldorps, tower bolts and handles) fixed in position complete but excluding other fittings.			
	(i) 2/3 paneled 1/3 glazed	sqm	2413.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	2109.00	
	(iii) ½ paneled and ½ glazed	sqm	2261.00	
	(iv) Fully glazed	sqm	1791.00	
1252	40mm thick bija, haldu or hollock wood (with iron hinges, cleats, door stoppers or eyes and hooks, aldorps, tower bolts and handles) fixed in position complete but excluding other fittings.			
	(i) 2/3 paneled 1/3 glazed	sqm	2784.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	2466.00	
	(iii) ½ paneled and ½ glazed	sqm	2625.00	
	(iv) Fully glazed	sqm	2075.00	
1253	Labour only for items 1247 to 1252 including fixing in position-			
	(i) 2/3 paneled 1/3 glazed	sqm	701.00	
	(ii) 1/3 paneled 2/3 glazed	sqm	649.00	
	(iii) ½ paneled and ½ glazed	sqm	675.00	
	(iv) Fully glazed	sqm	549.00	
1254	Providing and fixing plain glass panes 3mm thick to doors and windows	sqm	442.00	

Item No.	Item	Unit	Rate	Remarks
1255	Extra rate over item 1254 for providing and fixing frosted or ground glass panes 3 mm thick	sqm	113.00	
1256	Labour only for item 1254 and 1255	sqm	61.00	
1257	Teak wood wire gauge shutters using galvanised M.S.. wire gauge of IS gauge designation 85 G with wire of dia 0.56 mm (with iron fittings, cleats, door stoppers or eyes and hooks including spring hinges, tower bolts and handles) fixed in position complete but excluding other fittings			
	(i) 25mm thick	sqm	2251.00	
	(ii) 30mm thick	sqm	2885.00	
	(iii) 40mm thick	sqm	3523.00	
1258	Bija, haldu, hollock wood wire gauge shutters using galvanised M.S.. wire gauge of IS gauge designation 85 G with wire of dia 0.56 mm (with iron fittings, cleats, door stoppers or eyes and hooks, including spring hinges, tower bolts and handles fixed in position but excluding other fittings-			
	(i) 25mm thick	sqm	1810.00	
	(ii) 30mm thick	sqm	1995.00	
	(iii) 40mm thick	sqm	2336.00	
1259	Labour only for items 1257 and 1258	sqm	587.00	
1260	If iron fittings are supplied separately deduct from items 1231 to 1138	sqm	102.00	
1261	If iron fittings are supplied separately, deduct from items 1240 to 1245 and 1247 to 1252	sqm	121.00	
1262	Providing and fixing in position (solid core type) flush door, single leaf shutters bounded with thermosetting liquid phenol formaldehyde , synthetic resin (with iron hinges, cleats, door stoppers or eyes and hooks) fixed in position complete but excluding other fittings-			
	(A) 25mm thick shutters			
	(i) commercial on both side	sqm	2129.00	
	(ii) commercial on one side and teak decorative on other side	sqm	2841.00	
	(iii) Teak decorative on both sides	sqm	3475.00	

Item No.	Item	Unit	Rate	Remarks
	(B) 30mm thick shutters			
	(i) Commercial on both sides	sqm	2247.00	
	(ii) commercial on one side and teak decorative on other side	sqm	2900.00	
	(iii) Teak decorative on both sides	sqm	3671.00	
	(c) 40mm thick shutters			
	(i) Commercial on both sides	sqm	2378.00	
	(ii) commercial on one side and teak decorative on other side	sqm	3090.00	
	(iii) Teak decorative on both sides	sqm	3820.00	
1263	Providing and fixing in position (solid core type) flush door, double leaf shutters bounded with thermosetting liquid phenol formaldehyde synthetic resin (with iron hinges, cleats, door stoppers or eyes and hooks) fixed in position complete but excluding other fittings:-			
	(A) 25mm thick shutters			
	(i) commercial on both side	sqm	2156.00	
	(ii) commercial on one side and teak decorative on other side	sqm	2868.00	
	(iii) Teak decorative on both sides	sqm	3503.00	
	(B) 30mm thick shutters			
	(i) Commercial on both sides	sqm	2275.00	
	(ii) commercial on one side and teak decorative on other side	sqm	2927.00	
	(iii) Teak decorative on both sides	sqm	3698.00	
	(c) 40mm thick shutters			
	(i) Commercial on both sides	sqm	2405.00	
	(ii) commercial on one side and teak decorative on other side	sqm	3117.00	
	(iii) Teak decorative on both sides	sqm	3847.00	
1264	Labour only for fixing in position flush shutters for item 1262	sqm	163.00	
1265	Labour only for fixing in position flush shutters for item 1263	sqm	163.00	

Item No.	Item	Unit	Rate	Remarks
1266	Providing and fixing 25 mm x 12mm thick teak wood battens double jafree with 50mm clear spacing complete (frame to be paid separately)	sqm	1287.00	
1267	Providing and fixing 25mm x 12mm thick bija haldu or hollock wood battens double jafree with 50mm clear spacing complete (frame to be paid separately).	sqm	746.00	
1268	Providing and fixing 50mm x 12mm thick teak wood battens double jafree with 50mm clear spacing complete (frame to be paid separately)	sqm	1831.00	
1269	Providing and fixing 50mmx12mm thick bija, haldu or hollock battens double jafree 50mm clear spacing complete (frame to be paid separately).	sqm	1209.00	
1270	Labour only for item 1266 to 1269	sqm	108.00	
1271	Providing and fixing 40mm to 50mm dia bamboos, half split double jafree with clear distance of 50mm complete (frame to be paid Separately)	sqm	134.00	
1272	Labour only for item 1271	sqm	54.00	
1273	Providing and fixing 5 mm thick north light glazing panes wired glass (IS:5437) including all fixtures, rubber packing, clamping accessories etc. complete (any height).	sqm	974.00	
1274	Providing and fixing 6mm thick north light glazing panes wired glass (IS:5437) including all fixtures, rubber packing, clamping, accessories etc, complete (any height)	sqm	1458.00	
1275	Labour only for items 1273 and 1274	sqm	66.00	
1276	Providing and fixing 12mm thick teak wood louvers of 80mm clear spacing to window or ventilator frames fixed at an angle of 45° including making grooves and fixing with teakwood beading etc., complete	sqm	1624.00	
1277	Providing and fixing 3mm thick plain glass louvers on 80mm clear spacing to window or ventilator frames, fixed at an angle of 45° including making grooves and fixing with teak wood beading etc., complete.	sqm	553.00	

Item No.	Item	Unit	Rate	Remarks
1278	Providing and fixing 3mm thick frosted glass louvers on 80mm clear spacing to window or ventilator frames, fixed at an angle of 45 ⁰ including making grooves and fixing with teak wood beading etc. complete.	sqm	598.00	
1279	Labour only for items 1276 to 1278	sqm	95.00	
1280	Providing and fixing window bars in position	kg	43.00	
1281	Labour only for cutting and fixing window bars in position.	kg	6.00	
1282	Providing and fixing nuts and washers to window bars including treading bars 25mm length on either side including cost of nuts.	each bar	16.00	
1283	Sawing charges for converting wooden sleepers or logs into planks and scantlings etc. -			
	(i) Soft wood	sqm	9.00	
	(ii) Hard wood	sqm	13.00	
1284	MILD STEEL FITTINGS			
	(i) Providing and fixing M.S. pressed but hinges bright finished with necessary screws etc., complete -			
	(a) 125x65x2.12mm	each	36.00	
	(b) 100x58x1.90mm	each	29.00	
	(c) 75x47x1.70mm	each	24.00	
	(d) 50x37x1.50mm	each	18.00	
	(ii) Providing and fixing M.S. single acting spring hinges bright finished with necessary screws etc. complete -			
	(a) 150mm	each	231.00	
	(b) 125mm	each	207.00	
	(c) 100mm	each	182.00	
	(iii) Providing and fixing M.S. double acting spring hinges bright finished with necessary screws etc. complete			
	(a) 150mm	each	373.00	
	(b) 125mm	each	314.00	
	(c) 100mm	each	253.00	

Item No.	Item	Unit	Rate	Remarks
	(iv) Providing 1 mm thick M.S. piano hinges finished with brass plating flange being 35 mm wide and fixing with necessary screws etc., complete.	each	195.00	
	(v) Providing and fixing M.S. Tee hinges bright finished or/and black enameled with necessary screws etc. complete-			
	(a) 300x115x2.24 mm	each	48.00	
	(b) 250x100x2.24 mm	each	42.00	
	(vi) Providing and fixing M.S. sliding door bolts bright finished or / and black enameled with nuts and screws etc. complete-			
	(a) 300x16mm	each	75.00	
	(b) 250x16mm	each	66.00	
	(vii) Providing and fixing M.S. tower bolts (barrel Type) with necessary screws etc. complete -			
	(a) 250x10 mm	each	32.00	
	(b) 200x10 mm	each	30.00	
	(c) 150x10 mm	each	27.00	
	(d) 100x10mm	each	24.00	
	(viii) Providing and fixing 85x42 mm mils steel bright polished nickel plated pull bolt lock with necessary nut and screws etc. complete.	each	181.00	
	(ix) Providing and fixing M.S. door latch with screws etc, complete			
	(a) 300x20x6 mm	each	50.00	
	(b) 250x20x6 mm	each	44.00	
	(x) Providing and fixing M.S. handles with necessary screws. Etc., complete-			
	(a) 125mm	each	13.00	
	(b) 100mm	each	11.00	
	(c) 75mm	each	9.00	
	(xi) Providing and fixing M.S. hooks and eyes			
	(a) 300 mm	each	19.00	
	(b) 250 mm	each	17.00	

Item No.	Item	Unit	Rate	Remarks
	(c) 200 mm	each	15.00	
	(d) 150 mm	each	10.00	
	(e) 100 mm	each	9.00	
	(xii) Providing and fixing M.S. fanlight pivots with necessary screws.	each	12.00	
	(xiii) Providing and fixing M.S. fanlight catch with necessary screws.	each	13.00	
	(xiv) Providing and fixing 300mm long M.S. chain with hooks for fanlight including necessary screws etc., complete.	each	15.00	
1285	BRASS FITTINGS			
	(i) Providing and fixing bright finished brass butt hinges with necessary screws, etc., complete -			
	(a) 125x85x5.5 mm (heavy type)	each	342.00	
	(b) 125x70x4 mm (ordinary type)	each	140.00	
	(c) 100x85x5.5mm (heavy type)	each	253.00	
	(d) 75x65x4mm (ordinary type)	each	110.00	
	(e) 75x65x4mm (heavy type)	each	122.00	
	(f) 75x40x2.5 mm (ordinary type)	each	63.00	
	(g) 50x40x2.5 mm (ordinary type)	each	45.00	
	(ii) Providing and fixing bright finished brass single acting spring hinges with necessary screws, etc., complete -			
	(a) 150mm	each	578.00	
	(b) 125mm	each	507.00	
	(c) 100mm	each	341.00	
	(iii) Providing and fixing bright finished brass double acting spring hinges with necessary screws , etc. complete -			
	(a) 150 mm	each	910.00	
	(b) 125 mm	each	756.00	
	(c) 100 mm	each	531.00	
	(iv) Providing and fixing bright finished sliding door bolts with nuts and screws, etc., complete -			
	(a) 300x16mm	each	385.00	
	(b) 250x16mm	each	397.00	

Item No.	Item	Unit	Rate	Remarks
	(v) Providing and fixing bright finished brass tower bolts (barrel type) with screws, etc. complete-			
	(a) 250 x 10 mm	each	180.00	
	(b) 200 x 10 mm	each	156.00	
	(c) 150 x 10 mm	each	144.00	
	(d) 100 x 10 mm	each	108.00	
	(vi) Providing and fixing bright finished brass door latch with necessary screws, etc. complete -			
	(a) 300x16x5 mm	each	168.00	
	(b) 250x16x5 mm	each	150.00	
	(vii) Providing and fixing special quality bright finished brass cup board or ward robe locks with six levers including necessary screws, etc., complete (best make of approved quality)-			
	(a) 40 mm	each	119.00	
	(b) 50 mm	each	125.00	
	(c) 65 mm	each	136.00	
	(d) 75 mm	each	166.00	
	(viii) Providing and fixing bright finished brass handles with screws, etc. complete -			
	(a) 125mm	each	108.00	
	(b) 100mm	each	90.00	
	(c) 75mm	each	84.00	
	(ix) Providing and fixing 150-mm bright finished floor brass door stoppers with rubber cushion, screws, etc. complete to suit shutter thickness.	each	143.00	
	(x) Providing and fixing bright finished brass hydraulic door closer (Best make of approved quality) with necessary accessory screws, etc. complete -	each	1176.00	
	(xi) Providing and fixing bright finished brass hard drawn hook and eyes -			
	(a) 300mm	each	143.00	
	(b) 250mm	each	114.00	
	(c) 200mm	each	119.00	

Item No.	Item	Unit	Rate	Remarks
	(d) 150mm	each	108.00	
	(e) 100mm	each	72.00	
	(xii) Providing and fixing bright finished brass fan light pivot with necessary screws etc., complete	each	39.00	
	(xiii) Providing and fixing bright finished brass fan light catch with necessary screws etc., complete	each	32.00	
	(xiv) Providing and fixing 300mm long bright finished brass chain with hook for fanlight including necessary screws etc., complete.	each	44.00	
1286	COPPER OXIDISED BRASS FITINGS-			
	(i) Providing and fixing copper oxidised brass but hinges with necessary screws etc. complete -			
	(a) 125x85x5.5mm (heavy type)	each	350.00	
	(b) 125x70x4mm (ordinary type)	each	159.00	
	(c) 100x85x5.5mm (heavy type)	each	248.00	
	(d) 100x70x4mm (ordinary type)	each	129.00	
	(e) 75x65x4mm (heavy type)	each	122.00	
	(f) 75x40x2.5mm (ordinary type)	each	81.00	
	(g) 50x40x2.5mm (ordinary type)	each	62.00	
	(ii) Providing and fixing copper oxidised brass single etc, complete			
	(a) 150 mm	each	549.00	
	(b) 125 mm	each	513.00	
	(c) 100 mm	each	377.00	
	(iii) Providing and fixing copper oxidised brass double acting spring hinges with necessary screws etc complete-			
	(a) 150mm	each	917.00	
	(b) 125mm	each	739.00	
	(c) 100mm	each	554.00	
	(iv) Providing and fixing copper oxidised brass sliding door bolt with necessary nuts and screws, etc. complete -			
	(a) 300x16mm	each	468.00	
	(b) 250x16mm	each	445.00	

Item No.	Item	Unit	Rate	Remarks
	(v) Providing and fixing copper oxidised brass tower bolts (barrel type) with necessary screws etc. complete -			
	(a) 250x10 mm	each	206.00	
	(b) 200x10 mm	each	203.00	
	(c) 150x10 mm	each	147.00	
	(d) 100x10 mm	each	117.00	
	(vi) Providing and fixing copper oxidised brass 100mm mortice latch and lock with six levers and a pair of lever handles, necessary screws, etc. complete (best make of approved quality)	each	602.00	
	(vii) providing and fixing copper oxidised brass door latch with necessary screws, etc., complete -			
	(a) 300x16x5 mm	each	193.00	
	(b) 250x16x5 mm	each	181.00	
	(viii) Providing and fixing copper oxidised brass night latch including necessary screws etc., complete (best make of approved quality).	each	777.00	
	(ix) Providing and fixing 65x35mm special quality copper oxidised brass cupboard lock with six levers including necessary screws, etc., complete (best make of approved quality) .	each	160.00	
	(x) Providing and fixing copper oxidised brass handles with necessary screws, etc., complete -			
	(a) 125 mm	each	149.00	
	(b) 100 mm	each	143.00	
	(c) 75 mm	each	114.00	
	(xi) Providing and fixing 150mm copper oxidised brass floor door stopper, with rubber cushion, screws etc., to suit shutter thickness complete .	each	186.00	
	(xii) Providing and fixing copper oxidised brass hard drawn hook and eyes			
	(a) 300 mm	each	143.00	
	(b) 250 mm	each	119.00	

Item No.	Item	Unit	Rate	Remarks
	(c) 200 mm	each	108.00	
	(d) 150 mm	each	90.00	
	(e) 100 mm	each	84.00	
	(xiii) Providing and fixing copper oxidised brass fan light pivot with necessary screws etc. complete.	each	47.00	
	(xiv) Providing and fixing copper oxidised brass fan light catch with necessary screws etc., complete.	each	31.00	
	(xv) Providing and fixing 300mm long copper oxidised brass chain with hook for fan light including necessary screws etc. complete.	each	55.00	
1287	CHROMIUM PLATED BRASS FITTING			
	(i) Providing and fixing chromium plated brass butt hinges with necessary screws etc. complete-			
	(a) 125x85x5.5 mm (heavy type)	each	368.00	
	(b) 125x70x4mm (ordinary type)	each	160.00	
	(c) 100x85x5.5 mm (heavy type)	each	237.00	
	(d) 100x70x4mm (ordinary type)	each	119.00	
	(e) 75x65x4 mm (heavy type)	each	102.00	
	(f) 75x40x2.5mm (ordinary type)	each	84.00	
	(g) 50x40x2.5mm (ordinary type)	each	43.00	
	(ii) Providing and fixing chromium plated brass single acting spring hinges with necessary screws etc. complete -			
	(a) 150 mm	each	575.00	
	(b) 125 mm	each	533.00	
	(c) 100 mm	each	391.00	
	(iii) Providing and fixing chromium plated double, acting spring hinges with necessary screws etc., complete			
	(a) 150 mm	each	919.00	
	(b) 125 mm	each	741.00	
	(c) 100 mm	each	557.00	
	(iv) Providing and fixing chromium plated brass sliding door bolt with nuts and screws etc. complete -			

Item No.	Item	Unit	Rate	Remarks
	(a) 300x16 mm	each	468.00	
	(b) 250x16mm	each	439.00	
	(v) Providing and fixing chromium plated brass bolts (barrel type) with necessary screws etc. complete			
	(a) 250x10mm	each	217.00	
	(b) 200x10mm	each	202.00	
	(c) 150x10mm	each	158.00	
	(d) 100x10mm	each	116.00	
	(vi) Providing and fixing 85 mm x 42 mm chromium plated brass pull bolt lock with necessary screws, nuts, bolts and washers etc. complete -	each	342.00	
	(vii) Providing and fixing chromium plated brass door latch with screws etc. complete-			
	(a)300 x 16 x 5 mm	each	192.00	
	(b)250 x 165 x 5 mm	each	174.00	
	(viii) Providing and fixing chromium plated brass 100mm mortice latch and lock with 6 levers and a pair of lever handles with necessary screws etc. complete (best make of approved quality).	each	570.00	
	(ix) Providing and fixing chromium plated brass night latch including necessary screws etc. complete (best make of approved quality)	each	712.00	
	(x) Providing and fixing chromium plated brass handles with necessary screws etc., complete -			
	(a) 125 mm	each	149.00	
	(b) 100 mm	each	131.00	
	(c) 75 mm	each	113.00	
	(xi) Providing and fixing chromium plated brass floor door stopper with rubber cushion, screws each etc. complete to suit shutter thickness.	each	253.00	
	(xii) Providing and fixing chromium plated brass hard drawn hooks and eyes -			
	(a) 300 mm	each	149.00	
	(b) 250 mm	each	137.00	

Item No.	Item	Unit	Rate	Remarks
	(c) 200 mm	each	108.00	
	(d) 150 mm	each	90.00	
	(e) 100 mm	each	72.00	
	(xiii) Providing and fixing chromium plated brass fan light pivot with necessary screws etc. complete	each	48.00	
	(xiv) Providing and fixing chromium plated brass fan light catch with necessary screws etc. complete.	each	66.00	
	(xv) Providing and fixing 300mm long chromium plated brass chain with hook for fan light including necessary screws etc. complete.	each	48.00	
	(xvi) Providing and fixing chromium plated brass quadrant stays 300mm long with necessary screws etc. complete	each	114.00	
1288	ANODISED ALUMINUM FITTINGS			
	(i) Providing and fixing aluminum butt hinges anodised transparent or dyed to required colour or shade with necessary screws etc., completed-			
	(a) 125x75x4 mm	each	128.00	
	(b) 125x63x4 mm	each	116.00	
	(c) 100x75x4 mm	each	107.00	
	(d) 100x63x4 mm	each	101.00	
	(e) 100x63x3.2 mm	each	95.00	
	(f) 75x63x4 mm	each	89.00	
	(g) 75x63x3.2 mm	each	86.00	
	(h) 75x45x3.20 mm	each	62.00	
	(i) 50x45x3.2 mm	each	41.00	
	(ii) Providing and fixing aluminum sliding door bolts anodised transparent or dyed to required colour or shade with nuts and screws etc., complete-			
	(a) 300x16 mm	each	332.00	
	(b) 250x16 mm	each	326.00	

Item No.	Item	Unit	Rate	Remarks
	(iii) Providing and fixing aluminum tower bolts anodised transparent or dyed to required colour or shade with necessary screws etc., complete-			
	(a) 300x10 mm	each	144.00	
	(b) 250x10 mm	each	126.00	
	(c) 200x10 mm	each	108.00	
	(d) 150x10 mm	each	90.00	
	(e) 100x100 mm	each	59.00	
	(iv) Providing and fixing aluminum pull bolt lock anodised transparent or dyed to required colour and shade with necessary screws etc. complete-	each	87.00	
	(v) Providing and fixing aluminum handles anodised transparent or dyed to required colour or shade with necessary screws etc., complete-			
	(a) 125 mm	each	63.00	
	(b) 100 mm	each	57.00	
	(c) 75 mm	each	63.00	
	(vi) Providing and fixing aluminum, hanging floor to required colour or shade with necessary screws etc., complete-	each	29.00	
	(vii) Providing and fixing aluminum casement stays anodised transparent or dyed to required colour or shade with necessary screws etc., complete-	each	123.00	
	(viii) Providing and fixing bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of anodised aluminum lever handles with necessary screws etc., complete. (Best make of approved quality).	each	653.00	
1289	OXIDISED MILD STEEL FITINGS:			
	(I) Providing and fixing oxidised M.S. pressed butt hinges with necessary screws etc. complete-			
	(a) 125x65x2.12 mm	each	24.00	
	(b) 100x58x1.90 mm	each	18.00	
	(c) 75x47x1.70 mm	each	15.00	
	(d) 50x37x1.50 mm	each	9.00	

Item No.	Item	Unit	Rate	Remarks
	(ii) Providing and fixing oxidised M.S. single acting spring hinges with necessary screws etc., complete-			
	(a) 150 mm	each	288.00	
	(b) 125 mm	each	252.00	
	(c) 100 mm	each	174.00	
	(iii) Providing and fixing oxidised M.S. double acting spring hinges with necessary screws etc., complete-			
	(a) 150 mm	each	383.00	
	(b) 125 mm	each	306.00	
	(c) 100 mm	each	197.00	
	(iv) Providing and fixing oxidised M.S. tee hinges with necessary screws etc., complete-			
	(a) 300x115x2.24 mm	each	45.00	
	(b) 250x110x2.24 mm	each	40.00	
	(v) Providing and fixing oxidised M.S. sliding door bolts with nuts and screws etc., complete-			
	(a) 300x16 mm	each	76.00	
	(b) 250x16 mm	each	74.00	
	(vi) Providing and fixing oxidised M.S. Tower bolt (barrel type) with necessary screws etc., complete-			
	(a) 250x10 mm	each	29.00	
	(b) 200x10 mm	each	28.00	
	(c) 150x10 mm	each	20.00	
	(vii) Providing and fixing 85mmx42mm oxidised M.S.. pull bolt lock with necessary screws, bolts, nuts and washers etc. complete.	each	181.00	
	(viii) Providing and fixing oxidised M.S. door latch with screws etc., complete-			
	(a) 300x20x6 mm	each	53.00	
	(b) 250x20x6 mm	each	47.00	

Item No.	Item	Unit	Rate	Remarks
	(ix) Providing and fixing oxidised M.S. handles with necessary screws etc., complete-			
	(a) 125 mm	each	12.00	
	(b) 100 mm	each	10.00	
	(c) 75 mm	each	8.00	
	(x) Providing and fixing oxidised M.S. hooks and eyes			
	(a) 300 mm	each	19.00	
	(b) 250 mm	each	16.00	
	(c) 200 mm	each	15.00	
	(d) 150 mm	each	12.00	
	(e) 100 mm	each	8.00	
	(xi) Providing and fixing oxidised M.S. fan light pivot with necessary screws etc. complete-	each	16.00	
	(xii) Providing and fixing M.S. fanlight catch with necessary screws etc. complete-	each	15.00	
	(xiii) Providing and fixing 300 mm long oxidised M.S. chain with hook for fanlight including necessary screws etc., complete.	each	14.00	
1290	Providing and fixing stainless steel butt hinges with necessary stainless steel screws etc complete.			
	(a)125x2.5mm (heavy)	each	73.00	
	(b)100x2.5mm (heavy)	each	53.00	
	(c)75x2.5mm (heavy)	each	33.00	
	(d)125x1.9mm (light)	each	57.00	
	(e)100x1.7mm (light)	each	38.00	
	(f)75x1.7mm (light)	each	26.00	
1291	Providing and fixing flush door shutters decorative type, core of block board construction with frame of first class hard wood and well matched teak ply veneering with vertical grains or cross bands and face veneers on both faces ofshutters excluding hinges			
	(a)35 mm thick (single leaf)	sqm	2796.00	
	(b)30 mm thick (single leaf)	sqm	2596.00	
	(c)25 mm thick (single leaf)	sqm	2526.00	

Item No.	Item	Unit	Rate	Remarks
1292	Providing and fixing flush door shutters, interior grade, commercial type, core of block board construction with frame of first class hard wood and well matched commercial ply veneering with vertical grains, cross bands and face veneers on both faces of shutters excluding hinges.			
	(a)35 mm thick (single leaf)	sqm	1586.00	
	(b)30 mm thick (single leaf)	sqm	1510.00	
	(c)25 mm thick (single leaf)	sqm	1433.00	
1293	Providing and fixing 97mm thick Gypsum board partition upto ceiling height consisting of frame work "W" / "U" / "L" sections made of G.I. sheet with zinc coating of grade 120, consisting of floor and ceiling channel 50mm wide having equal flanges of 32mm and 0.55mm thick fixed to the floor and ceiling at the spacing of 610mm centre to centre with dash fastener of 12.5mm diameter 40mm length and the studs 48mm wide having one flange of 34mm and other flange 36mm and 0.55mm thick fixed vertically within flanges of floor and ceiling channel and placed at a spacing of 610mm centre to centre by 6mm dia bolts and nuts at both ends of partition fixed flush to wall with rawl plugs at spacing of 450mm centre to centre and fixing of boards to either side of frame work by 25mm dry wall screws on studs, floor and ceiling channels at the spacing of 300mm centre to center and 97mm thick Gypsum board which includes one layer of tapered edge 12.5mm thick Gypsum plaster board (conforming I.S. 2095-1982) screw fixed with 25mm screws at 300mm centre to centre to either side, including jointing and finishing to a flush finish with recommended jointing compound, jointing tape, joint finisher and two coats of primer suitable for board as per manufacture's specification and Direction of Engineer-in-charge all complete.	sqm	666.00	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
20	Cement stays 300mm	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
21	Furniture handles	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-
22	Door handles with plate 100mm	-	-	-	-	2	2	2	1	1	-	-	-	-	-	-	-	2	1	-	-	-	-
23	Window handle with plate 75mm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-
24	Helical door spring (superior quality)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-
25	Ball catcher 10mm dia	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-
26	Cup board or robe lock 65x35mm	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
27	Fan light pivot set.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
28	Fan light catch 14 mm.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-
29	Quadrant stays 300m	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
30	Chain and hooks 300m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
31	Hooks and eyes 150mm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-

Note :-

- (1) Door of room adjoining the verandah, corridor, lobby or hall, shall be considered as external door .
- (2) Where the height of the door leaf exceeds 2.15 meters above the floor level one extra hinge shall be provided for every additional height of 0.50 meter, or part thereof top bolts shall be increased by the height of the leaf above 2.15 meters from floor level.
- (3) Single leaf door shutters of more than 0.80 m width shall be provided with one extra hinge.
- (4) Where the height of window shutter exceeds 1.20 meters one extra hinge shall be provided and length of top bolts shall be increased by the height of the leaf above 2.15 meters from the floor level.
- (5) Fan-light shutters of more than 0.80 meter width shall be provided with one extra hinge and extra quadrant stay
- (6) In double leaf shutters of doors, two door bolts shall be fixed to the first shutter and one to the closing shutter at the top. In case of windows with double shutters, two bolts shall be fixed to closing shutter and one to the 1st shutter at the top.
- (7) In case of single leaf inter-communicating door-shutter, paneled, glazed or paneled bath and W.C. to bedroom. Two door bolts shall be replaced with one door latch 250mm. size.
- (8) For centrally hung and bottom hung C.S. windows and fan-lights, a bamboo pole with hook for opening ventilators shall be provided for each residence or for set of 4 rooms in , case of office building.
- (9) For shutter exceeding 40mm thickness heavy type M.S. butt hinges of 125x90x4mm shall be used.
- (10) Window shutters with steel frames shall be provided with six hinges in case of double leaf shutters and three hinges in case of single leaf shutters, irrespective of height and width of shutters.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
7	Door latch 300mm	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Door latch 250mm	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
9	Tower bolts 250mm	2	1	2	-	-	-	-	-	-	-	-	-	-	-	
10	Tower bolts 150mm	1	1	2	2	2	-	2	-	-	-	-	-	1	1	
11	Tower bolts 100mm	-	-	-	-	-	2	-	1	1	-	-	-	-	1	
12	Door handles 100mm	2	2	2	2	2	-	-	-	-	-	-	2	2	1	
13	Window handles 75mm	-	-	-	-	-	-	-	2	1	-	-	-	-	-	
14	Cupboard or wardrobe knob brass	-	-	-	-	-	2	1	-	-	-	-	-	-	-	
15	Helical door springs 150mm	-	-	-	-	-	-	-	-	-	-	-	-	2	-	
16	Ball catcher 10mm	-	-	-	-	-	2	1	-	-	-	-	-	-	-	
17	Hooks and eyes 100mm	-	-	-	-	-	-	-	2	1	-	-	-	-	-	
18	Chains and hooks 300mm Long.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	
19	Hasps and staples (Safety type) 115m.	-	-	-	-	-	-	-	1	1	-	-	-	-	-	
20	Fan light pivot (set)	-	-	-	-	-	-	-	-	-	-	1	-	-	-	
21	Fan light catch 14 mm	-	-	-	-	-	-	-	-	-	1	1	1	-	-	
22	Quadrant stays 300 mm	-	-	-	-	-	-	-	-	-	1	-	-	-	-	

Note :-

1. Door of room adjoining the verandah, corridor, lobby or hall, shall be considered as external door.
2. Where the height of the door leaf exceeds 2.15 meters above the floor level one extra hinge shall be provided for every additional height of 0.50 meter, or part thereof top bolts shall be increased by the height of the leaf above 2.15 meters from floor level.
3. Single leaf door shutters of more than 80cm. width shall be provided with one extra hinge.
4. Where the height of window shutter exceeds 1.20 meters one extra hinge shall be provided and length of top bolts shall be increased by the height of the leaf above 2.15 meters from the floor level.
5. Fan-light shutters of more than 80 cm width shall be provided with one extra hinge and extra quadrant stay
6. In double leaf shutters of doors, two door bolts shall be fixed to the first shutter and one to the closing shutter at the top. In case of windows with double shutters, two bolts shall be fixed to closing shutter and one to the 1st shutter at the top.
7. For centrally hung and bottom hung C.S. windows and fan lights a bamboo pole with hook for opening ventilators shall provided for each residence or set of 4 rooms in case of office building.
8. In case of single leaf inter-communicating door shutter from both and W.C. to bed room, one 250mm, one 150mm tower bolts shall be replaced with one door latch 250 mm size.
9. For shutter exceeding 40mm thickness, heavy type M.S. Butt hinges of 125x90x4 mm shall be used.
10. Windows shutter with steel frames shall be provided with six hinges in case of double leaf shutters and three hinges in case of single leaf shutters , irrespective of height and width of shutters.

CHAPTER 13 – STEEL AND IRON WORK

Notes:

1. Rates include – (a) Lead up to 100m and all lifts for all materials for all items, unless otherwise stated.
 - (b) Conveyance and delivery, handling, unloading, storing, hoisting and labour for finishing to required shape and size.
 - (c) Straightening of reinforcement steel bars/structural steel sections including removal of harmful scales, coal tar or bitumen or lime, etc., if any, from the surfaces.
2. The steel reinforcement bars for item 1304(a) (Grade 1 of IS : 432 ptl-1982) and 1304 (b) (Grade Fe 415 of IS : 1786-1985) shall conform to the physical properties as specified in relevant I.S.S.
3. The steel reinforcement bars shall withstand tensile test, bend test, rebend test and retest as specified in relevant I.S.S.
4. Measurements:- (a) Dimensions excepting cross-sections and thickness of plate shall be measured to nearest .001m except for reinforcement which shall be measured to nearest 0.005 m.
 - (b) Areas excluding cross-sectional measurements shall be worked out to nearest 0.001 sqm.
 - (c) Weights shall be worked out to nearest kg.
 - (d) Weight of cleats, brackets, packing pieces, bolts, nuts, washers, distance pieces, separators , diaphragm, gussets (taking overall sq. dimensions), fish plates, etc. shall be added to the weight of respective items.
 - (e) An addition of 2.5 percent of the weight of structure shall be made for shop and site rivet heads in riveted steel structures.
 - (f) No deduction shall be made for rivet or bolt holes (excluding holes for anchor or holding down bolts). Deduction in case of rivet or bolt hole shall however be made if its area exceeds 0.02sqm.
 - (g) The weight of steel sheet, plate and strip shall be taken from relevant Indian Standards based on 7.85 kg/sq m for every mm sheet thickness. For rolled steel sections, steel rods and steel strips weight given in Appendix-II (or relevant Indian Standards) shall be used.
 - (h) For forged steel and steel castings, weight shall be calculated on the basis of 7850kg per cum.
 - (i) In the case of welded steel structures no allowance shall be made for the weld metal.
 - (j) Steel reinforcement shall be measured by weight in kg. and shall include cutting to lengths, hooked ends cranking or bending (straight or spiral). Authorised overlaps, chairs/separators shall be measured. Binding wire for reinforcement shall no be measured.

The following Indian Standards may be referred to :-

I.S. No.	Title
278-1978	Galvanised steel barbed wire for fencing (third revision). (with amendment Nos. 1&2) (Reaffirmed 2006)
280-2006	Galvanised steel wire for general engineering purposes (third revision). (with amendment Nos.2)
432(pt-I)-2000	Mild steel and medium tensile steel bars (third revision)
456-2000	Code of practice for plain and reinforced concrete (third revision) (with amendment No.1) (Reaffirmed 2005)
800-1984	Code of practice for general construction in steel (second revised) (with amendment Nos.2) (Reaffirmed 1998)
813-1961	Scheme of symbols for welding (Reaffirmed 2003)
814(Pt.I&II)- 2004	Covered electrodes for metal arc welding of structural steel
816-1969	Code of practice for use of metal arc welding for general construction in mild steel (Reaffirmed 1998)
818-1968	Code of practice for safety and health requirements in electric and gas welding and cutting operations (Reaffirmed 2003)
822-1970	Code of practice of inspection of welds. (Reaffirmed 2003)
1038-1983	Steel doors, windows and ventilators (third revision) (Reaffirmed 2006)
1081-1960	Code of practice for fixing and glazing of metal (steel and aluminum) doors , windows and ventilators (with amendment No.1)
1148-1982	Hot rolled steel rivet bars (up to 40 mm diameter) (for structural purposes) (third revision) (Reaffirmed 2004)
1161-1998	Steel tubes for structural purposes (third revision)
361-1978	Steel windows for industrial buildings (third revision) (with amendment No. 1&2) (Reaffirmed 2006)
1363 (Pt.I,II&III) – 2002	Hexagonal hard bolts, screws & nuts of product grade C.
1566-1982	Specification for hard drawn steel wire fabric for concrete reinforcement. (second revision) (Reaffirmed 2000)
1732-1989	Dimension for round and square steel bars for structural and general engineering purposes (first revision) (with amendment No.1) (Reaffirmed 2004)
1786-1985	High strength deformed steel bars and wires for concrete reinforcement (third revision) (Reaffirmed 2000)
1852-1985	Rolling and cutting tolerance for hot rolled steel product (third revision) (Reaffirmed 2003)
1977-1996	Structural steel (ordinary quality) (second revision) (with amendment No.1 to 3)

2061-1995	Weldable structural steel (fusion welding quality) (third revision) (with amendment No.1) (Reaffirmed 2000)
2140-1978	Standard galvanised steel wire for fencing (first revision) (Reaffirmed 2006)
2502-1963	Code of practice for bending and fixing of bars for concrete reinforcement. (Reaffirmed 2004)
2721-2003	Galvanised steel chain link fence fabric (first revision) (Reaffirmed 1986)
2751-1979	Code of practice for welding of mild steel plain and deformed bars for reinforcement concrete construction (first revision) (Reaffirmed 1998)
3386-1979	Wooden fence posts (first revision) (Reaffirmed 2006)
4082-1996	Recommendation of stacking and storage of construction materials at site (first revision) (Reaffirmed 2003)
4351-2003	Steel door frames (first revision) (with amendment No.1)
4454(I)-2001	Steel door for cold formed springs-patented and cold down steel wires-unalloyed (second revision)
4948-2002	Welded steel wire fabric for general use (first revision) (with amendment No.1)
4996-1984	Reinforce concrete fence posts. (first revision) (Reaffirmed 2006)
6248-1979	Specification for metal rolling shutters and rolling grills. (Reaffirmed 2006)
8629 (Pt-I to III) – 1977	Code of practice for protection of iron and steel structures from atmospheric corrosion. (Reaffirmed 2006)
9077-1979	Code of practice for corrosion protection of steel reinforcement in R.B. and R.C.C. construction. (Reaffirmed 2002)
9417-1989	Recommendations for welding cold worked steel bars for reinforced concrete construction. (Reaffirmed 1994)
9595-1996	Recommendation for metal arc welding of carbon and carbon manganese steel (with amendment No.1) (Reaffirmed 2003)
10521-1983	Collapsible gates. (Reaffirmed 2006)
IRC-21-1979	Standard specifications and code of Practice for Road Bridges-Section III; cement concrete (Plain & reinforced) (first revision)

Item No.	Item	Unit	Rate	Remarks
1301	Steel work in single section including forging and hoisting, fixing in position etc. complete -			
	(a) In R.S. Joists	kg	45.00	
	(b) In angels , channels, flats and tees	kg	45.00	
1302	Labour only for item 1301 (a)	kg	4.00	
1303	Labour only for item 1301 (b)	kg	4.00	
1304	Supplying and fixing steel reinforcement bars (tested) for R.C.C. including cleaning, straightening, cutting, bending, all handling, placing in position and binding with 0.9 mm annealed binding wire confirming to I.S. 280-1978 (including cost of binding wire)-			
	(a) Mild steel bars conforming to Grade-1 of IS : 432 (part-I)	kg	46.00	
	(b) Cold worked steel high strength bars conforming to grade Fe 415 of I.S.: 1786	kg	46.00	
1305	Labour only for binding steel reinforcement bars (tested) for R.C.C. including cleaning straightening, cutting, bending all handling lacing in position and binding with 0.9 mm annealed binding wire confirming to I.S. 280-1978 GI wire-			
	(a) Including cost of binding wire	kg	5.00	
	(b) Excluding cost of binding, wire	kg	4.00	
1306	Steel work in trusses and frame work purlins etc. including cutting, hoisting, fixing in position, including painting with primary coat of lead paint.	kg	52.00	
1307	Labour only for item 1306	kg	10.00	
1308	Steel work in Tubular structures as per approved design consisting of columns, trusses, roof and bottom purlins, base plates, holding down bolts, wind ties, bracings (if required) bolts, nuts and washers for fastening etc., complete with one coat of red oxide zinc chromate primer.	kg	73.00	
1309	Labour only for erection of any kind of steel of tubular trusses including fixing in position	kg	3.00	
1310	Expanded metal netting No.19, 20mm, S.W.M. 3 mmx16BS.W.G. including fixing, with sawn teak wood battens 50mm x 20mm screwed excluding painting.	sqm	473.00	

Item No.	Item	Unit	Rate	Remarks
1311	Fly proof G.I. wire netting including fixing with sawn teak wood battens 50mm x 20mm screwed, excluding painting.	sqm	421.00	
1312	20mm x 25mm hexagonal G.I. Wire netting, including fixing with sawn teak wood battens 50mm x 20mm screwed excluding painting.	sqm	434.00	
1313	Providing welded steel wire fabric (IS: 4948) including fixing with sawn teak wood battens 50mm x 20mm screwed excluding painting.	sqm	453.00	
1314	Labour only for cutting bending laying and fixing in position hard drawn steel wire fabric (IS: 1566) for concrete reinforcement.	sqm	18.00	
1315	Labour only for items 1310 to 1313	sqm	47.00	
1316	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x 2mm at 10cm centre braced with flat iron diagonals 20x5 mm size with top and bottom rail of T-iron 40x40x6 mm with 40 mm dia steel pulleys complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	sqm	2404.00	
1317	Labour only for fixing of item 1316	sqm	191.00	
1318	Providing and fixing 1mm thick M.S. sheet sliding-shutters with frame and diagonal braces of 40x40x6 mm angle iron, 3mm M.S. gusset plates at the junction and comers, 25mm dia, pulley, 40x40x6mm angle and T-iron guide at top and bottom respectively including applying a priming coat of approved steel primer.	sqm	2485.00	
1319	Labour only for fixing of item 1318	sqm	112.00	
1320	Providing, fabricating and fixing in position M.S. grill for window opening (or any other similar opening), wicket gate, Compound gate or over parapets, grill on Staircase etc. or works of similar nature of any pattern, any design (straight or curved) fitted and fixed in position, including all welding, riveting etc., to floors, walls, columns, etc., and repairing the same to the original condition in CM 1:3 complete -			
	(a) M.S. grill consisting of M.S. bars only	kg	59.00	

Item No.	Item	Unit	Rate	Remarks
	(b) M.S. grills consisting of M.S. flats, channels, angle iron, T-section, joists, plates.	kg	62.00	
	(c) M.S. grills consisting of square or hexagonal M.S. bars or sheets.	kg	64.00	
1321	(a) Welding by gas plants including cost of electrodes.	cm	3.00	
	(b) Welding by electric plant including cost of electrodes.	cm	2.00	
1322	Providing and fixing 1mm- thick M.S. sheet garage door with frame of 40x40x6mm angle iron and 3mm M.S. gusset plates at the junction and comers , all necessary fittings complete including applying a primary coat of approved steel primer -			
	(a) using M.S. angles 40 x 40 x 6 mm for diagonal braces.	sqm	2334.00	
	(b) Using flats 30x6 mm for diagonal braces and central piece.	sqm	2221.00	
1323	Labour only for fixing for -			
	(a) Item 1322 (a)	sqm	187.00	
	(b) Item 1322 (b)	sqm	187.00	
1324	Supplying and fixing rolling shutters of approved make, made of 80x1.25mm laths interlocked together through their entire length and jointed together at the end by end locks mounted on especially designed pipe shaft with Brackets, side guides and arrangements fore inside and outside locking with push and pull operation complete including the cost of providing and fixing necessary 27.5 cm long wire spring grade-2, I.S.:454-Part-II-1981 and M.S. top cover 1.25 mm thick for rolling shutters.	sqm	1441.00	
1325	Providing and fixing 27.5 cm long wire spring grade 2 for rolling shutters.	each	394.00	
1326	Providing and fixing ball bearing for rolling shutters.	each	424.00	
1327	Providing and fixing top cover for rolling shutters.	m	200.00	

Item No.	Item	Unit	Rate	Remarks
1328	Extra for providing mechanical device, chain and crank operation for operating rolling shutters-			
	(a) Exceeding 10sqm and up to 16.8 sqm in area.	sqm	412.00	
	(b) Exceeding 16.8 sqm in area	sqm	483.00	
1329	Fixing standard steel glazed doors, windows and ventilators in wall with 15x3 mm lugs 10cm long embedded in cement concrete blocks 15x15x10cm of 1:3:6 C.C. with 20mm graded metal or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required, including fixing of glass panes with glazing clips and special metal sash putty of approved make or metal beading with screws (only steel windows with lugs glass panes cut to size and glazing clip or metal beading with screws, shall be supplied by department free of cost).	sqm	118.00	
1330	Providing and fixing steel glazed doors, windows and ventilators of standard rolled steel sections, joints mitred and welded with 15x3 mm lugs 10cm long, with steel lugs, embedded in cement concrete blocks 1x15x10cm of 1:3:6 with 20mm graded metal or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required including providing and fixing of glass panes with glazing clips and special metal sash putty of approved make complete including Applying a priming coat of approved steel primer, excluding the cost of metal beading and other fittings except necessary hinges or pivots as required :-			
	(a) Doors	sqm	2262.00	
	(b) Windows fixed	sqm	1674.00	
	(c) Windows side hung	sqm	2149.00	
	(d) Ventilators top hung	sqm	2209.00	
	(e) Ventilators centre hung	sqm	2387.00	
1331	Extra for providing and fixing steel beading of approved shape and section with screws instead of glazing clips and metal sash putty-			
	(a) Steel doors	sqm	291.00	
	(b) Steel windows	sqm	356.00	
	(c) Steel ventilators	sqm	360.00	

Item No.	Item	Unit	Rate	Remarks
1332	Providing and fixing T-iron frames for doors, windows and ventilators of metal steel T-section, joints mitred and welded with 15x3 mm lugs 10cm long embedded in cement concrete blocks 15x15x10 cm size of 1:3:6 c.c. with 20mm graded metal or with wooden plugs and screws or rawl plugs and screws, or with fixing clips or with bolt and nuts as required including fixing of necessary butt hinges and screws and applying a priming coat of approved steel primer	kg	63.00	
1333	Providing and fixing M.S, fan clamp type 1 (of building code of India 1970), 16mm dia M.S. bar bent to shape with hooked end in R.C.C. slabs during laying including painting the exposed portion of loop, all as per standard design completed.	each	83.00	
1334	Extra over rate of item 1333 for providing and fixing M.S. fan clamp type 2 (of Building code of India 1970) as per standard design in R.C.C. beams during laying towards the additional height of the clamp due to beam	per cm height	1.00	
1335	Providing and fixing M.S. round holding down bolts with nuts and washer plates complete.	kg	82.00	
1336	Providing and fixing bolts up to 300mm in length including nuts and washers complete.	kg	79.00	
1337	Providing and fixing bolts above 300 mm in length including nuts and washers complete.	kg	79.00	
1338	Labour only of item 1336 and 1337	kg	10.00	
1339	Providing and fixing of M.S. rivets in sizes in position	kg	110.00	
1340	Providing and fixing a 1m high fencing with precast 1:2:4 R.C. line posts of 1.5m in length with metal of maximum size 12.5 mm with 6mm dia. M.S. bar placed one at each corner with 3mm dia. Steel ties with spacing 20c.m. placed at maximum 3m apart (corner end and every 10 th post to be strainer post of 1.6m length and strutted with strut of 1.6 m length line and strainer posts embedded in 1:5:10 c.c. 30x30x40 cm, the foundation level at 10cm below the bottom level of posts struts resting over c.c. block of size 50x25x12.5 cm including excavation, providing with 3 horizontal rows and two diagonals of barbed wire.	m	191.00	

Item No.	Item	Unit	Rate	Remarks
1341	Supplying 1:2:4 R.C.C. precast fencing posts (IS:4996) 1.5m long and 125x100mm in size with graded metal of maximum size 12.5 mm including form work finishing and curing etc., complete.	each	163.00	
1342	Supplying of 1:2:4 R.C.C. strainer posts (IS:4996) 1.6m long and 125x125 mm in size with graded metal 12.5 mm including form work, finishing and curing etc., complete .	each	193.00	
1343	Supplying of 1:2:4 R.C.C. 1.6m long strut or braces- (I.S.: 4996) of size 85x85 mm with graded metal 12.5 mm including form work finishing and curing etc., complete.	each	131.00	
1344	Wire fencing with 1.8 m to 2.5 m apart 1.2m above ground level and 45cm below G.L. fixed in lime concrete or cement concrete 1:5:10 (30x30x30 cm) including diagonal struts at comers and at every seventh post, oil painting with two coats on each post etc., complete -			
	(a) Barbed wire 9.38 kg per 100m (min.) with angle iron posts 50x50x6 mm 3 rows of wire	m	288.00	
	(b) Barbed wire 9.38 kg per 100m (min.) with angle iron posts 40x40x6mm 3 rows of wire.	m	237.00	
	(c) Barbed wire 9.38 kg per 100m (min.) with teak wood ballies 120mm dia 3 rows of wire.	m	129.00	
	(d) Seven strained plain G.I. wire 16 gauge with angle iron posts 50x50x6 mm 3 rows of wire.	m	299.00	
	(e) Plain seven strained G.I. wire with angle iron posts of 40x40x6mm 3 rows of wire.	m	235.00	
1345	Add for each additional row of wire in-			
	(a) Item 1344 (a) , (b) and (c)	m	8.00	
	(b) Item 1344 (d) and (e)	m	12.00	
1346	Add for each additional 0.3m height of pole-			
	(a) For angle iron post 50x50x6 mm	m	55.00	
	(b) For angle iron posts 40x40x6mm	m	43.00	
	(c) For teak wood ballies 120mm dia	m	12.00	
1347	Deduct for cost of wire for each row in -			
	(a) Item 1344 (a) , (b) and (c)	m	7.00	
	(b) Item 1344 (d) and (e)	m	12.00	

Item No.	Item	Unit	Rate	Remarks
1348	Labour only for fixing posts in lime concrete or cement concrete.	each	28.00	
1349	Labour only for straining add fixing barbed wire to wood, concrete or iron post, including screwing with G.I. tying wires, G.I. staples or steel pins etc., (excluding cost of wire, staple, pins) for each row of wire.	m	7.00	
1350	Labour only for straining and fixing G.I. plain wire to wood, concrete or iron posts including screwing with G.I. Staples of steel pins (excluding cost of wire, staple, pins) for each row of wire.	m	4.00	
1351	Supplying and fixing turn buckles and straining bolts for barbed wire fencing.	each	136.00	
1352	1.2 m high welded steel wire fabric conforming to I.S:226-1975 fencing with 1.8 m R.C.C. posts of standard design placed every 3 m apart, embedded in cement concrete blocks 45x45x60 cm of mix 1:5:10 with 40 mm metal corner end and every 10 th post to be strutted and struts embedded in cement concrete blocks 70x45x50 cm of the same mix provided with welded steel wire fabric 0.9 m wide rectangular mesh 75x25 mm size weighing not less than 7.75 kg/m ² fixed between the posts fitted and fixed with G.1 staples on wooden plugs tied to 6mm bar ribs with binding wire including earthwork excavation, concrete work and cost of posts, struts etc., complete.	m	691.00	
1353	Labour only for item 1352	m	14.00	
1354	Wire mesh fencing (50 mm 18 SWG) with angle iron posts 40mmx40mmx6mm 1.8 m to 2.5 m apart 1.20 above G.L. 45 cm below G.L. fixed in lime concrete or cement concrete 1:5:10 (30x30x30 cm) including diagonal struts at corners, oil painting of posts with 2 coats complete.	m	389.00	
1355	woven wire fencing (10 gauge) with angle iron posts 40x40x6 mm 1.8 to 2.5 m apart 1.2 m above G.L. 45 cm below G.L. fixed in lime concrete or cement concrete 1:5:8 (30x30x30 m) including diagonal struts at comers, oil painting of posts with 2 coats etc. COMPLETE	m	393.00	
1356	Labour for fixing wire mesh or woven wire fencing to post as in item 1354 and 1355.	m	9.00	

CHAPTER 14-CEILING AND WALL BOARDING

Notes :-

1. Rates include- (a) Lead up to 100 m for all materials for all items unless specified otherwise.
- (b) All leads for all fastenings.
- (c) All lifts for all materials for all items.
- (d) Cutting of boards or sheets to required size and shape to conform to the pattern of paneling as ordered and each panel being in one whole piece.
- (e) Supplying and fixing with G.I. or brass screws, nails or panel pins as ordered.
- (f) All necessary scaffolding and other materials required for completing the work.
2. Rates do not include painting, varnishing and white washing.
3. For ceiling or wall boarding, lead shall be measured from the nearest railway station or market place whichever is nearer.
4. Rates for ceiling shall also be applicable for partitions, soffits, eve boards and sunshades, unless they are provided separately.
5. The item 1410 shall also be applicable for ceiling with celetex, treetex, unitex, insulite, masconite, nova teak boards, standard press wood similar other approved hard boards.
6. Measurements: - (a) Dimensions shall be measured to the nearest 0.01 m. Areas shall be worked out to the nearest 0.01 sqm.
- (b) All works shall be measured net, as fixed no allowance being made for wastage.
- (c) No deduction shall be made for openings not exceeding 0.4 sqm.
7. No work of teakwood shall be carried out with out written permission of Chief Engineer.
8. The plank thickness may vary from 15 to 20 mm. The width of plank shall be 100 to 150 mm.
9. The following Indian Standards may be referred to-

I.S. No.	Title
287-1993	Recommendations for maximum permissible moisture content for timber used for different purposes (third revision) (with amendment No. 1) (reaffirmed 2003)
303-1989	Plywood for general purposes (third revision)(with amendment No. 1 to 3) (reaffirmed 2003)
401-2001	Code of practice for preservation of timber (fourth revision) (with amendment No. 1) (reaffirmed 2006)
419-1967	Putty for use on window frames (first revision) (with amendment No. 1) (Reaffirmed 2002)
723-1972	Steel countersunk head wire nails (second revision)(with amendment No. 1 to 3) (Reaffirmed 2006)
749-1978	Handloom cotton Dungri cloth (first revision)(reaffirmed 2003)
1141-1993	Code of practice for seasoning of timber (first revision)(with amendment No. 1 & 2)
1331-1971	Cut size of timber (second revision) (reaffirmed 2006)
1658-1977	Specifications for fiber hard boards (third revision).
2098-1997	Specifications for asbestos cement building boards (with amendment No. 1 & 2)(Reaffirmed 2007)

2441-1984	Code of practice for fixing ceiling covering (first revision) (reaffirmed 2000)
2818 (pt.I to Part IV) 1990	Indian Hessian General (first revision. (with amendment No. 1)
3087-2005	Wood particle boards (medium density) for general purposes (with amendment No. 1)
3097-1980	Veneered particle boards (second revision)
3348-1965	Fiber insulation boards (with amendment No. 1) (reaffirmed 2005)
5390-1984	Code of practice for construction of timber ceilings (first revision) (reaffirmed 2000)
6730-1972	Felt nails (Reaffirmed 2006)
6760-1972	Slotted countersunk head wood screws (with amendment No. 1) (Reaffirmed 1999)

Item No.	Item	Unit	Rate	Remarks
1401	Providing and fixing teak wood plain with tongued and grooved jointing and screws (framework and cover fillets to be measured and paid for separately)-			
	(a) 12 mm thick	sqm	1198.00	
	(b) 20mm thick	sqm	1964.00	
1402	Labour only for Item 1401	sqm	49.00	
1403	Providing and fixing teak wood ceiling with tongued and grooved jointing and wood screws (frame work and cover fillets to be measured & paid for separately).			
	(a) 12 mm thick	sqm	1198.00	
	(b) 20 mm thick	sqm	1964.00	
1404	Labour only for item1403	sqm	95.00	
1405	Deduct for butt jointing in place of tongued and grooved type joint in items 1401 and 1403.	sqm	18.00	
1406	Labour only for item1405	sqm	16.00	
1407	Providing and fixing cloth ceiling with teak wood battens of finished size 50 mmx20mm planed, moulded, beaded and screwed to the frame work above for panels excluding frame work-			
	(a) Textile cloth (IS:749-1978)	sqm	218.00	
	(b) Hessian cloth (IS;2818 Pt. 1-1971)	sqm	205.00	
1408	Labour only for item 1407	sqm	24.00	
1409	Providing and fixing 5 mm thick asbestos cement sheet ceiling (IS: 2098-1964), fixed with sawn teak wood battens of finished size 50 mm x 20 m excluding joists.	sqm	425.00	
1410	Labour only for item 1409	sqm	45.00	

Item No.	Item	Unit	Rate	Remarks
1411	Providing 10mm thick plaster of paris (Gypsum anhydrous) ceiling height of 5m. above floor level over strips (Sal, Bija, Haldu) 25x6mm with 10mm gap in between and reinforced with rabbit wire mesh fixed into wooden frame (Frame work to be paid separately)			
	(a)Flat surface	sqm	714.00	
	(b)Curved surface	sqm	745.00	
1412	Add extra for sunk or raised mouldings in the plaster of paris (Gypsum anhydrous) ceiling.	sqm	148.00	
1413	Add Extra for providing plaster of paris (Gypsum and anhydrous) ceiling above 5 M. height from floor level.	sqm	37.00	
1414	Providing and fixing 12mm thick plaster of paris (Gypsum Anhydrous) ceiling upto a height of 5 M. above floor level over wooden frame and rendering smooth with plaster of paris (Frame work to be paid separately).	sqm	165.00	
1415	Providing and fixing false ceiling with frame work consisting of main and cross runners of anodised aluminium tees of sizes 38mmx25.5mmx1.5mm or equivalent size of angles connected with the help of aluminium elbows/ angles by means of screws/nuts and bolts of required size to form a grid of not more than 610mmx610mm together with anodised aluminium angle of 38mmx38mmx1.5mm size with teak wood plugs and M.S. screws 750 mm centre to centre fixed to the walls and supporting the entire frame work with ceiling by mean of 6mm dia M.S. hangers space between roof and ceiling upto one metre bent to the required shape and M.S. holding cleats of M.S. flats 25mmx6mm painted with one coat of red oxide paint complete of 1220mm centre to centre on either direction and cutting R.C.C. slab and repairing the same in C.M. 1:3 after hanging/ connecting M.S. to the main reinforcement including supplying fixing over aforesaid frame with ceiling tiles.			
	(i)12mm thick unveneered Nova teak or equivalent super plain tiles	sqm	396.00	
	(ii)12 mm thick half random perorated tiles Perforated area 5%	sqm	408.00	
	(iii)12 mm thick half random perorated tiles Perforated area 13%	sqm	444.00	

CHAPTER – 15 ROOFING

Notes:-

1. Rates include- (a) Lead up to 100 m for all materials for all items unless otherwise specified.
(b) All lifts for all materials
(c) All lead for roof fastening materials, bitumen and bitumen felts
2. Lead for G.I. or A.C. sheets and stones slabs shall be measured from the nearest railway station or market place, whichever is nearer.
3. The rates for G.I. or A.C. sheet roofing are inclusive of necessary overlaps and wastage in cutting and all standard screws nuts, washers, bolts “J” hooks and other fasteners.
4. The rates include, unless otherwise, stated, where necessary, handling, unloading, storing, fabrication, hoisting, all labour for finishing to required shape and size.
5. The surface of flat roofs shall have a minimum slope of 1 in 120. Adequate openings both in number and size shall be provided to drain out the rain water. For every 50 sqm. of roof area, one 100 mm dia rain water pipe shall be provided.
6. Water proofing of roofs with bitumen felts, involving execution of items 1544 to 1553, shall not be done without prior written sanction of the Chief Engineer/Superintending Engineer.
7. Measurement- (a) Dimensions shall be measured to the nearest 0.01 sq.m. The area shall be worked out to the nearest 0.01 sqm. The cubical contents shall be worked out to the nearest 0.01 cum.

(b) The superficial area of roof coverings and claddings as laid shall be measured on the flat in sqm. Without allowance for laps and corrugations, if any
(c) Portions of roof covering overlapped by ridge or hip, etc. shall be included in the measurements of the roof.
(d) Any opening not exceeding 0.4 sq.m. Shall not be deducted.
(e) No additions shall be made for laps cut through.
(f) Sheeting curved or bent to curvature shall be measured separately.
(g) Ridges and hips shall be measured in running meters along the centre line, where in two pieces shall be measured as one length.
8. The following Indian Standards may be referred to:-

I.S. No.	Title
73-2006	Paving bitumen (second revision)
269-1989	Specifications for 33 grade ordinary Portland cement (fourth revision). (reaffirmed 2004)
277-2003	Galvanised steel sheets (plain and corrugated) (sixth revision).
280-2006	Mild steel wire for general engineering purposes (fourth revision) (Reaffirmed 1987)
455-1989	Specifications for Portland slag cement(third revision) (reaffirmed 2005)

459-1992	Unreinforced corrugated and semi-corrugated asbestos cement sheets (second revisions) (With amendment No.1) (Reaffirmed 2003)
513-1994	Specifications for low carbon cold rolled carbon steel sheets and strips (fourth revision) (reaffirmed 1998)
654-1992	Clay roofing tiles, Mangalore pattern (third revision) (with amendment Nos. 1 to 3) (reaffirmed 2002)
702-1988	Specifications for industrial bitumen (second revised) (reaffirmed 1999)
712-1984	Specification for building limes (third revision) (reaffirmed 2000)
723-1972	Steel countersunk head wire nails (second revision) (with 3 amendments) (reaffirmed 2006)
790-1987	Hook bolts for corrugated sheet roofing (second revision) (with amendment No.1) (Reaffirmed 2003)
883-1994	Code of practice for design of structural timber in building (fourth revision) (reaffirmed 2005)
1079-1994	Specifications for hot rolled carbon steel sheet and strip (third revision) (reaffirmed 1998)
1121()P2-1974	Methods of test for determinations of strength properties of natural building stones : Part 2 transverse strength (first revision) (Reaffirmed 1987)
1322-1993	Bitumen felts for water proofing and damp – proofing (fourth revision) (Reaffirmed 2003)
1344-1981	Specifications for calcined puzzolana (second revision) (Re 2004)
1345-1960	Code of practice for water proofing of roofs with bitumen felts (second revision) (reaffirmed 2000)
1464-1992	Clay ridge and ceiling tiles (first revision) (with amendment No.1) (reaffirmed 2002).
1635-1992	Code of practice for field slaking of building lime and preparation of putty. (reaffirmed 2003)
2527-1984	Code of practice for fixing rain-water gutters and down pipes for roof drainage (first revision) (reaffirmed 2000)
2690-(Pt.I) 1993	Specifications for burnt clay flat terracing tiles Part I : Machine made (first revision) (Amendment No.1)
2690-(Pt.II)-1992	Specifications for burnt clay flat terracing tiles Part II : Hand made (Amendment No.1)
2792-1964	Code of practice for design and construction of stone slab over joist floor. (reaffirmed 2000)
2858-1984	Code of practice for roofing with Mangalore tiles. (first revision) (reaffirmed 2000)
3007(Pt.I)-1999	Code of practice for laying of asbestos cement sheets.
3036-1992	Code of practice for laying of lime concrete for water proofed roof Finish (second revision) (reaffirmed 2003)
3067-1988	Code of practice for general design, details and preparatory work for damp proofing and water proofing of buildings (first revision) (reaffirmed 2000)

3068-1986	Specification for broken brick (burnt clay) coarse aggregates for use in lime concrete (first revision) (reaffirmed 2000)
3384-1986	Bitumen primer for use in water proofing and damp-proofing (first revision) (reaffirmed 2000)
4098-1983	Specification for lime pozzolana mistune (first revision) (with amendment No.2) (reaffirmed 1999)
6733-1972	Wall and roofing nails (with amendment No.1) (Reaffirmed 2006)
6745-1972	Methods for determination of weight of zinc coated iron and steel article. (reaffirmed 2006)
6760-1972	Slotted counter sunk head wood screws (with 2 amendments) (reaffirmed 2006)
8869-1978	Washers for corrugated sheet roofing(Reaffirmed 2006)
8910-1978	General technical delivery requirements for steel and steel products. (reaffirmed 2001)

Item No.	Item	Unit	Rate	Remarks
1501	Providing and laying single country tiles (without battens) complete	sqm	140.00	
1502	Labour only for item 1501	sqm	40.00	
1503	Providing and laying single country tiles on whole bamboo battens.	sqm	270.00	
1504	Labour only for item 1503	sqm	44.00	
1505	Providing and laying single country tiles on 50x20 mm sawn teak wood battens	sqm	556.00	
1506	Labour only for item 1505	sqm	47.00	
1507	Add for double country tiling in items 1503 and 1505	sqm	140.00	
1508	Add for labour for double country tiling in items 1502,1504 and 1506	sqm	40.00	
1509	Providing and laying single Allahabad tiles without battens but including hip and ridge tiles.	sqm	306.00	
1510	Labour only for item 1509	sqm	53.00	
1511	Providing and laying Mangalore tiles without hip or ridge tiles and without battens.	sqm	223.00	
1512	Labour only for item 1511	sqm	53.00	
1513	Providing and laying Mangalore hip and ridge tiles , set in cement mortar 1:3	m	98.00	
1514	Labour only for item 1513	m	28.00	
1515	Turning tiles for repairs (single country tiles, single Allahabad or Mangalore tiles) (excluding cost of tiles)	sqm	11.00	

Item No.	Item	Unit	Rate	Remarks
1516	Turning tiles for repairs (double country tiles) without tiles.	sqm	22.00	
1517	Providing class 1 corrugated galvanized iron sheet roofing, fixed with G.I. J.or L hooks, bolts and nuts 8 mm dia with bitumen and G.I. J. limpet washers or with G.I. limpet washers filled with white lead complete, excluding wind tiles, wooden scantling, hips and ridges -			
	(a) with 1.25mm thick sheet	sqm	1036.00	
	(b) with 1.00mm thick sheet	sqm	851.00	
	(c) with 0.80 mm thick sheet	sqm	703.00	
	(d) with 0.63 mm thick sheet	sqm	577.00	
1518	Labour only for item 1517	sqm	24.00	
1519	Providing ridges or hips 60cm over all in plain G.I. Sheet fixed with G.I.J or L Hooks, bolts and nuts 8mm dia G.I. limpet and bitumen washers complete -			
	(a) with 1.25mm thick sheet	m	626.00	
	(b) with 1.00mm thick sheet	m	523.00	
	(c) with 0.80mm thick sheet	m	448.00	
	(d) with 0.63mm thick sheet	m	377.00	
1520	Labour only for item 1519	m	63.00	
1521	Providing and fixing galvanized iron sheet valley gutters on 10mm thick teak wood planks, fitted and fixed complete -			
	(a) With 1.25mm thick sheet	sqm	1666.00	
	(b) With 1.00 mm thick sheet	sqm	1579.00	
	(c) With 0.80mm thick sheet	sqm	1508.00	
	(d) With 0.63mm thick sheet	sqm	1420.00	
1522	Labour only for item 1521	sqm	148.00	
1523	Deduct from item No. 1521 for plain galvanized valley gutters fitted and fixed complete, without wooden planking.	sqm	889.00	
1524	Labour only for item 1523	sqm	73.00	
1525	Providing and fixing corrugated asbestos cement sheets roofing, fixed with galvanized iron J or L hooks, bolts and nuts 8 mm dia G. I. plain and bitumen washers, etc. complete, but excluding ridges, hips, battens and joists, with 6 mm thick sheet.	sqm	336.00	

Item No.	Item	Unit	Rate	Remarks
1526	Labour only for item 1525	sqm	13.00	
1527	Providing and fixing ridges and hips in Asbestos cement sheets roofing with, G.I. J or L hooks bolts and nuts 8 mm dia G.I. plain and bitumen washers, etc. complete with 6 mm thick sheet.	m	292.00	Length for calculating area shall be measured along the curvature of sheet
1528	Labour only for item 1527	m	15.00	
1529	Providing and fixing A.C. sheet curved roofing fixed with G.I. J or L hooks, bolts and nuts, 8mm dia G.I. plain and bitumen washers, etc. complete.	sqm	326.00	
1530	Labour only for item 1529	sqm	15.00	
1531	Providing and fixing cut stone slabs (chisel dressed) for roofs including flush pointing of the bottom, in cement mortar 1:3 and filling the joints, in cement mortar 1:4 curing etc., complete.	cum	6342.00	
1532	Providing and fixing cut stone slabs (chisel dressed) for roofs including flush pointing of the bottom, in cement mortar 1:3 and filling the, joints, in cement mortar 1:4, curing etc., complete without the cost of stone.	cum	1889.00	
1533	Labour only for item Nos. 1531 and 1532 water proofing of roof slabs.	cum	1830.00	
1534	Floating liquid cement on R.C.C. slabs to server as grout to staunch any porous patches in slabs.	sqm	10.00	
1535	Painting top of roofs (for all floors) with hot 30/40 bitumen at 1.70 kg per sqm. Impregnated with a coat pf coarse sand at 0.006 cum per sqm. Including cleaning the slab surface with brushes and finally with Kerosene oil complete.	sqm	81.00	
1536	Labour only for item 1534	sqm	3.00	
1537	Labour only for item 1535	sqm	10.00	

Item No.	Item	Unit	Rate	Remarks
1538	Providing and laying for courses water proofing treatment with bitumen felt over roofs, consisting of first and third courses of blown or / and residual bitumen applied hot at 1.2 kg. Per sq.m. of area for each course second course of roofing felt type 3 grade (Hessian base self finished bitumen felt and fourth and final courses of stone grit 6 mm and down size or pea sized gravel spread at 0.006 cum per sqm including preparation of surface excluding grading and applying primer.	sqm	247.00	
1539	Supplying bituminous solution primer conforming to I S: 3384- 1965 at 0.24 liter per Sq. meter	sqm	17.00	
1540	Deduct for omitting in item 1538 final course of spreading stone metal 6mm and down size or pea sized gravel at 0.006 cum per sqm.	sqm	5.00	
1541	Grading roof for item No.1538 with	cum		
	(a) Cement concrete 1:2:4 with graded metal of maximum size 20 mm	cum	2780.00	
	(b) Cement mortar 1:3	cum	3016.00	
	(c) Cement mortar 1:4	cum	2417.00	
1542	Providing and laying plastic roofing compound standard black (using 2.75kg per sqm) over a surface painted with cold plastic roofing liquid compound at 0.24 liter per Sq. meter including spreading coarse sand over the top surface at 0.006 cum per sqm etc. complete.	sqm	225.00	
1543	Labour only for item 1538	sqm	25.00	
1544	Labour only for item 1539	sqm	5.00	
1545	Labour only for item 1540	sqm	2.00	
1546	Labour only for			
	(a) Item 1541 (a)	cum	523.00	
	(b) Item 1541 (b) and (c)	cum	1125.00	
1547	Labour only for Item 1542	sqm	11.00	

CHAPTER 16 – RCC AND FORM WORK

Notes :-

Rates include- (a) Lead up to 100 m for all materials for all items

(b) Cost of all material including cost of water

(c) All lifts for all materials unless specified otherwise.

(d) Mixing of concrete in mixer.

(e) Mechanical vibration of concrete.

(f) Finishing to all surface of R.C.C.

(g) Cost of curing.

2. (a) Rates are for metal other black trap, or granite.
 (b) Blasting charges for metal are payable as per Item 514 for quantity required vide appendix-1.
 (c) Extra rate for use of black trap, basalt or granite is payable as per item 733.

3. For nominal mix (volumetric mix concrete) the boxes of internal size 35x25 and 40 cm depth shall be used for measuring sand and aggregate.

(a) The proportion of materials for nominal mix shall be used as given in table 13 of specification Vol. I para 7.5.2.4.1 of page 7 – 32. It should be on the basis of weight of cement & aggregates. Nominal mix proportion by volume under special circumstances only may be permitted by the Chief Engineer/Superintending Engineer under written orders before commencing the work. A rough guide for the nominal mix proportion by volume will be 1:5: 10, 1 : 4 : 8, 1 : 3 : 6, 1: 2 : 4, 1 : 1, 5 : 3, 1 : 1 : 2, for M-5,M-7,M-10,M-15,M-20, & M-25 concrete respectively.

(b) For cement which normally comes in bag and used by weight volume shall be worked out taking 50 kg. of cement as 0.035 cum. in volume. The quantity of water per 50 kg. (0.035cum.) of cement shall be as specified in table-13 of specification.

(c) Design mix concrete shall be mixed with cement contents as per design or minimum required as per table below :-

Concrete Mix	Minimum cement per cum of concrete	Specified characterstics compressive strength at 7 days	Specified characterstics compressive strength at 28 days
M-20	390 kg	13.5 N/sqmm	20 N/sqmm
M-25	410 kg	17.0 N/sqmm	25 N/sqmm
M-30	420 kg	20.0 N/sqmm	30 N/sqmm
M-35	428 kg	23.5 N/sqmm	35 N/sqmm
M-40	435 kg	26.5 N/sqmm	40 N/sqmm

4. The proportioning of sand shall be done on the basis of its dry volume and in case of damp sand, allowance or bulk age shall be made as given in note 4- of chapter 6 "Mortars".

5. The rates for form work include- (a) All lifts and all leads unless otherwise specified.
- (b) Providing, erection and stripping of shuttering, propping and centering and strutting.
- (c) Dressing with oil to prevent adhesion of concrete with shuttering, inclusive of cost of refined pale paraffin mineral oil/ raw linseed oil, after thoroughly cleaning the surface.
6. The form work shall be of metal sheet lining, plywood, steel (steel plates stiffened with sheet angles) or any other material depending upon the requirement of work.
7. Measurements:- R.C.C. (i) Dimensions shall be measured to nearest 0.01 m. except for the thickness of slab which shall be measured to nearest 0.05 m. The areas shall be worked out to nearest 0.01 sq.m. The cubical contents shall be worked out to nearest 0.01 cum.
- (ii) No deduction shall be made for the following:-
- (a) Ends of dissimilar materials for example beams posts girders, rather, purling trusses, corbels and step up to 0.5 sqm. in cross section;
- (b) Opening up to 0.1 sqm. in area (in calculating area of an opening, the thickness of any separate lintel or sill shall be included in height. No. extra labour for forming such openings or voids shall be measured):
- (c) Volume occupied by reinforcement;
- (d) Volume occupied by pipes, conduits, sheathing etc. not exceeding 0.1 sqm. each in cross sectional area; and
- (e) Moulds, drip moulding, chamfers, splays, routed or coved angles, beds, grooves and rebates up to 10 cm in width or 15 cm in girth.
- (iii) Columns shall be measured from top of columns base to underside of first floor slab and subsequently from top of floor slab to underside of floor slab above
- (iv) In case of columns for flat slabs, flare of column shall be included with column for measurement.
- (v) Beams shall be measured from face to face columns and shall include haunches, if any, between columns and beams. The depth of beams shall be measured from bottom of slab to bottom of the beam except in case of inverted beams where it shall be measured from top of slab to top beam.
- (vi) Dimensions shall be measured to nearest 0.01 m and area shall be worked out to nearest 0.01 sq.m.
- (vii) Form work shall be measured as the actual (surface in contact with concrete or any other material requiring formwork).
- (viii) No deduction shall be made for opening up to 0.4-sqm.

8. The following Indian standards may be referred to:-

I. S. No.	Title
269-1989	Specification for 33 grade ordinary Portland cement (fourth revision)
383-1976	Specification for coarse & fine aggregate from natural source for concrete (third revision) (reaffirmed 2006)

455-1989	Specification for port land slag cement(third revision)(amendment No. 1,2,3,4,5,6&7) (reaffirmed 2005)
456-2000	Code of practice for plain and reinforced concrete (third revision)(with amendment No. 2) (reaffirmed 2005)
457-1957	Code of practice for general construction of plain and reinforced concrete for Dam and other massive structures. (reaffirmed 2005)
516-1959	Method of test for strength of concrete (amendment No. 2) (reaffirmed 2004)
1199-1959	Method of sampling & analysis of concrete. (reaffirmed 2004)
1343-1980	Code of practice of prestress concrete (first revision) (reaffirmed 2005)
1489-1991	Specification for port land pozzolana cement (second revision) (amendment No.1,2,3,4,5,6&7) (reaffirmed 2005)
1791-1985	Specification for Batch type concrete mixers (second revision) (reaffirmed 2005)
2386(Pt I)-1977	Method of Test for aggregate for concrete part-1 particle size & shape (Amendment No.1) (reaffirmed 2007)
2386(Pt II)-1977	Method of Test for aggregate for concrete part-2 Estimation of deteriorous material & organic impurities (Amendment No. I) (reaffirmed 2007)
2386(Pt 3)-1977	Method of Test for aggregate for concrete part-3 Specific gravity, density, voids, absorption & bulking. (reaffirmed 2007)
2386(Pt 4)-1977	Method of Test for aggregate for concrete part-4 Mechanical properties (Amendment No. (reaffirmed 2007)
2386(Pt 5)-1977	Method of Test for aggregate for concrete part-5 soundness. (reaffirmed 2007)
2386(Pt 6)-1977	Method of Test for aggregate for concrete part-6 measuring mortar making properties of line aggregate (Amendment No. 1) (reaffirmed 2007)
2386(Pt 7)-1977	Method of Test for aggregate for concrete part-7 Alkali aggregate activity. (reaffirmed 2007)
2386(Pt 8)-1977	Method of Test for aggregate for concrete part-8 Petri graphic examination. (reaffirmed 2007)
2405-(Pt-2)-1980	Specification for industrial sieve part-2 perforated plants. (reaffirmed 2006)
2430-1986	Method for sampling of aggregate for concrete. (reaffirmed 2005)
2505-1998	General requirements for concrete- vibrators, immersion type (second revision). (reaffirmed 2004)
2506-1985	General requirements for screed board concrete vibrators. (reaffirmed 2005)
2514-1963	Specification for concrete vibration tables. (reaffirmed 2001)
3535-1986	Methods of sampling hydraulic cement (First revision). (reaffirmed 2004)
3812-2003	Specification for fly-ash for uses pozzolana & admixture (Second Revision).
4031-1996 (Pt-1 to 15)	Methods of physical test for hydraulic cement.
4032-1985	Methods of chemical analysis of hydraulic cement (first revision). (reaffirmed 2005)

4082-1996	Recommendation on stacking & storing type concrete Mixers. Of construction material at site (second revision) (reaffirmed 2003)
4634-1991	Method of testing performance of batch type concrete Mixers. (reaffirmed 2005)
4656-1968	Specification for form vibrators for concrete. (reaffirmed 2001)
4925-2004	Specification for concrete batching and missing plant. (reaffirmed 2005)
6542-1989	Specification for high Alumina cement for structure use (amendment No. 1,2,&3) (reaffirmed 2005)
6461-Pt-1 to 7) – 1972	Glossary of terms relative to cement concrete. (reaffirmed 2007)
6461-Pt 8 to 12)- 1973	Glossary of terms relative to cement concrete. (reaffirmed 2007)
6909-1990	Specification for super sulphate cement (Amendment No. 1,2,3 & 4) (reaffirmed 2005)
7861-(Pt-1)- 1981	Code of practice for extreme weather concreting part-1 hot weather. (reaffirmed 2007)
8041-1990	Specification for rapid hardening Portland cement (First Revision) (Amendment No. 1, 2,3 & 4). (reaffirmed 2005)
8112-1989	Specification for 43 Grade ordinary Portland cement (Amendment No. 1, 2,3,4,5, & 6). (reaffirmed 2005)
9103-1999	Specification for admixture for concrete. (reaffirmed 2006)
IRC-21-2000	Standard Specification & code of practice for road bridges.
SP-23-1982	Hand-book on concrete mixes base down Indian Standard (with amendment No. 1).
SP-24-1983	Explanatory hand-book in Indian Standard Code for plain & rain forced concrete (IS-456-1978). Specification for road bridge work (By Ministry of Shipping and Transport road wing). Concrete manuum {U.S. Department of the interior water and power resources service} Report on committee on cost control river valley project- volume-III, January- 1981(Government of India-Ministry of Irrigation).

Item No.	Item	Unit	Rate	Remarks
1601	Providing and placing in position M-20 R.C.C excluding cost of reinforcement, form work, but including vibration, finishing, curing and cleaning etc., complete with graded, metal of maximum size-			
	(a) 40 mm	cum	3239.00	
	(b) 20 mm	cum	3353.00	
	(c) 12.5 mm	cum	3344.00	
1602	Providing and placing in position M-15 R.C.C excluding cost of reinforcement, form work but, including vibration, finishing, curing and cleaning etc., complete with graded ,metal of maximum size-			
	(a) 40 mm	cum	2832.00	
	(b) 20 mm	cum	2897.00	
	(c) 12.5 mm	cum	2887.00	
1603	Providing and placing in position M-10 R.C.C excluding cost of reinforcement, form work but cleaning etc. complete with graded metal of maximum size-			
	(a) 40 mm	cum	2372.00	
	(b) 20 mm	cum	2440.00	
1604	Providing and laying design mix reinforcement cement concrete with crushed graded stone aggregate 20mm nominal size using batching plant, transit mixer and concrete pump, in all works excluding cost of reinforcement and form work.			
	(a)Concrete mix M - 20	cum	3211.00	
	(b)Concrete mix M - 25	cum	3318.00	
	(c)Concrete mix M - 30	cum	3372.00	
	(d)Concrete mix M - 35	cum	3416.00	
	(e)Concrete mix M - 40	cum	3453.00	
1605	Labour only for maximum in mixer, laying, vibration, finishing, curing and cleaning-			
	(a) Items 1601 and 1603	cum	474.00	
1606	Extra for each additional floor or every additional 3 m or part thereof for R.C.C and P.C.C work in superstructure.	cum	70.00	

Item No.	Item	Unit	Rate	Remarks
1607	Shuttering for reinforced concrete in foundation, column footing etc. including all leads and lifts for all materials.	sqm	126.00	
1608	Form work for R.C.C. in-situ, thickness not exceeding 20cm, for slabs, lintels, beams, columns, etc. including all leads and lifts for all materials-			
	(a) Up to 1.5 m height	sqm	164.00	
	(b) Add for every additional 1.5m or part thereof above 1.5m height.	sqm	24.00	
1609	Form work for P.C.C work in-situ, thickness not exceeding 1 m, including all leads and lifts for all materials-			
	(a) Up to 1.5 m height	sqm	164.00	
	(b) add for every additional 1.5m, or part thereof above 1.5m height.	sqm	24.00	
1610	Labour only for assembling, erection and dressing with oil as leansing of form work including subsequent removal-			
	(a) Item 1607	sqm	38.00	
	(b) Item 1608 and 1609	sqm	50.00	
1611	Add in Item 1608 for thickness-			
	(a) 20 to 30 cm	sqm	69.00	
	(b) 30 to 60 cm	sqm	132.00	
	(c) over 60 cm	sqm	198.00	
1612	Add in 1609 for thickness exceeding 1 m.	sqm	77.00	
1613	Form work for precast reinforced or plain cement concrete work including all leads and lifts for all materials.	sqm	49.00	
1614	Labour only for assembling, erection and dressing with oil for cleansing of form worm.	sqm	30.00	
1615	Add in 1608 and 1609 for form work of cornices, curved moulding, staircases, circular columns, posts and struts, arches, well staining, cut and ease.	sqm	10% extra	
1616	Extra rate for form work for propping from lower floor upwards at the time of execution of upper floors in the multistoried building.	sqm	13.00	
1617	Centering with earth or moorum including watering ramming and its removal.	cum	162.00	

Item No.	Item	Unit	Rate	Remarks
1618	20 mm thick lime plaster in lime mortar 1:2 for surfacing of centering including ramming etc. complete.	sqm	13.00	
1619	Labour only for item 1618	sqm	13.00	
1620	20 mm thick mud plaster surfacing of centering including ramming etc. complete.	sqm	62.00	
1621	Providing cold drawn wire STEEL FIBER (flat/round/crimped) for mechanically mixing in all grades of concrete confirming to IS 280-1978, 1387-1967, steel fibers confirm to ASTM designation A820-96, chemical composition and mechanical properties of wire should confirm to IS 7887-1975, IS 1521-1972, IRC SP 46-1997 and ISO 9002 manufactured. The tensile strength minimum 3.45 Mpa, 1.25-80 mm mm., thickness /diameter 0.5-0.9 mm., height 2.0-2.5 mm., width 2.3-2.77 mm., aspect ratio 50-70 and withstand bent around 3.18 m. inside diameter to 90 degree angle at 16 degree centigrade without break. Rate is inclusive of all taxes and cost of manufacturing, packing and transportation.	kg	78.00	

CHAPTER 17 – WHITE WASHING, COLOUR WASHING AND DISTEMPERING

Notes :-

1. Rates include- (a) All lead and lift for all materials ;
 (b) Removing nails and making good holes, cracks, patches, etc., not exceeding 0.1 sqm. each materials similar in composition to the surface to be prepared;
 (c) Removing cakes and scales of wash but not distemper;
 (d) Cost of all scaffoldings and ladders (in case of completed items).
 (e) Cost of cans, brushes, and other appliances required for the execution of work;
 (f) Thoroughly brooming the surface to remove all dirt, dust, mortar drops and other foreign matter; and
 (g) Protection of all places and things needing protection, cleaning by approved method, removing all stains, smears, splashing and droppings of every kind, from floors, glazing, furniture's, etc.
 (h) Curing to ensure complete hydration of cement base.
2. Before starting the distemper/oil bound distemper/painting etc, the contractor must get the brand and quality approved by the Engineer-in-Charge, bring the full quantity of approved brand and quality required for the work and remove the empty containers only after the work is measured and checked.
3. (a) For oil bound distempering prior written permission of the Executive Engineer is required.
 (b) For plastic emulsion water proofing cement paint (snocem or durocem) prior written permission of the Chief Engineer/ Superintending Engineer is required.
4. Measurements:- (i) Dimension shall be measured correct to the nearest cm the area shall be calculated in sqm correct to two places of decimal.
 (ii) For jambs, soffits, sills, etc., for openings not exceeding 0.5 sqm each in area; for ends of joists, beams, posts, girders, steps etc. not exceeding 0.5 sqm in area; and for openings exceeding 0.5 sqm and not exceeding 3 sqm in area, deductions and additions shall be made in the following manner.
 - (a) No deduction shall be made for ends of joists, beams, etc. and opening not exceeding 0.5 sqm each and no addition shall be made for reveals, jambs, soffits, sills of these openings for the finish around ends of joists, beams, posts, etc.
 - (b) Deductions for opening exceeding 0.5 sqm but not exceeding 3 sqm each shall be made for reveals, jambs, soffits, sills etc., of these openings :-
 - (1) When both faces of wall are provided with the same finish, deduction shall be made for one face only.
 - (2) When each face of wall is provided with a different finish, deduction shall be made for that side on which width of reveal is less than that of the other side

but no deduction shall be made on the other side; where widths of reveals on both faces of wall are equal, deduction of 50 percent of area of opening of each face shall be made from area of finish.

(3) When only one face is treated and other face is not treated, full deduction shall be, made if width of reveal on the treated side is less than that on the untreated side, but if width of reveal is equal or more than that on the untreated side, neither deduction for the opening nor addition for reveals, jambs soffitt, sills, etc., shall be made.

(4) When width of door frame is equal to thickness of wall or is projecting beyond the thickness of wall, full deduction for opening shall be made from each face of wall.

(iii) In case of openings of areas above 3 sq.m. each, deductions shall be made for openings, but jambs, soffits, and reveals shall be measured.

(iv) No deduction shall be made for attachments, such as casings, conduit, pipes, electric wiring and the like.

(v) Corrugated surfaces shall be measured flat as fixed and not girthed. Quantities so measured shall be increased by the following percentages and the resultant shall be included in general areas:

(a) Corrugated steel sheets	14%
(b) Corrugated asbestos cement sheets	20%
(c) Semi-corrugated asbestos cement sheets	10%

(vi) Comics and other wall features when not picked out in a different finish / colour, shall be girthed and included in general area.

5. Water proof cement paint including curing: - All products manufactured as per Bureau of Indian Standards with various brands names shall be admissible. BIS No. 5410 – 1994 and ISO 9002-1999 may be referred in this connection.

The following Indian standards may be referred to:

IS No.	Title
44-1991	Iron oxide pigments for paints (Amendment No.1) (first revision) (Reaffirmed 2002)
55-1970	Ultramarine blue for paints (first revision) (Amendment No. 1) (reaffirmed 2002).
253-1985	Edible common salt (third revision) (Reaffirmed 2004)
261-1982	Copper sulphate (second revision) (with amendment No. 1) (Reaffirmed 2006).
427-1965	Distemper, dry, colour as required (Revised) (amendment No.1 to 3) (Reaffirmed 1986).
428-2000	Distemper, oil emulsion, colour as required (first revision) (with amendment No. 1&2) (Reaffirmed 1986).
712-1984	Building Lime (third revision). (Reaffirmed 2000)

797-1982	Common salt for chemical industries (third revision) (Amendment No.1) (Reaffirmed 1997).
852-1994	Animal glue for general wood working purposes (first revision) (Amendment No.1) (Reaffirmed 1999)
1477 (Pt.-II) 1971	Painting of ferrous metal in buildings : Painting (second revision)
2395 (Pt.-I) 1994	Operations and workmanship for painting, concrete, masonry and plaster surfaces. (Reaffirmed 2005)
5410-1992	Cement paint, colour as required (with amendment No.1 to 3) (reaffirmed 1999)
5411	Plastic emulsion paint -
5411 (Pt-I) 1974	Part I – For interior use. (Reaffirmed 1993)
5411 (Pt-II) 1972	Part II – For exterior use. (Reaffirmed 1993)
6278-1971	Code of practice for white washing and colour washing (Reaffirmed 2006).

Item No.	Item	Unit	Rate	Remarks
1701	White washing with lime (one coat)	sqm	2.10	
1702	White washing with lime (two coats)	sqm	3.60	
1703	White washing with lime (three coats)	sqm	6.00	
1704	White washing with chalk whiting (one coat)	sqm	2.40	
1705	White washing with chalk whiting (two coats)	sqm	4.20	
1706	White washing with chalk whiting (three coats)	sqm	6.90	
1707	Labour only for items 1701 and 1704	sqm	1.50	
1708	Labour only for Item No. 1702 & 1705	sqm	2.50	
1709	Labour only for item No 1703 & 1706	sqm	4.40	
1710	Cement washing with portland cement slurry (one coat)	sqm	3.00	
1711	Labour only for item No. 1710	sqm	2.40	
1712	Colour washing over priming and including a primary coat of white washing (one coat)	sqm	3.20	
1713	Colour washing over and excluding the priming coat of white washing (one coat)	sqm	2.40	
1714	Colour washing over and including a priming coat of white washing (two coats)	sqm	5.60	

Item No.	Item	Unit	Rate	Remarks
1715	Colour washing over and excluding priming coat of white washing (two coats).	sqm	5.40	
1716	Labour only for item 1712	sqm	2.20	
1717	Labour only for item 1713	sqm	0.80	
1718	Labour only for item 1714	sqm	3.90	
1719	Labour only for item 1715	sqm	2.50	
1720	Distempering with dry distemper excluding a priming coat of whiting (one coat)	sqm	9.80	
1721	Distempering with dry distemper over and including priming coat of whiting (two coats).	sqm	20.90	
1722	Distempering with dry distemper excluding priming coat (two coats).	sqm	10.60	
1723	Distempering with oil bound washable distemper excluding priming coat (one coat).	sqm	21.40	
1724	Distempering with oil bound washable distemper (two coats) including priming.	sqm	44.20	
1725	Distempering with oil bound washable distemper excluding priming coat (two coats).	sqm	38.30	
1726	Labour only for item 1720	sqm	4.40	
1727	Labour only for item 1721	sqm	15.20	
1728	Labour only for item 1722	sqm	5.10	
1729	Labour only for item 1723	sqm	8.70	
1730	Labour only for item 1724	sqm	18.90	
1731	Labour only for item 1725	sqm	14.50	
1732	Water proofing cement paint including curing (one coat).	sqm	20.60	
1733	Water proofing cement paint (two coats).	sqm	38.50	
1734	Labour only for item 1732	sqm	8.70	
1735	Labour only for item 1733	sqm	13.00	
1736	Applying one coat of cement primer on wall surface	sqm	16.40	

CHAPTER 18 – PAINTING

Notes :-

1. Rates Include-(a) All scaffoldings, ladders, paints, cans, brushes and other appliances required for the efficient execution of work.
 - (b) Conveyance, delivery, handling unloading, storing, waste, protective cover and cleaning stains from floors walls, glass panes etc.
 - (c) Preparatory work, such as knotting, priming stopping and rubbing down burning off or stripping.
2. Paints will be supplied departmentally and the work shall be done on labour rates unless otherwise ordered by the Executive Engineer.
3. Paints, oils, varnishes etc. of approved brand and manufacture shall be used. Ready mixed paints as received from the manufacturer without any admixture shall be used. If for any reason, thinning is necessary in case of ready mixed paint, the brand of thinner recommended by the manufacturer or as decided by the Engineer-in-Charge shall be used.
4. Approved paints, oils or varnishes shall be brought to the site of work by the contractor in their original container in sealed condition the materials shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work.
5. The canal (and Dam) gates may be coated with 0.254 mm. thick film of cashew nut shell liquid, (CNSL) epoxy-coal tar pitch paint (I.P. No. 127126 patented by the Research Designs and Standard Organisation, Ministry of Railways, which has life expectancy of 15 years. Surface which have been cleaned to bare metal should be primed (with one coat of red oxide zine chromate priming) within 4 hours. The primer should be allowed to dry thoroughly before application of first coat of CNSL epoxy-coal tar pitch paint and twelve hours should be allowed before application of each of the subsequent coats.
6. Items 1854 and 1858 shall not be executed without prior sanction of the Chief Engineer/Superintending Engineer.
7. Measurements – (a) Dimensions shall be measured correct to the nearest cm. The area shall be calculated in the sq.m. correct to two places of decimal.
 - (b) No deduction shall be made for openings not exceeding- 0.5 sqm each, and no addition shall be made for painting to beading, moulding, edges, jambs, soffits, sills etc, of such openings.
 - (c) Corrugated sheet surfaces shall be included with plain surfaces after increasing their areas by the following percentages -

(i)	Corrugated sheets	14 per cent.
(ii)	Asbestos cement sheets corrugated	20 per cent.
(iii)	Asbestos sheets, semi-corrugated	10 percent.
 - (d) Areas of uneven surfaces shall be converted into equivalent plain areas in accordance with table given below.

Table of Equivalent Plain Areas of Uneven Surfaces

Sl. No.	Description of work	How measured	Multiplying factor
(i)	Panelled or framed and braced or ledged and battened or ledged, battened and braced joinery.	Measured flat (not girthed) including chawkhat or frame. Edges, chocks, cleats etc., shall be deemed to be included in this item.	1.30 (for each side)
(ii)	Flush joinery	do	1.20 (for each side)
(iii)	Fully glazed or gauged	do	0.80 (for each side)
(iv)	Partly panelled and partly glazed or gauged joinery	do	1 (for each side)
(v)	Fully venetianed or louvered joinery.	do	1.80 (for each side)
(vi)	Weather boarding	Measured flat (not girthed) supporting frame work shall not be	1.20 (for each side)
(vii)	Wood Shingle roofing	Measured flat (not girthed)	1.10 (for each side)
(vii)	Wood shingle roofing	Measured flat (not girthed)	1.10 (for each side)
(viii)	Boarding with cover fillets and match Boarding	do	1.05 (for each side)
(ix)	Tile and slate battening	Measured flat overall no deduction shall be made for open spaces.	0.80 (for painting all over).
(x)	Trellis (or Jaffrey) work one way or two way	Measured flat overall no deduction shall be made for open spaces supporting members shall not be measured separately.	1.00 (for painting all over).
(xi)	Guard bars balustrades gales gratings grills, expanded metal and railings	do	1.00 (for painting all over).
(xii)	Gates and open palisade fencing including standard braces, rails stays etc.	do	1.00 (for painting all over)
(xiii)	Carved or enriched work	Measured flat	2.00 (for each side)
(xiv)	Steel roller shutters	Measured flat (size of opening) overall, jamb guides, bottom rails and locking arrangement, etc., shall be included in the item (top cover shall be measured separately).	1.10 (for each side)

Sl. No.	Description of work	How measured	Multiplying factor
(xv)	Plain sheet steel doors and windows.	Measured flat (not girthed) including frame, edges, etc.	1.10 (for each side)
(xvi)	Fully glazed or gauged steel	do	0.50 (for each side)
(xvii)	Partly Panelled and partly glazed steel doors	do	0.80 (for each side)
(xviii)	Collapsible gate	Measured flat (size of opening)	1.50 (for painting all over).

Explanatory Notes

1. For S. No. (xii) the height shall be taken from bottom of lowest rail, of palisades do not go below it or from lower end of palisades, if they project below lowest rate, up to top of palisades, but not up top of standards, if they are higher than palisades.
2. Where doors, windows, etc., are of composite types other than in those included in this table, different portions shall be measured separately with their appropriate multiplying factors, centre line of common rail being taken as the dividing line between the two portions.
3. Measurement of painting of doors, windows, collapsible gates, rolling shutters etc. as given in this table shall be deemed to include painting, if required, of all iron fittings in the same shade.
4. When two faces of a door, window etc., are to be treated with different specified finishes, measurable under separate items, edges of frames and shutters shall be treated with one or the other type of finish and measurement there of shall be deemed to be included in measurement of the face treated with that finish.
5. (a) The painting of spillway, sluice, canal gates, stop logs and other components / assemblies / machinery/ structures etc. exposed to water and exposed embedded parts should be done strictly in accordance to IS code 14177-1994.
 (b) Prior to painting the surface, preparation should be done as per IS Code 14177-1994 Para 4.2.1, 5.2.1.1, 5.2.2.1, 5.2.3. In case of maintenance operation, the surface preparation should be done as per Para 7.00 of IS 17144-1994.
 (c) For primer and finishing coat, the painting work should be carried out strictly as per Para 5.2.1.2, 5.2.1.3, 5.2.2.2 and 5.2.2.3 of IS Code.
 (d) Painting should be done invariably using airless spray equipments as per IS: 14177 – 1994 wherever recommended.
 (e) Proper care should be taken for deciding the compatibility of primer paint with paints used for finishing coats, including thinner on the basis of manufacturer's recommendation.
6. Item 1854 to 1858 shall not be executed without prior approval of the concerned Chief Engineer.

7. The Indian Standard Colour Numbers are given below :-

101	Sky blue	102	Turquoise blue
103	Peacock blue	104	Azure blue
105	Oxford blue	106	Royal blue
169	Traffic blue	174	Oriental blue
216	Eau-de-nil	217	Sea green
218	Grass green	219	Sage green
220	Olive green	221	Brilliant green
222	Light bronze green	223	Middle bronze green
224	Deep bronze green	225	Light Brunswick green
226	Middle Brunswick green	227	Deep Brunswick green
267	Traffic green	275	Opaline green
278	Light Olive green	279	Steel furniture grey
280	Verdigris green	281	Apple green
283	Aircraft grey green	209	Canary yellow
362	Pale Cream	353	Deep cream
354	Prim rose	355	Lemon
356	Golden yellow	358	Light buff
359	Middle Buff	360	Deep buff
361	Light stone	362	Middle stone
363	Dark stone	364	Portland stone
365	Vellum	368	Traffic yellow
384	Light straw	385	Light biscuit
386	Beige	397	Jasmine yellow
410	Light brown	411	Middle brown
412	Dark brown	413	Nut brown
414	Golden brown	442	Light salmon pink
443	Salmon pink	444	Terra cotta
445	Venetian red	446	Red oxide
448	Deep Indian Red	449	Light purple brown
451	Chocolate	473	Gulf red
536	Fire red	537	Signal red
538	Post office red	540	Crimson
541	Maroon	557	Light orange
570	Traffic red	574	Indian Saffron
628	Silver grey	629	Quaker grey
630	French grey	631	Light grey
632	Dark Admiral grey	633	RAF blue grey
634	Slate	635	Lead
692	Smoke grey	693	Air craft grey
694	Dove grey	697	Light admiral grey

8. The following Indian Standards may be referred to:-

IS No.	Title
16(Pt.-I) 1991	Hand made shellac (second revision) (Amendment No.1 to 3) (Reaffirmed 2003)
16(Pt.-II) 1991	Machine made shellac (second revision) (Amendment No. 1 to 3) (Reaffirmed 2003)
75-1973	Linseed Oil, and refined (second revision) (with amendment No.1) (reaffirmed 2006)
77-1976	Linseed oil, boiled, for paints (second revision). (Reaffirmed 2006)
102-1962	Ready mixed paint, brushing red lead, setting priming (revised) (with amendment No.1) (reaffirmed 1977) (Reaffirmed 1996)
104-1979	Ready mixed paint, brushing, zinc. Chrome, priming (second revision) (with amendment No.1) (reaffirmed 2004)
109-1968	Ready mixed paint, brushing, priming, plaster, to Indian Standard Colour No. 361 light stone and NO.631 Light grey first revision) (with amendment No.1) (reaffirmed 1976).
110-1983	Ready mixed paint, brushing grey filler, for enamels for use over primers (second revision).
133-2004	Enamel, interior (a) under coating, (b) finishing (third revision).
137-1965	Ready mixed paint, brushing matt or egg-shell, flat, finishing interior to Indian standard colour as required (revised) (with amendment No.1) (reaffirmed 1999).
158-1981	Ready mixed paint, brushing, bituminous, black lead free, acid, alkali and heat resisting (third revision) (Amendment No.1). (Reaffirmed 1999)
218-1983	Creosote oil for use as wood preservative (second revision) (Reaffirmed 1998)
290-1961	Coal tar black paint (revised) (reaffirmed 1996)
324-1959	Ordinary denature sprite (revised) (with amendment No.1) (Reaffirmed 2002)
337-1975	Varnish, finishing, interior (first revision) (reaffirmed 2001)
340-1978	Varnish, mixing (first revision)
341-1973	Black Japan, types A,B, and C (first revision) (reaffirmed 2002)
345-1952	Wood filler, transparent, liquid (with amendment Nos. 1 and 2) (reaffirmed 1986)
347-1975	Varnish shellac for general purposes (first revision) (reaffirmed 2001)
348-1968	French polish (first revision) (with amendment Nos.1) (reaffirmed 2001).
384-2002	Bushes, paints & varnishes, flat (fourth revision)
423-1961	Plastic wood for joiners fillers (revised) (with amendment No. 1) (reaffirmed 2001)
430-1972	Paint remover, solvent type, non-flammable (second revision) (reaffirmed 1999)

486-1983	Brushes, sash tool, for paints & varnishes (third revision) (reaffirmed 1998)
487-1997	Brush, paint and varnish (i) oval, ferrule bound and (ii) round, ferrule bound (fourth revision)
524-1983	Varnish, finishing, exterior, synthetic, air drying (second revision). (Reaffirmed 2005)
525-1968	Varnish, finishing, exterior and general purposes (first revision) (with amendment No.1) (reaffirmed 2001)
533-1998	Gum spirit of turpentine (oil of turpentine) (revision) (with amendment Nos. 1 and 2) (reaffirmed 1978)
1103-1984	Brushes artist's (second revision) (with amendment No.1) (Reaffirmed 2003)
1104-1984	Brushes, lettering (lettering) (reaffirmed 2003)
1303-1983	Glossary of terms relating to paints (second revision) (Reaffirmed 2001)
1407-1980	Round paint tins (second revision) (Reaffirmed 1987)
1477 (Pt.-I) 1971	Code of practice for painting of ferrous metals in buildings : Pretreatment (First Revision) (reaffirmed 1979)
1477 (Pt.-II) 1971	Code of practice for painting of ferrous metal in buildings : Painting (First revision) (Reaffirmed 1979)
2074-1992	Ready mixed paint, air drying, red oxide-zinc chrome priming (first revision) (with amendment No.1 to 4) (Reaffirmed 2002)
2338 (Pt.-I) 1967	Code of practice for finishing of wood and wood based materials : Operations and workmanship (Reaffirmed 2000)
2338 (Pt.-II) 1967	Code of practice for finishing of wood and wood based materials Schedules. (Reaffirmed 2000)
2339-1963	Aluminum paint for general purposes, in dual container (with amendment No.1 & 2) (reaffirmed 2004).
2395 (Pt.-I) 1994	Code of practice for painting concrete , masonry and plaster surfaces : Operations and workmanship (Reaffirmed 2005)
2395 (Pt.-II)- 1994	Code of practice for painting concrete, masonry and plaster surfaces : Schedules (Reaffirmed 2005)
2524 (Pt -I)- 1968	Code of practice for painting of non-ferrous metals in buildings: Pretreatment. (Reaffirmed 2000)
2.524 (Pt-II)- 1968	Code of practice for painting of non-ferrous metals in buildings: Painting. (Reaffirmed 2000)
2552-1989	Steel drums (second revision) (Reaffirmed 2006)
2631-1976	Isopropylalcohol (first revision) (Reaffirmed 2005)
2932-2003	Enamel, synthetic, exterior (a) under coating (b) finishing (third revision) (with amendment No. 1 & 2)
2933-1975	Enamel, exterior (a) under coating, (b) finishing (first revision) (with amendment No. 1&2) (Reaffirmed 2001)
3140-1965	Code of practice for painting asbestos cement building products. (Reaffirmed 2000)

3536-1999	Ready mixed paint, brushing, wood primer, pink (with amendment No. 1 to 4)
3585-1966	Ready mixed paint, aluminum, brushing, priming water resistant for wood work (with amendment No.1) (reaffirmed 1999).
5411 (Pt-I)-1974	Plastic emulsion paint for interior use (first revision) (with amendment No.1) (reaffirmed 1993)
5660-1998	Ready mixed paint, brushing aluminum red oxide primer (reaffirmed 1998).
6005-1998	Code of practice for phosphating of iron and steel (reaffirmed 1979).
S.P. 1650-1973	Standard colours for buildings decorative finishes (with supplement) (reaffirmed 1979). Standard Specifications – 1977 of “National Building Organisation” Specification – 1977 of “Central Public – Works Department” volume one.
14177-1994	Guide lines for painting system for hydraulic gates and hoists (Reaffirmed 1999).

9. The time interval for painting of dams and canal gates etc. shall be normally five to seven years, but if the condition of painting deteriorates on account of frequent operations of the opening and closing of gates in every season, the painting work can be taken up earlier also to save the gate and ancillary steel structure with the prior approval of concerned Chief Engineer.
10. For gates, structures, machinery etc. separate rates are worked out for works
- (i) Up to 1.5 m height
 - (ii) Beyond 1.5 m height
for items 1854, 1855, 1856, 1875 & 1858 etc.

It is intended that the rates up to 1.5 m height shall be payable where work is executed without the use of scaffolding etc. are used for the execution of the work. The measurement of height shall be taken from the sill level of gates, the place where component or job is situated or placed e.g. ground level deck, bridge etc.

Item No.	Item	Unit	Rate	Remarks
1801	Priming coat with ready mixed paint brushing, wood primer, pink (IS: 3536-1966) on new wood work (hard or soft wood) including preparing the surface	sqm	19.00	
1802	Priming coat with ready mixed paint aluminum brushing, priming water resistant for wood work (IS:3585-1966) on resinous wood and plywood surface including preparing the surface	sqm	17.00	
1803	Priming coat with ready mixed paint brushing Zinc chrome, priming (IS: 104-1979) on new steel/ galvanised iron surfaces including preparing the surface.	sqm	21.00	

Item No.	Item	Unit	Rate	Remarks
1804	Cost of items 1801 to 1803 excluding the cost of primer.	sqm	7.00	
1805	Labour only for items 1801 to 1803	sqm	7.00	
1806	Painting two or more coats (excluding priming coat) on new surfaces with ready mixed paint of approved brand and manufacture in all shades to give an even shade.	sqm	41.00	
1807	Painting one or more coats on previously painted surfaces with ready mixed paint of approved brand and manufacture in all shades to give an even shade.	sqm	26.00	
1808	Painting two or more coats (excluding priming coat) on new surfaces with enamel paint (IS: 2933-1975) to give an even shade.	sqm	34.00	
1809	Painting one or more coats on previously painted surfaces with enamel paint (IS: 2933-1975) to give an even shade.	sqm	22.00	
1810	Painting two or more coats (excluding primer) on G.S. sheets with ready mixed paint of approved brand and manufacture to give an even shade.	sqm	33.00	
1811	Painting one or more coats on previously painted surfaces of G.S. sheets with ready mixed paint of approved brand and manufacture to give an even shade.	sqm	20.00	
1812	Painting two or more coats (excluding priming coat) with aluminum paint (IS: 2339-1963) on new surfaces to give an even shade.	sqm	33.00	
1813	Painting one or more coats with aluminum paint (IS: 2339-1963) on previously painted surfaces to give an even shade.	sqm	21.00	
1814	Painting two or more coats with anti corrosive ready mixed paint brushing bituminous black paint (IS: 158-1981) on new surfaces to give an even shade.	sqm	24.00	
1815	Painting one or more coats with anit-corrosive ready mixed paint, brushing (IS 158-1981) bituminous black paint on previously painted Surfaces to given an even shade.	sqm	15.00	

Item No.	Item	Unit	Rate	Remarks
1816	Painting two or more coats with synthetic enamel paint (IS: 1932-1974) on new surfaces to give an even shade over an under coat of suitable shade with ordinary paint of approved brand and manufacture (excluding the cost of under coat with ordinary paint).	sqm	55.00	
1817	Painting one or more coats with synthetic enamel paint (IS: 2932-1974) on previously painted surfaces in all shades to give an even shade.	sqm	34.00	
1818	Wall painting two or more coats (excluding priming coat) on new surface with plastic emulsion paint (IS: 5411 –Pt-I) to give an even shade.	sqm	56.00	
1819	Wall painting two or more coats (excluding priming coat) on previously painted surface with plastic emulsion paint (IS: 5411-Pt.I) to give an even shade.	sqm	35.00	
1820	Painting one or more coats with black Japan paint (type B) IS: 341-1973, to give an even shade.	sqm	22.00	
1821	Varnishing one or more coats with clear synthetic varnish IS: 524-1968.	sqm	25.00	
1822	Varnishing one or more coats with copal varnish IS: 337-1975.	sqm	22.00	
1823	Cost of items 1806, 1808, 1810, 1812, 1814, 1816 and 1818 excluding the cost of paint.	sqm	16.00	
1824	Labour only for items 1806, 1808, 1810, 1812, 1814, 1816 and 1818	sqm	15.00	
1825	Cost of items 1807, 1809, 1811, 1813, 1815, 1817, 1819 and 1820 excluding the cost of paint.	sqm	10.00	
1826	Cost of items 1821 and 1822 excluding the cost of varnish.	sqm	10.00	
1827	Labour only for items 1807, 1809, 1811, 1813, 1815, 1817, 1819 to 1822.	sqm	10.00	
1828	Painting two or more coats with oil type wood preservative (IS: 218-1961) on new surfaces of wood work.	sqm	20.00	
1829	Cost of Item 1828 excluding the cost of wood preservative.	sqm	5.00	

Item No.	Item	Unit	Rate	Remarks
1830	Labour only for item 1828	sqm	4.00	
1831	Painting one or more coats with oil type wood preservative (IS: 218-1961) on previously painted surfaces of wood work.	sqm	16.00	
1832	Cost of item 1831 excluding the cost of wood preservative.	sqm	4.00	
1833	Labour only for item 1831	sqm	3.00	
1834	Painting two coats of coal tar (IS: 290-1961) on new surfaces using 0.16 and 0.12 liter of coal tar per sq.m. in the first and second coat respectively.	sqm	15.00	
1835	Cost of items 1834 excluding the cost of coal tar.	sqm	6.00	
1836	Labour only for item 1834	sqm	5.00	
1837	Painting one coat of coal tar (IS 290-1961) on previously painted surfaces using 0.12 liter of coal tar per sq.m.	sqm	9.00	
1838	Cost of item 1837 excluding cost of coal tar	sqm	5.00	
1839	Labour only for item No. 1837	sqm	5.00	
1840	Oiling two or more coats with raw linseed oil (IS : 75-1973) on new surfaces.	sqm	24.00	
1841	Cost of item 1840 excluding the cost of linseed oil.	sqm	7.00	
1842	Labour only for item No. 1840	sqm	5.00	
1843	Oiling one or more coats with raw linseed oil (IS:75-1973) on previously painted surface.	sqm	16.00	
1844	Cost of item 1843 excluding the cost of linseed oil.	sqm	6.00	
1845	Labour only for item 1843	sqm	5.00	
1846	French spirit, polish, two or more coats (IS: 348-1968) including cost of wood filler on new wood based surface.	sqm	84.00	
1847	Labour only for item 1846	sqm	37.00	
1848	French spirit polish, one or more coats (IS:348-1968) on previously painted surfaces including a coat of wood based surface	sqm	41.00	
1849	Labour only for Item No. 1848	sqm	20.00	

Item No.	Item	Unit	Rate	Remarks
1850	Polishing on wood work with ready made was polish of approved brand and manufacture on new surface.	sqm	37.00	
1851	Labour only for Item No. 1850	sqm	22.00	
1852	Polishing on wood work with ready made wax polish of approved brand and manufacture on previously painted surface.	sqm	19.00	
1853	Labour only for item no. 1852.	sqm	11.00	
1854	<p>Painting of spillway gates, sluice gates, canal gates (both vertical or radial) stop logs, exposed embedded parts and all unmachined ferrous surfaces (hoist cylinder, cylinder heads, hydraulic piping, pipe fittings, bonnet covers), exposed to water, as per IS 14177-94, for which surface preparation by blast cleaning of Class "B", primer coat (one coat) of inorganic Zinc silicate (preferable airless spray) or alternatively, two coats of zinc rich primer (containing not less than 85% zinc on dry film), to give dry film thickness of 70 ± 5 microns and finish coat (two coats) of solvent less coal tar epoxy paint, using airless spray, to provide dry film thickness of 150 ± 5 microns per coat.</p> <p>Thus, total dry film thickness of all the coats, including primer coating, should not be less than 350 microns. This will include expenses on mobilisation & demobilisation of equipments.</p> <p>For maintenance painting, the surface preparation shall be done by appropriate hand and power tool cleaning. Prior to hand and power tool cleaning, any heavy layer of rust should be removed by chipping. Visible oil, grease, dirt and other foreign material be cleaned using solvents like clean mineral spirits xylol or white gasoline. After hand and power tool cleaning, the surface should be cleaned of loose dust and debris and / or blast cleaned as laid down in Para 7.0 of IS Code 14177-1994. After the surface preparation, the primer and finishing coats shall be carried out as provided above for painting.</p>	sqm		
	(i) Up to 1.5 m height	sqm	605.00	

Item No.	Item	Unit	Rate	Remarks
	(ii) Beyond 1.5 m height	sqm	620.00	
	Note: - The rates for item 1854 (i) & (ii) are applicable only for installed gates etc. For painting of non-installed gates etc., the rates mentioned in 1854 (i) shall be applicable			
1855	Painting of lifting beam/ lifting tackles as per IS: 14177-1994, for which surface preparation by blast cleaning as per class "C" or class "B", primer coat (two coats) of zinc phosphate primer, to provide dry film thickness of 40 microns per coat and finish coat (two coats) of alkyd based micaceous iron oxide paint, using airless spray, to provide minimum dry film thickness of 65 ± 5 microns per coat, at an interval of 24 hours. Thus, total dry film thickness of all the coats, including primer coating, should not be less than 200 microns. This will include expenses on mobilization and demobilization of equipment's.			
	For maintenance painting, the surface preparation shall be done by appropriate hand and power tool cleaning, Prior to than and power tool cleaning any chipping. Visible oil, grease, dirt and other foreign material be cleaned using solvents like clean mineral spirits, xylol or white gasoline. After hand and power tool cleaning, the surface should be cleaned of loose dust and debris and / or blast cleaned as laid down in Para 7.0 of IS Code 14177-1994. After the surface preparation the primer and finishing coats shall be carried out as provided above for painting.			
	(i) Up to 1.5 m height	sqm	268.00	
	(ii) Beyond 1.5 m height	sqm	282.00	
	Note: - The rates for item 1855 (i) & (ii) are applicable only for installed machinery, For non-installed machineries etc., the rates mentioned in 1855 (i) shall be applicable.			
1856	Painting of structural components of hoist including supporting structures and surfaces of hydraulic hoists unexposed to water as per IS:14177-1994, for which surface preparation by blast cleaning of class 'B', primer coat (two coats) of Zinc phosphate primer to give dry film thickness			

Item No.	Item	Unit	Rate	Remarks
	<p>of 40 ± 5 microns per coat and finish coat (one color) of alkyd based micaceous iron oxide paint to give dry film thickness of 65 ± 5 microns followed by two coats of synthetic enamel paint, using airless spray, to give dry film thickness of 25 ± 5 microns per coats, at an interval of 24 hours. Thus, total dry film thickness of all the coats, including primer coating, should not be less than 175 microns. This will include expensed on mobilisation and demobilisation of equipments.</p> <p>For maintenance painting, the surface preparation shall be done by appropriate hand and power tool cleaning. Prior to hand and power tool cleaning, any heavy layer of rust should be removed by chipping. Visible oil, grease, dirt and other foreign material be cleaned using solvents like clean mineral spirits, xylol or white gasoline. After hand and power tool cleaning, the surface should be cleaned of loose dust and debris and / or blast cleaned as laid down in Para 7.0 of IS code 14177 – 1994. After the surface preparation, the primer and finishing coats shall be carried out as provided above for painting.</p>			
	(i) Up to 1.5 m height	sqm	264.00	
	(ii) Beyond 1.5 m height	sqm	277.00	
	<p>Note: - The rates in item 1856 (i) & (ii) are applicable only for installed components / structures etc. For non-installed components structures rates mentioned in 1856 (i) shall be applicable.</p>			
1857	<p>Painting of machinery, including gearing, housing, shafting, bearing, pedestals, oil tanks, control cabinets, hoist beams, pipe support, clams, ladders etc., of hoists and supporting structures, as per IS 14177-1994, for which surface preparation by blast cleaning of class 'B' Primer coat (one coat) of Zinc phosphate paint to give a minimum dry film thickness of 50 ± 5 microns and finish coat (three coats) of aluminum paint to synthetic enamel paint, using airless spray, to provide a dry film thickness of 25 ± 5 microns per coat. Thus, total dry film thickness of all the coats, including primer</p>			

Item No.	Item	Unit	Rate	Remarks
	<p>coat, should not be less than 125 microns. This will include expenses on mobilization and demobilization of equipments.</p> <p>For maintenance painting, the surface preparation shall be done by appropriate hand and power tool cleaning. Prior to hand and power tool cleaning, any heavy layer of rust should be removed by chipping. Visible oil, grease, dirt and other foreign material be cleaned using solvents like clean mineral spirits, xylol or white gasoline. After hand and power tool cleaning, the surface should be cleaned of loose dust and debris and / or blast cleaned as laid down in Para 7.0 of IS code 14177 – 1994. After the surface preparation, the primer and finishing coats shall be carried out as provided above for painting.</p>			
	(i) Up to 1.5 m height	sqm	202.00	
	(ii) Beyond 1.5 m height	sqm	222.00	
	<p>Note: - The rates in item 1857 (i) & (ii) are applicable only for installed machinery etc. For non-installed machinery the rates mentioned in 1857 (i) shall be applicable.</p>			
1858	<p>Painting of unmachined surfaces, as per IS 14177-1994, for which surface preparation by blast cleaning of class 'B', primer coat (one coat) of chlorinated rubber based zinc phosphate primer, to provide a dry film thickness of 50 ± 5 microns and finish coat (three coats) of vinyl resin/ chlorinated rubber, using airless spray, to provide a dry film thickness of 30 ± 5 microns per coat. Thus, total dry film thickness of all coats including primer coat should not be less than 125 microns. This will include expenses on mobilization and demobilization of equipments.</p> <p>For maintenance painting, the surface preparation shall be done by appropriate hand and power tool cleaning. Prior to hand and power tool cleaning, any heavy layer of rust should be removed by chipping. Visible oil, grease, dirt and other foreign material be cleaned using solvents like clean mineral spirits, xylol or white gasoline. After hand and power tool cleaning, the surface should be cleaned of loose dust and debris</p>			

Item No.	Item	Unit	Rate	Remarks
	and / or blast cleaned as laid down in Para 7.0 of IS code 14177 – 1994. After the surface preparation, the primer and finishing coats shall be carried out as provided above for painting.			
	(i) Up to 1.5 m height	sqm	282.00	
	(ii) Beyond 1.5 m height	sqm	293.00	
	Note: - The rates in item 1858 (i) & (ii) are applicable only for installed surfaces. For non-installed surfaces the rates mentioned in 1858 (i) shall be applicable.			

CHAPTER 19 – DISMANTLING

Notes:-

1. The rate includes- (i) Removal of dismantled materials to a distance of 50 m and all lifts.
(ii) Picking, cleaning, sorting out and stacking of serviceable materials and unserviceable materials separately.
2. Measurements- (i) Measurement of all works shall be recorded before dismantling.
(ii) All measurements shall be measured along the existing slopes.
(iii) for dismantling walls with plaster, measurement will be exclusive of plaster thickness.
3. In dismantling, the articles shall be carefully removed and passed by hand, where necessary, lowered to the ground and not thrown. Iron and A.C. sheets, wooden planks etc. shall be removed with proper tools and not torn off by force.
4. All dismantled materials shall from the Government property.
5. During dismantling, every precaution shall be taken to prevent damage to any part of structure and also to any adjoining structure, which are to be left intact.
6. The rates are applicable to all types of structures viz. Roads, Buildings, Bridges and Floors and all heights.
7. An inventory of all possible serviceable materials shall be prepared. This record shall be kept for proper control during execution of work.

Portions required to be retained shall be marked before starting dismantling.

A register shall be kept at the work site in which day to day account of the turn out and the salvaged materials shall be maintained. This register shall also show weather – dismantled material is properly stacked or wasted.

8. All the materials obtained from the removal of the structure shall be the property of Government Serviceable materials shall be stacked neatly in such a manner as to avoid deterioration and a places directed by Engineer-in-Charge with in specified lead. Different categories of materials shall be stacked separately.

Unless otherwise provided, excavated materials shall be used in back filling the excavation made in removing the structure in leveling ground or otherwise disposed off as directed with in specified lead.

Non serviceable materials shall be disposed off without causing any damage or inconvenience.

Item No.	Item	Unit	Rate	Remarks
1901	Dismantling rammed moorum and boulders or rammed moorum and metal in foundations and under floors	cum	105.00	
1902	Dismantling lime concrete or cement concrete in foundations or under floors, haunches or arches or terrace.	cum	158.00	
1903	Dismantling cement concrete in floors and superstructure.	cum	455.00	
1904	Dismantling reinforced cement concrete in roofs, upper floors, slabs, columns, lintels, arches, chajjas, stairs or any other structure, above plinth.	cum	560.00	
1905	Dismantling R.C.C. rafts, columns, beams in foundation and plinth only.	cum	455.00	
1906	Dismantling brick masonry including arches in lime or cement mortar	cum	184.00	
1907	Dismantling stone masonry including arches in lime or cement mortar.	cum	230.00	
1908	Dismantling mud or sun dried brick walls	cum	72.00	
1909	Dismantling stone or brick masonry in clay, dry stone or dry boulder walling, stone pitching or dry paving.	cum	139.00	
1910	Dismantling flag stone flooring, bricks laid flat or on edge, curbs, or aprons etc. (each layer) in lime or cement mortar, bricks or tiles laid on roof in lime or cement mortar, excluding sub-base	sqm	27.00	
1911	Dismantling thatched roof including roof timber.	sqm	18.00	
1912	Dismantling single Allahabad tile, Mangalore or single wheel tile roof including roof timber (excluding trusses).	sqm	37.00	
1913	Removing single wheel tiles or single Allahabad tiles or Mangalore tiles from roofing.	sqm	26.00	
1914	Dismantling double Allahabad tiles, roof, including roof timber (excluding trusses).	sqm	61.00	
1915	Dismantling wooden beams posts scantlings or trusses.	cum	427.00	
1916	Dismantling wooden ballies of any diameter	m	4.00	

Item No.	Item	Unit	Rate	Remarks
1917	Dismantling G.I. sheets or A.C. sheets, (Trafford, corrugated or curved, etc) and wind ties, etc. excluding roof timber.	sqm	11.00	
1918	Dismantling ceiling of textile, Hessian. Cloth, matting of any type (single or double) including wooden frames.	sqm	4.00	
1919	Dismantling or wooden ceiling or flooring or A.C. sheet ceiling or walling or wall and ceiling boards, of any thickness (Fiber insulation with battens etc. excluding timber in ceiling wall or floor).	sqm	8.00	
1920	Dismantling mud plaster	sqm	2.00	
1921	Dismantling limes or cement plaster of any thickness.	sqm	6.00	
1922	Taking out door chowkhats including shutters and including dismantling the necessary masonry.	each	79.00	
1923	Taking out window chowkhats including shutters, including dismantling the necessary masonry.	each	61.00	
1924	Taking out stone lintels of doors and windows from building masonry or stone slabs of culverts.	cum	409.00	
1925	Dismantling structures like rolled steel, joists, 1-section, T-section, Angles, channel sections etc. plates for beams, columns, stanchions, trusses, etc.	kg	5.00	All nuts and bolts should be Opened
1926	Scrapping of old walls, carefully with brushes for making it suitable for distemper or paint by sand papering including washing with water, etc. complete.	sqm	4.00	
1927	Scrapping of ceiling carefully, with brushes, making it suitable for distemper or paint by sand papering including washing with water, etc. complete.	sqm	6.00	
1928	Dismantling terrazzo or mosaaic or glazed vitreous or patent cement or tiled flooring or dados skirting of any thickness without sub base	sqm	26.00	
1929	Ranking out old pointing in lime or cement mortar of any mix (from stone masonry.	sqm	20.00	
1930	Raking out old pointing in lime or cement mortar of any mix from brick masonry.	sqm	28.00	

Item No.	Item	Unit	Rate	Remarks
1931	Dismantling Hume pipe joints.	m	11.00	Circumferential measurement
1932	Dismantling Hume pipes from culverts, syphons, aqueducts, super passages, sluice barriers, etc. including dismantling collar joints, excluding the dismantling of concrete in foundation and around the pipes-			
	(a) Up to 0.30 m dia	m	25.00	
	(b) Above 0.30 m dia to 0.45m dia	m	40.00	
	(c) Above 0.45m and up to 0.60m dia	m	49.00	
	(d) Above 0.60m and up to 0.75 m dia	m	67.00	
	(e) Above 0.70m and up to 1.00m dia	m	87.00	
	(f) Above 1.00 and up to 1.10m dia	m	131.00	
	(g) 1.20 m dia	m	161.00	
1933	Dismantling G.I. pipe line -			
	(a) Up to 50 mm dia	m	1.00	
	(b) Above 50 mm dia	m	2.00	
1934	Dismantling and removal of karri shutters and stacking properly	sqm	131.00	

CHAPTER 20 – ROADWORK

Notes :-

1. Rates do not include cost of collection of boulders, metal, moorum and bitumen unless otherwise specified.
2. Rates however include lead up to 50m and all lifts for all materials unless otherwise specified.
3. Open season means the period between 1st November to 15th June. No payment for lead of water shall be made for consolidation done in wet season, i.e. from 16th June to 31st October.
4. For open season consolidation no lead water is payable up to 100m, for payment beyond 100m lead for water “for departmental works” specific permission of the Chief Engineer/Superintending Engineer is necessary.
5. Oversize metal means of nominal size 60mm to 100mm.
6. The following Indian Road Congress publications may be referred to:-

IRC No.	Title
14-2004	Recommended practice for 2 cm thick bitumen and tar carpets (third revision).
17-1977	Standard specifications and Code of Practice for water bound macadam (second revision).

7. The following Indian Standards may also be referred to

IRC No.	Title
73-1992	Specifications for paving bitumen (Revised) (with amendment No.1) (Reaffirmed 1998)
215-1995	Specifications for Road tar (Revised) (third revision) (Reaffirmed 2000)
217-1988	Specifications for cut back bitumen (Revised) (second revision) (Reaffirmed 1999)
454-1994	Specifications for cut back bitumen-Digbol type (Revised). (Reaffirmed 1999)
3117-2004	Specification for bitumen, emulsion for roads (anionic type).

Item No.	Item	Unit	Rate	Remarks
2001	Labour only for boulder soling hand packed excluding consolidation	cum	97.00	
2002	Moorum or sand spreading including dressing-	cum	30.00	
2003	(a) Consolidation of boulder soling by SRR/DRR including spreading of moorum and lead of water up to 100 m:			
	(i) Including hire and running expenses of roller.	cum	70.00	
	(ii) Excluding hire and running expenses of roller.	cum	52.00	
	(b) Consolidation of oversize metal by SRR/DRR including spreading of moorum and lead of water up to 100m :-			
	(i) Including hire and running expenses of roller.	cum	164.00	
	(ii) Excluding hire and running expenses of roller.	cum	69.00	
	(c) Consolidation of moorum by SRR/DRR including spreading moorum, excluding watering-			
	(i) But including hire and running expenses of roller	cum	42.00	
	(ii) And hire and running expenses of roller.	cum	34.00	
2004	(a) Watering for moorum consolidation with lead of water up to 100m	cum	33.00	
	(b) Labour for watering only in item 2004(a)	cum	7.00	
2005	Picking old surface for consolidation.	sqm	4.00	
2006	Labour only for metal patch repair of WBM surface including picking of old surface.	cum	248.00	
2007	(a) 40 mm size and below metal spreading for consolidation.	cum	46.00	
	(b) Spreading including hand packing and dressing of oversize metal for consolidation.	cum	55.00	
2008	80mm thick water bound macadam coat in wet season by SRR / DRR including spreading of metal and moorum, watering, korebandi (40mm metal)-			

Item No.	Item	Unit	Rate	Remarks
	(a) including hire and running expenses of roller.	cum	272.00	
	(b) excluding hire and running expenses of roller.	cum	163.00	
2009	40 mm thick water bound macadam coat in wet season by SRR / DRR including, picking old surface, spreading of metal and moorum, watering, korebandi (40 mm metal)-			
	(a) Including hire and running expenses of roller.	cum	417.00	
	(b) Excluding hire and running expenses of roller.	cum	277.00	
2010	(a) Deduct from item 2009 for consolidation of metal without picking up old surface -		46.00	
	(b) Labour only for korebandi in item 2008 (size 300mm x 80mm)	cum	11.00	
	(c) Labour only for korebandi in item 2009 (size 300mm x 40mm)	cum	11.00	
2011	Labour only for putting blindage for road topping from road side stacks or mourn or sand	sqm	0.20	
2012	Labour only for cleaning of old surface of water bond macadam for base coat including, removing caked earth and other foreign matter with wire bushes or small picks, sweeping with brooms or soft brushes and finally dusting with sacks or old gunny begs etc.	sqm	2.80	
2013	Labour only for cleaning the old black topped surface for renewal including removing caked earth and other foreign matter with wire brushes or small picks sweeping with brooms or soft brushes and finally dressing with sacks or old gunny bags.	sqm	1.40	
2014	Labour only for cleaning black topped road surface for seal coat laid simultaneously after base coat.	sqm	0.50	
2015	Heating binder up to required temperature including fuel for heating.	tonne	880.00	
2016	Heating binder up to required temperature excluding fuel for heating-	tonne	526.00	

Item No.	Item	Unit	Rate	Remarks
2017	(a) Labour only for applying tack coat on water bound macadam surface.	tonne	1191.00	
	(b) Labour only for applying tack coat on existing black top surface.	tonne	926.00	
2018	Labour only for applying binder for first coat of surface dressing.	tonne	1191.00	
2019	Labour only for applying binder for second coat of surface dressing or seal coat.	tonne	1191.00	
2020	Labour only for spreading metal chips, including screening and dressing.	cum	197.00	
2021	Labour only for mixing and spreading and rolling for premix carped 20mm thick excluding- tack coat and heating of binder-			
	(a) but including hire and running expenses of roller.	sqm	22.00	
	(b) And also hire and running expenses of roller	sqm	12.00	
2022	Rolling for first or second coat or renewal coat of surface dressing-			
	(a) Including hire and running expenses or roller	sqm	7.00	
	(b) Excluding hire and running expenses of roller.	sqm	1.30	
2023	Rolling for seal coat including hire and running expenses or roller.	sqm	5.00	
	(b) Excluding hire and running expenses of roller.	sqm	1.00	
2024	Labour for mixing and spreading and rolling for premix carpet 25mm thick excluding tack coat and heating of binder -			
	(a) but including hire and running expenses or roller.	sqm	28.00	
	(b) And also hire and running expenses of roller.	sqm	14.00	
2025	Add for miscellaneous materials required for cleaning			
	For item 2012	sqm	0.60	
	(b) For item 2013	sqm	0.30	
	(c) For item 2014	sqm	0.15	

CHAPTER 21 – SPECIAL ITEMS OF EARTH/MASONRY DAM AND CANALS

Notes :-

1. Rates include lead up to 100m and all lifts for all materials for all items unless otherwise specified.
2. The item of stripping shall be payable for depths up to 15 cm only if greater depths have to be removed, total depths are to be paid as per rates of general excavation of earthwork.
3. In case of canal embankment the stripping of seat should normally be limited to 8 cms, for canal discharge up to 3 cumecs and embankment height above 1.5m only furrowing and plugging be done for embankments of height less than 1.5 m stripping of seat be done for 15 cms for canal discharge more than 3 cumecs and embankment of height less than 0.6, for such canals.
4. Furrowing and plugging is payable only in the area where benching is not done.
5. Stripping the seat of embankment should not be payable in the area covered by benching the seat of embankment.
6. The rates for excavation of puddle trench includes the cost of cutting and subsequent removal, if ordered, in steps required in deep trenches for the inspecting officers and the working labourers to go down and come up. However it does not include filling up of these steps either by puddle or by earth.
7. The rates for puddle trench excavation, provided in this chapter, are not payable for cut off trench excavation
8. Regarding bailing out water from puddle trench during excavation, note 10 of Chapter 4-“EXCAVATION AND EARTHWORK” is applicable.
9. For items of filter locally available shingle or gravel be use as a first preference. If it is not available locally, metal from excavation of hard moorum with boulder – or rock-cut be used as second alternative , provided it is certified by the Executive Engineer while obtaining sanction to the estimate, that shingle or gravel is not available from nearby nalla or rivers.
10. For use of metal for filter the extra rate for blasting shall not be payable.
11. The items against which multiplying numbers suffixed by “R” have been given in the rates column, the payable rates on NMR shall be arrived at as per note 4 of Chapter2-“Survey and Investigation”.

12. The rates for providing K.M. stones, 0.2K.M stone, chainage-cum-boundary stone of various types include lead up to 10m for all Materials.
13. Chainage-cum-boundary stone as per type design 4 of Water Resources Department are to be provided on irrigation channels and as boundary stones for demarking, boundaries of head works, bund line and quarries etc.
14. On canals the stone (K.M. and 0.2 K.M.) shall be normally fixed with the top of concrete platform at 0.1m above formation level of the canal bank with front edge of the stone at a distance of 1.5m from the outer edge of the bank at top. For this purpose the extra depth of concrete wherever required, over and above the provisions made in completed item, shall be payable as per the rates provided in the relevant chapters.
15. Normally before fixing of the stones (Km, 0.2 Km and bed grade) the chaining of the constructed canal shall be redone.
15. (A) In hand packed stone pitching of 45 cm thick in two layers header stone of size 45x30x30 cm extending through both layers and spaced at about 1.5 m apart shall be used.
16. Measurement- (a) Dimensions shall be measured to nearest 0.01m. The areas shall be worked out to the nearest 0.01 sq.m. The cubical contents shall be worked out to nearest 0.01 cum.
(b) No deduction for voids shall be made from the gross measurements of seepage drain fillings, boulder toe, pitching, filters blanket, etc.
17. The following Indian Standards and I.R.C. Specifications may be referred to:-

I.S. No./IRC No.	Title
I.S. 341-1973	Black Japan, type A, B and C (first revision) (reaffirmed 2002).
I.S. 2933-1975	Enamel, exterior (a) under coating (b) finishing (first revision). (Reaffirmed 2001)
I.S. 3589-2001	Electrically welded steel pipes for water, gas and sewage (200 to 2000mm nominal dia) (with amendment No.1) (Reaffirmed 2006)
I.S. 7319-1974	Perforated concrete pipes. (Reaffirmed 2005)
I.S. 8237-1985	Code of practice for protection of slope of reservoir embankments. (Reaffirmed 2002)
I.S.9556-1980	Code of practice for design and construction of diaphragm walls. (Reaffirmed 2003)
I.S. 9759-1981	Guide lines for dewatering during construction. (Reaffirmed 2003)
I.R. C: 5-2000	Standard specifications and code of practice for road, gridges, section I General features of design (seventh revision).

Item No.	Item	Unit	Rate	Remarks
2101	Stripping the seat of embankment of all foreign materials, vegetation and other growth like grass roots etc., and removing the rubbish up to a distance of 50m including dressing but excluding jungle clearance.	cum	10% over rates for earth work excavation	
2102	Benching the seat of embankment to an average depth of 15cm and cross slope of 1 in 12 including removing the rubbish up to a distance of 50m including dressing.	cum	20% over rates for earth work excavation	
2103	Furrowing and plugging the seat of embankment.	sqm	1.00	
2104	Construction of seepage drains 60 cm x 60 cm under the bund, (excluding excavation of trenches) filling the drains with graded materials such as boulder, shingle and sand in layers, etc., as per Specifications			
	(a) Drains filled with graded boulders.	m	85.00	
	(b) Drains filled with graded quarried stones or rubble.	m	148.00	
	(c) Drains filled, in layers with boulders, shingle and sand.	m	68.00	
	(d) Drains filled in layers with stones, shingle and sand.	m	140.00	
2105	Labour only for -			
	(i) 2104 (a) and (b)	m	51.00	
	(ii) 2104 (c) and (d)	m	23.00	
2106	Construction of seepage drains 75x75cm under the bund excluding excavation of trench) filling the drains with graded materials such as boulders, shingle and sand in layers etc. as per specification.			
	(a) Drains filled with graded boulders.	m	132.00	
	(b) Drains filled with graded quarried stone or rubble.	m	231.00	
	(c) Drains filled in layers, with boulders, shingle and sand.	m	95.00	
	(d) Drains filled in layers, with quarried stones, shingle and sand.	m	277.00	

Item No.	Item	Unit	Rate	Remarks
2107	Labour only for -			
	(i) Item 2106 (a) and (b)	m	80.00	
	(ii) Item 2106 (c) and (d).	m	36.00	
2108	Construction of seepage drains 90cm x 90 cm under the bund (Excluding excavation of trench) filling In drains with graded materials, such as boulders, shingle and sand in layers etc. as per specification -			
	(a) Drains filled with graded boulders.	m	191.00	
	(b) Drains filled with graded quarried stones or rubble.	m	333.00	
	(c) Drains filled, in layers with boulders, shingle and sand.	m	154.00	
	(d) Drains filled in layers with quarried stones, shingle and sand.	m	326.00	
2109	Labour only for-			
	(i) Item 2108 (a) and (b)	m	115.00	
	(ii) Item 2108 (c) and (d)	m	51.00	
2110	Providing filter blanket, horizontally, Including laying, spreading, packing etc., in layers of required thickness but excluding excavation of foundation-			
	(i) Metal 80mm nominal size.	cum	326.00	
	(ii) Metal 60mm nominal size.	cum	372.00	
	(iii) Metal 40 mm nominal size.	cum	531.00	
	(iv) Metal 20 mm nominal size.	cum	676.00	
	(v) Metal 10mm nominal size.	cum	654.00	
	(vi) Shingle 80mm or 60mm nominal size.	cum	235.00	
	(vii) Shingle 40mm nominal size.	cum	279.00	
	(viii) Shingle 20mm nominal size.	cum	337.00	
	(ix) Shingle 10mm nominal size.	cum	328.00	
	(x) Sand passing through 4.75 mm screen.	cum	94.00	
2111	Labour only for -			
	(i) Item 2110 (i) to (ix)	cum	72.00	
	(ii) Item 2110 (x)	cum	59.00	

Item No.	Item	Unit	Rate	Remarks
2112	Add extra over item 2110 and 2111 for laying specified filter layers-			
	(a) on inclined surfaces steeper than, 1 in 5	cum	53.00	
	(b) for chimney filter	cum	92.00	
2113	Construction of rock toe in earthen embankments Including laying and hand packing, dressing, wedging and finishing. over surface with-			Rock fragment of size from 75mm to 250 mm.
	(a) Boulders	cum	290.00	
	(b) Quarried stone -	cum	466.00	
2114	Labour only for Item 2113.	cum	152.00	
2115	Cutting up stream / downstream slopes of embankment to proper slope including dressing, laying and the excavated earth on top of embankment.	cum	same as earth work rate	
2116	Excavation of puddle trench for earthen embankment to proper side slopes and bed grade including shoring, wherever necessary dressing, 50m lead and 1.5m lift-			
	(a) up to 3 m depth	cum	same as earth work rate	
	(b) over 3m up to 6 m depth	cum	20% extra over earth work rate	
	(c) over 6m up to 9m depth	cum	30% extra over earth work rate	
	(d) over 9m up to 12 depth	cum	50% extra over earth work rate	
2117	Puddle filling of good clay including lead up to 50m including mixing, watering and kneading by tamping, ramming and laying etc.	cum	219.00	

Item No.	Item	Unit	Rate	Remarks
2118	Puddle filling of good clay (excluding cost of puddle earth and water including mixing, kneading by tamping, ramming, and laying etc.)	cum	102.00	
2119	Deduct from item 2117 above in case water supplied departmentally.	cum	29.00	
2120	Dry rubble wall (toe wall) with stone of minimum size 0.021 cum at the base of stone pitching or rip-rap excluding excavation.	cum	923.00	
2121	Labour only for item 2120 above	cum	191.00	
2122	(a) Providing 45cm thick hand packed stone pitching with 50% of the individual stones of 45cm depth including laying, finishing etc., but excluding slope cutting of embankment-	sqm	402.00	
	(b) Providing 30cm thick hand packed stone pitching with 50% of the individual stones of 30cm depth including laying, finishing etc., but excluding slope cutting of embankment-	sqm	272.00	
2123	Labour only-			
	(a) For item 2122 (a)	sqm	94.00	
	(b) For item 2122 (b)	sqm	67.00	
2124	Preparing the surface for turfing including laying 15cm of good soil on top in 7.5 cm layers, surface watering and light ramming etc., complete with 50m, lead and all lift.	sqm	20.00	
2125	Turfing on prepared surface, including seed or sods.	sqm	8.00	
2126	Trufing on prepared surface with sods supplied at site of work.	sqm	5.00	
2127	Construction of dowels, 30cm wide on top and 30cm high (2:1 side slopes) on the canal banks, including excavation, with 50m lead, all lift and dressing.	m	26.00	
2128	(a) Construction of dowels, 30cm wide on top and 30cm in height (1:5:1 side slopes) on the canal banks including excavation with 50m lead, all lift and dressing.	m	20.00	
	(b) Construction of dowels, 20cm wide and 20cm in height (1.5:1 side slope) on the canal banks including excavating with 50m lead all lift and dressing.	m	11.00	For inspection banks including paths on the canal

Item No.	Item	Unit	Rate	Remarks
	(c) Construction of longitudinal and transverse bunds (temporary) 15 cm wide and 15cm in height (1:1 side slopes) an uncompacted embankment of new canals including excavating with 50m lead all lifts and dressing.	m	0.05R	To be executed before onset of monsoon after completion of canal earth work.
	(d) Levelling of top surface of banks of new canals to the required longitudinal grade and cross slope, including filling of rain cuts and removal of temporary bunds with all lead and lift.	sqm	0.04R	To be executed after settlement of banks.
2129	Labour only for laying G.I. pipe line (for water supply) on ground including, fitting fixing and threading wherever necessary, including carrying of pipes within 100m lead-			
	(a) Up to 5 cm dia	m	8.00	
	(b) Above 5 cm dia	m	14.00	
2130	(a) Providing K.M. Stone as per type design 1 of Water Resources Department.			Drawing enclosed vide Appendix VII
	(i) Precast in 1:2:4 RCC with 20mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete.	each	804.00	
	(b) Fixing KM stone (type design 2) in 1:3:6 cement concrete with 40mm graded metal including excavation (any strata), handling and fixing of stone, curing etc. complete.	each	646.00	
	(c) Labour only for item 2130 (b) (Type design 3)	each	2.00R	
2131	(a) Providing KM stone as per type design 2 of Water Resources Department.			Drawing enclosed vide Appendix VIII.
	(i) Precast in 1:2:4 RCC with 20mm graded metal including formwork, cost of reinforcement, finishing, curing etc. complete.	each	676.00	
	(b) Fixing KM stone (type design 2) In 1:3:6 cement concrete with 40mm graded metal including excavation (any strata) handling and- fixing of stone, curing etc. complete.	each	642.00	
	(c) Labour only for Item 2131 (b)	each	2.00R	

Item No.	Item	Unit	Rate	Remarks
2132	Painting KM stone (type design 1 or 2) with canary yellow background of enamel paint and figuring and lettering with black paint including cost of paint, brushes etc. complete.	each	140.00	
2133	Labour only for Item 2132	each	70.00	
2134	(a) Providing 0.2 KM stone made of precast 1:2;4 RCC 20 mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete, as per type design 3 of Water Resources Department.	each	150.00	Drawing enclosed vide Appendix IX
	(b) Fixing 0.2 KM stone (type design3) in 1:3:6 cement concrete with 40mm graded metal including excavation (any strata) handling and fixing of stone, curing etc. complete.	each	394.00	
	(c) Labour only for item 2134(b)	each	1.00R	
2135	Painting 0.2 KM stone (type design 3) with canary yellow back ground of enamel paint and figuring and lettering with black paint including cost of paint brushes etc. completed.	each	70.00	
2136	Labour only for item 2135	each	35.00	
2137	(a) Providing chainage-cum-boundary stone made of precast 1:2;4 RCC 20 mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete, as per type design 4 of Water Resources Department.	each	150.00	Drawing enclosed vide Appendix X
	(b) Fixing chainage-cum-boundary stone (type design 4) in 1:3:6 cement concrete with 40mm graded metal including excavation (any strata) handling and fixing of stone, curing etc. complete.	each	394.00	
	(c) Labour only for item 2137 (b)	each	1.00R	
2138	Painting chainage-cum-boundary stone (type design 4) with white back ground of enamel paint and figuring and lettering with black paint, including cost of paint brushes etc. complete.	each	47.00	
2139	Labour only for Item 2138	each	24.00	

Item No.	Item	Unit	Rate	Remarks
2140	(a) Providing 5 th KM stone as per IRC type design (5-1970) on NS,SH or MDR			
	Precast in 1:2:4 RCC with 20mm graded metal including formwork, cost of reinforcement, finishing and curing etc. complete.	each	1163.00	
	(b) Fixing 5 th KM stone (IRC:5-1970) in 1:3:6 C.C. with 40mm graded metal including excavation (any strata), handling and fixing of stone, curing etc. complete (on NH,SH or MDR).	each	859.00	
	(c) Labour only for item 2140 (b)	each	3.00R	
2141	(a) Providing ordinary KM stone as per IRC of type design (5-1970) on NH,SH or MDR-			
	1:2:4 RCC with 20 mm graded including form work cost of reinforcement and curing finishing etc. complete.	each	635.00	
	(b) Fixing ordinary KM stone (IRC:5-1970) in 1:3:6 C.C. with 40mm graded metal including excavation (any strata), handling and fixing of stone, curing etc. complete. (on NH,SH or MDR).	each	704.00	
	(c) Labour only for Item 2141 (b)	each	2.50R	
2142	(a) Providing KM stone as per IRC type design (5-1970) on C.D. or village roads			
	Precast in 1:2:4 RCC with 20mm graded metal including formwork, cost of reinforcement, finishing and curing etc. complete .	each	464.00	
	(b) Fixing KM stone (IRC:5-1970) in 1:3:6 C.C. with 40mm graded metal including excavation (any strata), handling and fixing of stone, curing etc. complete. (on C.D. or village roads).	each	658.00	
2143	(a) Providing 0.2 KM stone made of precast 1:2;4 RCC 20 mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete, of size 20x15x15 cm (IRC:25-1967)	each	84.00	
	(b) Fixing 0.2 KM stone (IRC:26-1967) in 1:3:6 cement concrete with 40mm graded metal including excavation (any strata), handling and fixing of stone, curing etc. complete.	each	138.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Labour only for item 2143 (b)	each	0.50 R	
2144	(a) Providing boundary stone made of precast 1:2;4 RCC 20 mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete, of size 20x15x15 cm (IRC:25-1967)	each	120.00	
	(b) Fixing boundary stone (IRC:25-1967) in 1:3:6 C.C. with 40mm graded metal including excavation (any strata), handling and fixing of stone, curing etc. complete.	each	446.00	
	(c) Labour only for item 2144(b)	each	1.10 R	
2145	(a) Painting of K M stone/0.2 KM stone with white back ground of enamel paint and figuring and lettering with black paint including cost of paint, brushes etc. complete-			
	(i) 5th KM stone on NH, SH or MDR	each	140.00	
	(ii) Ordinary KM stone on NH, SH or MDR	each	70.00	
	(iii) KM stone on C.D. or village road	each	70.00	
	(iv) 0.2 KM stone or boundary stone	each	47.00	
	(b) Labour only for			
	(i) Item 2145 (a)(i)	each	79.00	
	(ii) Item 2145 (a) (ii)	each	39.00	
	(iii) Item 2145 (a) (iii)	each	39.00	
	(iv) Item 2145 (a) (iv)	each	22.00	
2146	Providing bed grade stones made of precast 1:2;4 RCC 20 mm graded metal including formwork, cost of reinforcement, finishing, curing, etc. complete, as per type design 5 of Water Resources Department.			Drawing enclosed vide Appendix XI
	(a) size 60x15x15 cm	each	77.00	
	(b) size 55x15x15 cm	each	67.00	
	(c) size 50x15x15 cm	each	62.00	
2147	Fixing bed grade stones (type design 5) in 1:3:6 cement concrete with 40mm graded metal including excavation (all types of soil), orientation of stone along centre line and top of concrete in flush with designed bed level, curing etc. complete.	each	526.00	
2148	Labour only for item 2147	each	2.00 R	

Item No.	Item	Unit	Rate	Remarks
2149	Providing 90cm thick hand packed pitching with 50% of the individual stones of 45cm depth including laying finishing etc. but excluding slope cutting of embankment-	sqm	773.00	
2150	Labour only for item 2149 (a) & (b)	sqm	188.00	
2151	Providing and placing in position porous concrete (1 cement : 4 metal of maximum size 40mm) drains, including all lifts, shuttering, curing, cleaning during construction, etc. complete in all respect.	cum	2529.00	
2152	(a) Providing and fixing in position 1mm thick and 355mm wide annealed copper sealing strips in construction joints, including bending to specified shape and providing butt joints- with overlap of 50mm and 10mm dia M.S. anchor rods of 600mm length at 900mm centre to centre alternately on both sides, Including welding and brazing of anchor bars and joints, etc., complete in all respect.	m	2476.00	
	(b) Providing and fixing in position PVC water joints 225 mm wide (type 104) embedded in RCC works in expansion joints with heat sealed joints etc. complete in all respect.	m	1973.00	
2153	Dewatering and pumping of the working area including all connected operations of laying of pipe line, removal of all seepage and other operations required for maintaining cleanliness for construction work-			
	(a) Measured in terms of electric energy consumed.	KWH	26.00	
	(b) By diesel pumps-			
	(i) Up to 5 HP	hour	106.00	
	(ii) More than 5HP to 10HP	hour	168.00	
	(iii) More than 10HP to 20HP	hour	292.00	
	(iv) More than 20HP to 30HP	hour	417.00	
	(v) More than 30 HP to 40 HP	hour	479.00	
2154	Preparation of old surface of concrete after a lapse of 3 months or more for laying fresh concrete by chiseling, sand blasting, etc. complete (compressed air and water under pressure to be provided by the department).	sqm	79.00	

Item No.	Item	Unit	Rate	Remarks
2155	Preparation of old surface of masonry mortar joints after a lapse of 3 months or more for laying fresh masonry by chiseling, sand blasting etc. complete (compressed air and water under pressure to be provided by the department.	sqm	36.00	
2156	Providing and application of cement sand slurry 1:2 on old concrete surface, average thickness 12.5mm (10kg cement).	sqm	98.00	
2157	Providing and application of neat cement slurry on foundation of old masonry, average thickness 6 mm (6.5 kg cement).	sqm	67.00	
2158	Labour only for laying 25cm dia perforated cement concrete pipes in position, including lowering into trenches and packing joints with gravel so as to keep the gap constant around pipes.	m	67.00	
2159	(a) Earthwork or bunds in hearting or casing with approved soil by means of heavy earth moving machinery including 0.5km lead and all lifts.	cum	190.00	Only for comparison of cost of work done by E&M Organisation
	(b) Add for lead charges beyond 0.5Km	cum	As per item 2902	
2160	M25 RCC diaphragm wall with graded aggregate of maximum size 20mm excavating trench, reinforcement, grouting of joints, performance of all test and trimming top 0.50m including cost of all operations with all lead and lift, etc. complete in all respect (40kg steel).			As per rate analysis
	(a) up to 6.00m depth	cum	14964.00	
	(b) above 6.00m depth	cum	19019.00	
2161	Compaction of sand filter -			
	(a) By vibrator rammers	cum	11.00	
	(b) By vibratory plate compactors	cum	8.00	
2162	Labour only for weaving G.I. Wire Crates (double knots) (for pitching)-			
	(a) 100mm mesh	sqm	14.00	
	(b) 150 mm mesh	sqm	9.00	

Item No.	Item	Unit	Rate	Remarks
2163	Placing woven G.I. wire crates and packing pitching stones in them	sqm	77.00	
2164	Providing 40mm thick plaster for contraction joints with cement, mortar of strength 0.5 N/Sq. mm including all lifts, scaffolding, curing and cleaning etc. complete.	sqm	259.00	Approx. mix 1:4
2165	Providing and fixing in position ERW M.S. pipes of 30cm internal dia and 5 mm thickness (IS 3589-1966) for air vent in masonry dam including all lead and lift fitting complete.	m	3064.00	
2166	Providing and placing dumped rip-rap with 50% individual stones of 0.05 cum (130kg) including laying finishing etc. but excluding cutting of embankment.	cum	608.00	Thickness to be fixed as per design.
2167	Providing 45 cm thick hand-packed stone pitching in two layers with 50% of the individual stones of 22.5 cm depth including laying finishing etc. but excluding slope cutting of embankment.	sqm	384.00	
2168	Providing and fixing 25 mm diameter steel high yield strength deformed anchor bars in minimum 40 mm dia. holes in all formations of rock/ concrete including necessary anchoring arrangements, Grouting with cement grout complete as per specification.	RM	622.00	
2169	(a) Reaming of existing 200mm dia. Porous concrete holes in the galleys of dam with under ground core drilling machine (air motor operated) with T.C. bit including cost and conveyance of all materials, labour charges, mobilization of required machinery, shifting and erection of machines from one hole to another complete.	RM	1728.00	As per rate analysis.
	(b)Washing of porous concrete holes of any size in galleries of dam with under ground without reaming including cost and conveyance of all materials, labour charges, mobilization of required machinery, shifting and erection of machines from one hole to another complete.	RM	675.00	

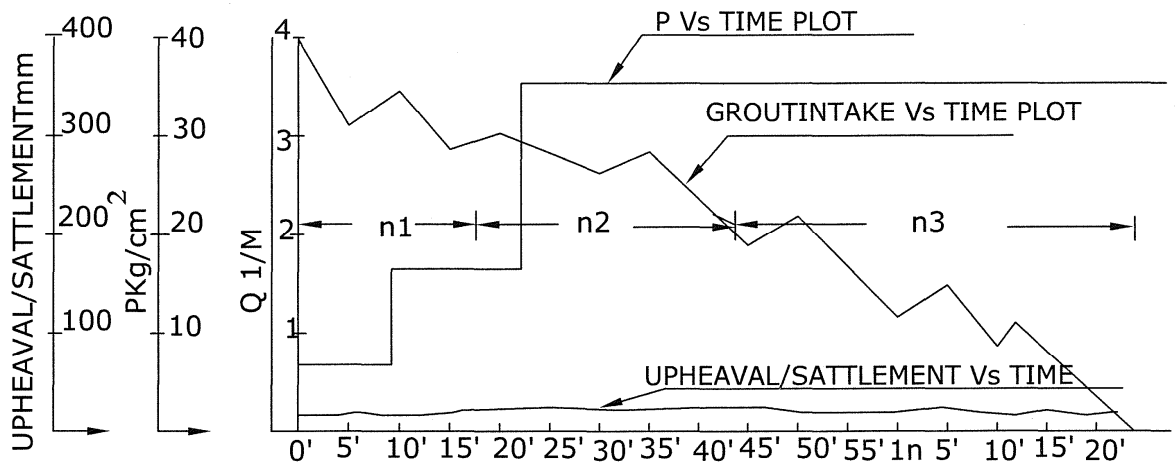
CHAPTER 22 – DRILLING AND GROUTING

Notes:-

1. Rates include all lead and lift for all materials.
2. The rates for drilling are inclusive of cost of taking out cores, logging, labelling and preservation of cores, maintained in serial order and painting depths on cores and on the core box, and protection of drill holes till final measurements.
3. All items where use of water is required are inclusive of water charges and Air charges and no separate payment is to be made for.
4. Rates for drilling are inclusive of taking out relatively undisturbed sample (penetration samples) in soil.
5. Rates for drilling are exclusive of the cost of special washing and conducting percolation tests.
6. When casing pipes are to be left permanently in the holes, rate for drilling shall be inclusive of labour for fixing casing pipes, but exclusive of the cost of casing pipes.
7. The rates for drilling are inclusive of all charges for fixing casing pipes, to the extent necessary and taking out the same after final measurement.
8. Measurements- (a) The linear dimensions shall be measured correct to the nearest 0.01 m. The area shall be worked out in sqm correct to two places of decimal and cubical contents in cum correct to two places of decimal.
 - (b) The measurement for all types of grouting shall be made on the basis of cement in the grout actually forced into the holes.
 - (c) The method of recording, the details of grouting operation and determining the quantity of grout consumed may be adopted as under
 - (i) For measurement of the quantity of grout injected in each hole, a grout history sheet on proforma given below shall be recorded giving grout intake per minute, viscosity of grout mix in form of solids and water ratio, pressure of injection, time of pumping in water for lubrication, event of blowing of grout, to keep the grouting system alive. In addition, various other points of importance observed during the operation of grouting are recorded for every 5-10 minutes intervals and thus the grout history sheet when plotted as shown in Fig.1 shall depict the exact amount of grout injected.

Actually this graph from the grout history sheet should be plotted and form the basis of measurement and payment on actual basis and to depict the factual amount of grout injected. The area under the curve shall represent the quantity of grout actually injected. A register shall be maintained of 100 such sheets. Each sheet shall be machine numbered on both sides.
 - (ii) Recording of the surface leakage, if any, shall be made in the remark column of the grout history sheet showing the location. The leakage should be immediately stopped by reducing the pressure and caulking suitably. The grout should not be allowed to leak more than 5 percent by visual judgement.

- (iii) Measurement of cement, blown off and circulated in the grout lines, shall be separately recorded in mass of cement actually used for purposes of accounting the cement actually used for the enabling works.
- (iv) In case of stage grouting of the hole, cement grouted in each stage shall be summed up.



TIME IN MINUTES/HOURS

Note: Area under curve "Grout intake (Liters/Minute)Vs time" also include the amount of grout blown off in case grout intake (Liter/Minute)Vs time plot accounts for blowing off.

n1 n2 n3 = Water: Solid ratio

FIGURE – 1 GRAPH FROM GROUT HISTROY SHEET

Typical Proforma for Grout History Sheet

Date : 16-12-1989

Sl. No.	Feature and RD. of hold	Hole No.	Depth Drilled	Method	Pressures		Grout Consistency	Time	Rate of consumption	Remarks about The type of Leakage
					Specified	Use				
1	2	3	4	5	6	7	8	9	10	11
	Consolidation Grouting of Concrete Dam.						(Water cement ration by Vol.)			
1	100.00m	Fg-	3.0m	Descending Stage (Packer)	1.5 kg/cm ²	3/4 kg/cm ²	10:1	8.00AM	50L/min	No Leakage
						1 kg/cm ²		8.02AM	50L/min	
						1 kg/cm ²		8.05AM	40L/min	
						1 kg/cm ²		8.10AM	42L/min	
						1 kg/cm ²		8.20AM	30L/min	
						1 kg/cm ²		8.40AM	20L/min	
						1.5 kg/cm ²		8.45AM	20L/min	
						1.5 kg/cm ²		8.50AM	10L/min	
						1.5 kg/cm ²		9.00AM	5L/min	
						1.5 kg/cm ²		9.30AM	Nil.	
						1.5 kg/cm ²		9.40AM	Nil.	

9. The following Indian Standards may also be referred to

I.S.No.	Title
4078-1980	Code of practice for indexing and storage drill cores (first revision). (Re 2000)
4464-1985	Code of practice for Presentation of drilling information and core description in foundation investigation. Re 2000
4999-1991	Recommendations for grouting of previous soils. Re 1999
5541-1970	Pneumatic portable drilling machine (with amendment No.1) Re 1998
6066-1994	Recommendations for pressure grouting of rock foundations in river valley projects. Re 2004
6926-1996	Code of practice for diamond drilling for site investigation for river valley projects. Re 2006

Item No.	Item	Unit	Rate	Remarks
2201	(a) Transportation of drilling equipment from place of location to work site and from work site to place of location.	job	26705.00	
	(b) Departmental shifting of drilling equipment from workshop to worksite and worksite to workshop-			Item 2201(b) is for departmental execution
	(i) Loading into truck	job	2102.00	
	(ii) Unloading from truck	job	2102.00	
	(iii) Truck charges (distance counted from workshop to worksite).	km	Fixed by S.E. E/M	As per chapter no. 29
2202	Shifting drilling equipment from one drill hole to another	job	2102.00	Payable for exploratory drilling work only
2203	Drilling approximately 75mm dia. vertical holes by calyx or any other rotary process (except diamond drilling) complete.			
	(a) In all strata other than rock	m	1581.00	
	(b) In all strata like masonry, concrete, rock or similar formation of very hard conglomerate.	m	2371.00	
2204	Drilling by diamond drilling, holes of minimum 75mm dia. vertical or at specified inclination with double tube core barrel in masonry, concrete or rock-			

Item No.	Item	Unit	Rate	Remarks
	(a) 0° to 10° vertically downwards	m	7113.00	
	(b) Exceeding 10° but not exceeding 45° vertically downwards.	m	7824.00	
	(c) 0° to 45° vertically upwards	m	9958.00	
	(d) Up to but not including 45° to the horizontal.	m	8535.00	
2205	Drilling by diamond drilling, holes of less than 75mm dia. vertical or at specified inclination with double tube core barrel in masonry, concrete or rock-			
	(a) 0° to 10° vertically downwards	m	6401.00	
	(b) Exceeding 10° but not exceeding 45° vertically downwards	m	7042.00	
	(c) 0° to 45° vertically upwards	m	7298.00	
	(d) Up to but not including 45° to the horizontal.	m	7682.00	
2206	Drilling 35mm dia holes in rock by jack hammer up to 6m.	m	359.00	
2207	Drilling 50 mm dia holes in rock or depth exceeding 6m by wagon drill.	m	813.00	
2208	Wet percussion drilling 35 to 75mm dia. holes in open space for grouting or anchor etc., vertical or at specified inclination, in masonry, concrete or rock including flushing and routine washing of Holes up to 30 minutes -			
	(a) 0° to 10° vertically downwards	m	1755.00	
	(b) Exceeding 10° but not exceeding 45° vertically downwards.	m	1931.00	
	(c) 0° to 45° vertically upwards	m	2457.00	
	(d) Up to but not including 45° to the horizontal	m	2106.00	
2209	Wet percussion drilling 35 to 75mm dia holes in drainage gallery, for grouting or anchor etc., vertical or at specified inclination, in masonry concrete or rock including flushing and routine washing of holes up to 30 minutes.	m	2340.00	
	(a) Exceeding 10° but not exceeding 45° vertically downwards.	m	2516.00	
	(b) 0° to 45° vertically upwards	m	3218.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Up to but not including 45° to the horizontal.	m	2750.00	
2210	Conducting percolation test in the drill holes at the desired pressure, Including water supply arrangements and necessary accessories etc. complete -			
	(a) Up to 10m depth	each	497.00	
	(b) Beyond 10m depth for every addition at 10m depth or part thereof.	each	99.00	Add in item no.2210(a)
2211	Conducting standard penetration test in the bore holes at every 1.5m interval from the desired elevation including cost of all accessories and arranging of cores from depths as obtained			
	(a) Up to 10m depth	each	597.00	
	(b) Beyond 10m depth for every addition at 10m depth or part thereof.	each	119.00	Add in item 2211(a)
2212	Redrilling (wet percussion) set or partially set grout holes for items no. 2208 and 2209	m	439.00	
2213	Special washing of holes, including cleaning, flushing and all related incidental works, etc., complete.	per hour	488.00	
2214	Grouting of 35 to 50mm dia. holes with cement grout mix, at required pressure, including cost of cement and maintenance of all technical records, incidental works, materials complete.	per tonne of cement	14859.00	
2215	Providing and fixing black steel casing pipe including cutting, threading, etc., complete-			
	(a) 50 mm dia	m	497.00	
	(b) 64 mm dia	m	597.00	
	(c) 80mm dia	m	796.00	
	(d) 100 mm dia	m	1193.00	
2216	Providing and installing metal tubing, brass, steel, cast Iron fittings and valves	kg	269.00	
2217	Supplying and installation of foundation displacement indicator complete.	each	9945.00	
2218	Extra rate for providing wooden core boxes of suitable size for preserving m length of core.	each	1492.00	Payable for exploratory drilling work only

CHAPTER 23 – TUNNELS

Notes:-

1. Rates are inclusive of all underground lead and lift and inclusive of ground lead up to 100m only and all lifts for all materials for complete items unless otherwise specified.
2. Excavation- (a) All the open cut excavation shall be measured and paid as per Chapter 4 – “Excavation and Earthwork”.
 - (b) Sectional measurement shall normally be taken. Only in exceptional cases, where sectional measurements are not possible, the payment for rock excavation may be done by stack measurements in which case 40% deduction shall be made from the gross quantities to make allowance for voids.
 - (c) The rates include dressing to the extent necessary for a particular item of work.
 - (d) The payment for excavation shall be done as per pay line indicated in the drawing.
 - (e) The payment for over break beyond pay line if beyond human control shall be-
 - (i) 50% for excavation items; and
 - (ii) 80% for concrete items.
3. Iron work- The rates include all labour and material that go into finished product such as-
 - (a) Drilling, punching, fitting, cutting, bending, forging etc.,
 - (b) All bolts, nuts, washer, plate, screws, rivets, cleats, wedges etc.
 - (c) Fabrication, erection, finishing and fixing in position.
4. The rates given under this chapter are for work inside the tunnel, shaft and adit.
5. Measurements- (a) Linear dimensions shall be measured to the nearest 0.01m, the area shall be worked out to the nearest 0.01 sqm and cubical contents to the nearest 0.01cum.
 - (b) The measurement of permanent supports shall be done by weight, in kg which shall include the total weight of steel sections including the logging, if any butt plates, feather plates, bolts and nuts and tie rods.
 - (c) No deduction shall be made for the volume of the reinforcement, but the volume of permanent steel supports where provided shall be deducted from the total volume of concrete lining.
6. The following Indian Standards may be referred to:-

I.S.No.	Title
4756-1978	Safety Code for tunneling work (first revision) (Re 2007)
4880	Code of practice for design of tunnels conveying water-
4880(Pt I)-1987	General design (Re 1999)
4880 (Pt II)-1976	Geometric design (first revision) (Re 2000)
4880 (Pt III)- 1976	Hydraulic design (first revision) (Re 2000)
4880 (Pt IV)-1971	Structural design of concrete lining in rock (Re 2000)
4880 (Pt V)- 1972	Structural design of concrete lining in soft strata and soils.

4880 (Pt VI)-1971	Tunnel supports (Re 2000)
4880 (Pt VII)-1975	Structural design of steel lining (Re 2000)
5878	Code of practice for construction of tunnels-
5878(Pt 1)-1971	Precision survey and setting out (Re 2000)
5878 (Pt II/Sec 1)- 1970	Underground excavation in rock, section 1-Drilling and blasting. (Re 2000)
5878 (Pt II/Sec 2)- 1971	Underground excavation in rock, section 2-Ventilation, lighting mucking and dewatering. (Re 2000)
5878 (Pt II/Sec 3)- 1971	Underground excavation in rock section 3 – Tunneling method for steeply inclined tunnels, shafts and underground power houses. (Re 2000)
5878 (Pt III)-1972	Underground excavation in soft strata (Re 2000)
5878 (Pt IV)- 1971	Tunnel supports (Re 2000)
5878 (Pt V)-1976	Concrete lining (first revision) (Re 2000)
5878 (Pt VI)- 1975	Steel lining (Re 2000)
5878 (Pt VII)- 1972	Grouting (Re 2000)
6433-1972	Guniting equipment (Re 2005)

Item No.	Item	Unit	Rate	Remarks
2301	(a) Driving tunnel and shafts in all types of rock not requiring permanent supports, including, drilling blasting, mucking the excavated stuff, including ventilation and lighting arrangements, disposing off the same as directed including all underground leads and 100m ground lead with all lifts-			
	(i) For tunnel and shaft up to pay line	cum	1474.00	
	(ii) For authorised tunnel enlargement and recess in tunnel.	cum	1770.00	
	(b) Driving tunnel and shafts in all types of soil and rock requiring permanent supports, including drilling, blasting, mucking the excavated stuff including ventilation and lighting arrangements, disposing off the same as directed including all underground leads and 100m ground lead with all lifts-			
	(i) For tunnel and shaft up to play line	cum	2350.00	
	(ii) For authrised tunnel enlargements and recess in tunnel.	cum	2836.00	

Item No.	Item	Unit	Rate	Remarks
2302	Providing and fixing permanent steel supports for tunnel and shafts in position including hoisting fabrication, packing supporting, bolting and all leads and lifts etc., complete.	tonne	72466.00	
2303	Guniting the rock surface with 25mm thick layer of 1:3 cement sand mixture including wastage, dressing, finishing, preparation of surface etc., complete.	sqm	364.00	
2304	Drilling 35mm to 40mm holes in rock and providing and fixing steel rock bolts 25mm dia., with necessary threading, splitting nuts, washers and bearing plates of 20cm x 20cm x 10mm etc. complete as per specifications.	m	944.00	
2305	Drilling 35mm to 40mm holes in rock for perfo bolts and providing and fixing perfo tubes and filling, grout/motar including providing and driving steel bolts 20 to 25mm dia etc., complete.	sqm	1040.00	
2306	Drilling 35mm to 75mm dia holes inside the tunnel/adit/shaft by percussion method with integral drill steel up to 4m depth for consolidation grouting and deep anchors etc. vertical or inclined in masonry, concrete or rock including labour, maintenance of records, flushing and routine washing of holes up to 30 minutes including- electric charges, haulage, ventilation, lifting, carriage charges etc., complete.	m	2066.00	
2307	Drilling drainage and core test holes inside the tunne /adit /shaft by diamond drilling of 75 mm dia vertical or specified inclination with double tube core barrel including logging, labelling and boxing etc., of cores up to 10m depth complete.	m	4458.00	
2308	Providing and fixing black grout pipes 50mm dia cutting, fabrication and material etc., complete.	m	476.00	
2309	(a) Grouting of 35mm to 40mm holes with cement grout mix at required pressure including cost of cement and maintaining of all technical records, incidental work and material complete as per specifications.	per bag of 50kg cement	1214.00	

Item No.	Item	Unit	Rate	Remarks
	(b) Extra for providing and placing sand or stone dust during grouting complete as per specifications.	per cum of sand of stone dust	9980.00	
2310	Providing and placing in position RCC sleepers, slips between flanges of steel ribs as forms for initial lining, precast in M15 concrete with graded metal of maximum size 12.5mm and slump 50mm to 75mm excluding cost of reinforcement but including cost of formwork, vibration, finishing and curing etc., inclusive of all operations connected with the work complete.	cum	7222.00	
2311	Providing and placing in position M 10 cement concrete with graded metal of maximum size 40mm and slump 50 to 100 mm complete-			
	(a) For initial lining of tunnel behind sleepers	cum	5794.00	
	(b) For lining of shaft including shuttering	cum	6182.00	
2312	Providing and placing in position M 15 cement concrete for final lining of tunnel with graded metal of maximum size 40mm and slump 50mm to 100mm including centering, shuttering vibration, finishing, curing, cleaning complete.	cum	7492.00	
2313	Providing and fixing temporary supports, of more than 75mm dia teak wood ballies, inside tunnel including blocking etc., complete.	m	44.00	
2314	Dewatering and pumping of the working area in the tunnel including all connected operations of laying of pipeline, removal of all seepage and other operations required for maintaining cleanliness for construction work.	Kwh	26.00	

CHAPTER 24 – SPECIAL ITEMS OF CANAL STRUCTURES AND BRIDGES

Notes :-

1. Rates include 100-m lead and all lifts for all materials for all items unless otherwise specified.
2. The rates include, unless otherwise stated, where necessary, conveyance and delivery, handling, unloading, storing, fabrication, hoisting, all labour for finishing to required shape and size, setting, fitting and fixing in position.
3. Though separate rate for centering, shuttering and form work has been specified in respect of this chapter, however in principle all the rates given in this chapter are inclusive of formwork..
4. In case of canal structures (or bridges) on well or pile foundations the following definitions shall apply:-
 - (a) Foundations- All works below ground level or low water level, whichever is higher, but not above soffit level shall be termed as foundation.
 - (b) Sub-structure- The part of the bridge (or canal structure) below soffit level of the deck slab/beam but above the foundation level as defined in (a) above, shall be taken as sub-structure of the bridge (or canal structure) part.
 - (c) Superstructure:- The work above soffit level for deck slabs/beams including centering and shuttering (formwork) required for the superstructure , Krebs, railings expansion joints, beams, slabs, etc., shall be termed as superstructure of the bridge (or canal structure) part.
5. The rates for well sinking given in item 2409 include the cost of diversion channel, islands, if required to be done for laying the cutting edge and Krebs and staining. Tilt and shift in well in its final well position shall not be more than 1/60 and 15cm respectively The rates also include the cost of rectification of tilt and shift in excess of 1/60 and 15 cms respectively.
6. The rates of well sinking given in item 2409 are the complete rates for well sinking operation, which may be carried out by either mechanical dredging, chiselling, sinking with or without dewatering , and with or without coffer damming, etc., or by manual dredging and dewatering of the well.
7. The 'H' type R.C.C. railing given in item 2447 shall be provided as per drawing No.4 CDO/STD, contained in E-in-C Technical. Circular No. 78-185-CDO-78, dated 17-1-1978 (Typical drawings of precast components of canal structures).
8. The bearings shall conform to section No. 2000 of "Specifications for road and bridge works (first revision) of Ministry of shipping and Transport (Roads wing)"

9. Measurement – (a) Concrete in well steining shall be measured by multiplying the cross sectional area of the steining by the height of the steining as actually cast.
- (b) Measurement for the reinforcement and other steel items shall be made as specified in chapter 13 Steel and Iron-work.
- (c) Measurement for the R.C.C. shall be made as specified in chapter 16-R.C.C. and Form-work.
- (d) Cement concrete in piles shall be measured in cum, arrived at by multiplying the cross sectional area of the pile by the length of the pile as cast from the head of the pile to the tip of shoes.
- (e) The filling in the well shall be measured on the cross-sectional area of the dredge hole multiplied by the height of the fill.
10. The following Indian Standards and Indian Road Congress publications may be referred to :-

I.S.No.	Title
458-2003	Concrete pipes (with or without reinforcements) (fourth revision)
783-1985	Code of practice for laying of concrete pipes (Re 2007)
1322-1993	Bitumen felts for water proofing and damp proofing (second revision) (with amendment Nos. 1 and 2) (Re 2003)
1343-1980	Code of practice for prestressed concrete (with amendment Nos.1 and 2). (Re 2004)
1838-1961 Part II	Preformed fillers for expansion joints in concrete non-extruding and resilient type (bitumen impregnated fiber). (Re 2000)
2911-	Code of practice for design and construction of pile foundations-
2911 (part I/sec.1)-1979	Concrete piles, section 1, Driven cast in-situ concrete piles (first revision). (Re 2002)
2911 (Part 1/Sec.2)-1979	Concrete piles, section 2, Bored cast- in situ piles (first revision). (Re 2002)
2911 (part 1/Sec. 3)-1979	Concrete piles, section 3, driven precast concrete piles (First revision) (Re 2002)
2911 (part IV)-1979	Load test on piles. (Re 2002)
3955-1967	Code of practice for design and construction of well foundations (with amendment No.1) .
5121-1969	Safety code for piling and other deep foundations (Re 2005)
6003-1983	Indented wire for prestressed concrete (with amendment Nos. 1 and 2). (Re 2003)
6006-1983	Uncoated stress relieved strand for prestressed concrete (with amendment Nos.1 and 2). (Re 2003)
6426-1972	Pile driving hammer. (Re 2005)
6427-1972	Glossary of terms relating to pile driving equipment. (Re 2005)

6428-1972	Pile frame (Re 2005)
6751-1972	Aluminum alloy casting and strips for bearing (Re 1999)
7623-1993	Lithium soap greases (Re 2006)
IRC-21-2000	Standard specification and code of practice for Road Bridges (section-(iii) cement concrete (Plain and reinforced).
IRC-45-1972	Recommendations for estimating the resistance of soil below the maximum scour level in the design of well foundation of bridges.

Item No.	Item	Unit	Rate	Remarks
GENERAL ITEM-				
2401	Carrying out load test on foundation of wells, including preparing for necessary loading platform, loading bags or pigs etc., unloading, arrangement recording, depositing the materials as directed etc., complete.	one tonne load	625.00	
Foundations:-				
2402	Providing and filling in foundations cement concrete 1:2:4 with graded metal of maximum size 40mm, laid under water in open foundation pits by skip boxes or tremie pipes including ramming, leveling, etc., complete with 10 percent extra cement.	cum	3188.00	
2403	Labour only form item 2402	cum	638.00	
2404	Providing, fabricating, launching and grounding in position, floating steel curbs wells and steining for wells including necessary bracing, cutting, edges including all necessary plants etc., complete.	tonne	83055.00	
2405	Filling in the hollow of the steel floating curbs and steining with 1:2:4 cement concrete mix, with graded metal of maximum size 20mm, including vibrating, curing, etc. complete.	cum	3186.00	
2406	Providing, fabricating and setting out steel well cutting edges of R.C.C. well curb including timber planking, leveling, etc., complete.	tonne	71190.00	
2407	Providing and casting insitu cement concrete for R.C.C. work for well curbs, piles, well caps, steining including laying, vibrating curing etc. with graded metal of maximum size 20mm (excluding cost of reinforcement and form work)			

Item No.	Item	Unit	Rate	Remarks
	(a) M-15 concrete	cum	3186.00	
	(b) M-20 concrete	cum	3689.00	
2408	Labour only for-2407 (a) & (b)	cum	616.00	
2409	Sinking of wells for foundation to levels as per drawing including dredging, dewatering and drop chiseling as may be necessary, including sinking by loading with necessary, Kent ledges and other usual means for the type of work including all the plant and machinery etc; complete in all kinds of soils and removal of boulders or tree trunks up to 0.03 cum average volume except sinking in rock and removal of boulders more than 0.03 cum volumes, etc. Complete:-			Measured form the top of cutting edge angle to bottom of well cap or L.W.L. which ever is lower.
	(a) up to 3m depth	cum	1206.00	
	(b) Add for each 3m extra depth beyond 3m up to 24m depth	cum	530.00	
	(c) Beyond 24 m depth.	cum	5613.00	
2410	Same as in item 2409 but sinking of wells in soil above L.W.L.	cum	603.00	Measurement will be taken form L.W.L. to bottom of well cap or round level which ever is lower.
2411	Sinking wells as in Item 2409 but in soft or hard rock.	cum	200% extra over item 2409	
2412	(a) Providing minimum 30 cm deep sump well in hard in well foundation.	cum	13778.00	
	(b) Providing minimum 60cm deep sump well in soft rock in well foundation.	cum	8267.00	
2413	Providing and fixing 25mm dia, 1.5m deep in rock and 1.5 m above rock, mild steel dowel bars in open foundations including drilling 65mm dia bore holes in rock and grouting including necessary bending, hooking, tying reinforcement in position, cement mortar etc., complete	per bar	1081.00	
2414	Labour only for item 2413	per bar	155.00	
2415	Same as item 2413 but inside well foundation in bottom plug.	per bar	2496.00	
2416	Labour only for item 2415	per bar	291.00	

Item No.	Item	Unit	Rate	Remarks
2417	Providing and laying underwater cement concrete 1:2:4 mix, with 40mm graded metal, for bottom plug for wells, in open or by tremie pipe or skip boxes including ramming, curing, etc., complete with 10 percent extra cement.	cum	3940.00	
2418	Labour only for item 2417	cum	1121.00	
2419	Providing and filling in wells, in between the top and bottom plugs with available good sand, including compacting by suitable methods etc. complete.	cum	328.00	
2420	Driving or boring R.C.C. piles of the specified design as per detailed drawings for foundations to required levels, including all necessary plants and machinery for the type of work involved cutting and load testing as per specifications and any other protection work for bores if required etc., complete (excluding cost of reinforcement)-			
	(a) Up to 6m depth per cum volume of the pile	cum	5665.00	
	(b) Add for each meter extra depth below 6m. Sub-structure :-	cum	567.00	
2421	Providing and cast in-situ, cement concrete for R.C.C. cork in sub-structure, including laying, vibrating, curing and finishing etc., complete, with graded metal of maximum size of 20mm (excluding cost of reinforcement and form work)-			
	(a) M-15 concrete	cum	2897.00	
	(b) M-20 concrete	cum	3353.00	
2422	Labour only for item -2421(a) & (b)	cum	474.00	
2423	Providing cement concrete cast in-situ for piers, abutments returns/wings including providing V-shape false joints to form suitable panels in exposed faces to approved design including laying, vibrating, curing, finishing etc complete, with graded metal of maximum size 40mm (excluding cost of form work)			
	(a) 1:3:6 concrete	cum	2327.00	
	(b) 1:2:4 concrete	cum	2869.00	

Item No.	Item	Unit	Rate	Remarks
2424	Extra rate for every additional 3m height or part thereof above well cap (for items 2421 & 2423).	cum	77.00	
2425	Providing and fixing cast steel roller or rocker bearing as per approved design including with machined surface, testing etc.	kg	195.00	
2426	Providing and fixing mild steel roller or rocker bearing or plate bearing as per approved design.	kg	104.00	
2427	Providing and fixing copper alloy (70:50:20) plate bearings as per approved design.	kg	692.00	
2428	Providing and fixing stainless steel plate bearing (stainless steel 18:8 specification)	kg	692.00	
2429	Labour only for item 2425 to 2428	kg	14.00	
2430	Providing R.C.C. roller and rocker bearing, R.C.C. hinges as per approved design excluding lead sheet, but including reinforcement, form-work etc. complete.	cum	25844.00	
2431	Cost of item 2430 excluding cost of steel	cum	4627.00	
2432	Providing and fixing lead sheets for R.C.C. bearings.	kg	136.00	
2433	Providing elastomeric bearings such as restrained neoprene bearings or any other type with mild steel plates or shims, manufactured as per specifications given in the approved design of the bearings, including-packing, fixing with adhesives as specified in the design etc. complete.	cubic centi meter	1.50	
2434	Providing and fixing A.C. pipe with grating for weep holes in abutments, wing walls and return walls-			
	(a) 100 mm dia	m	182.00	
	(b) 150 mm dia	m	254.00	
2435	Providing and fixing in position grease boxes of approved design for the bearings (excluding the cost of grease).	kg	100.00	
2436	Providing and filling in the grease boxes	kg	141.00	
2437	Providing and fixing in position, 12mm thick premoulded fillers non-extruding and resilient type (bitumen-impregnated fiber), IS:1838-1961, on the pier cap including cleaning of surface etc complete.	sqm	1942.00	

Item No.	Item	Unit	Rate	Remarks
2438	Providing and fixing in position Hessian base bitumen felts 2.23 kg per sqm type 3 grade-I, IS: 1322-1970. Below bearing or R.C.C. slabs over abutment and pier etc., complete.	sqm	828.00	
Super-structure :-				
2439	Providing and casting in-situ, controlled concrete for R.C.C. and prestressed concrete work including weigh batching, ramming, vibrating, finishing, curing, cleaning etc. complete (excluding cost of reinforcement and formwork)-			
	(a) M-15 concrete	cum	3564.00	
	(b) M-20 concrete	cum	4085.00	
	(c) M-25 concrete	cum	4646.00	
	(d) M-30 concrete	cum	4878.00	
	(e) M-35 concrete	cum	5122.00	
	(f) M-40 concrete	cum	5378.00	
	(g) M-45 concrete	cum	5647.00	
2440	Labour only for item 2439	cum	709.00	
2441	Providing and fixing in position, to exact profile and prestressing high tensile steel of specified ultimate strength, including bending, cutting, tying and providing anchorage, sheathing materials, cable ducts etc, complete as per detailed drawings.	tonne	132469.00	
2442	Same as above but excluding cost of high tensile steel.	tonne	58969.00	
2443	Providing and laying in position cement concrete with graded metal of maximum size 20mm for 75mm thick (average) wearing coat over bridge slabs, laid in alternate panels to the required camber, including formwork, tamping, vibration, finishing, curing etc. complete including cleaning R.C.C. surface and applying cement slurry (2kg per sqm) before laying concrete-			
	(a) 1:2:4 concrete	cum	3993.00	
	(b) 1:1.5:3 concrete	cum	4514.00	

Item No.	Item	Unit	Rate	Remarks
2444	Providing and laying in-situ cement concrete for R.C.C. work including curing, finishing etc. complete with graded metal of maximum size 40mm (excluding cost of reinforcement and form work)-			
	(a) 1:2:4 concrete	cum	2897.00	
	(b) 1:1.5:3 concrete	cum	3353.00	
2445	Labour only for item 2444	cum	474.00	
2446	Providing structural steel work for the super structure of bridges including cutting, riveting, bolting or welding as per the approved design including hoisting in position etc. complete.	tonne	64368.00	
2447	Providing and fixing in position 76.5cm high H type 1:2:4 RCC railing with graded metal of maximum size 12.5 mm over kerbs consisting of 74.5x28x6.5cm precast panels 15x11cm precast hand rails, 81.5x20x20 cm pillars as per approved drawing including vibration, finishing, curing, handling and hoisting etc. complete including cost of form work and reinforcement.	m	1187.00	
2448	Cost of item 2447 excluding the cost of steel.	m	761.00	
2449	Providing and fixing in position 1m high pipe railing with 3 rows of 40mm G.I. pipes and R.S.J. posts (ISLB-75@6.1kg/m) as per approved drawing No.T/SH/9-A (E-in-C, P.W.D.) including 3 coats of painting etc. complete.	m	1197.00	
2450	Providing and fixing in position 0.9m high collapsible railing as per approved drawing No. T/SH-8 (E-in-C, P.W.D.) including 3 coats of painting etc. complete.	m	1347.00	
2451	Providing 150mm, dia cast iron pipes for water pouts, including fixing in position and providing and fixing necessary cast iron grating, etc. complete, as per approved design.			
	(a) Up to 30cm length	each	552.00	
	(b) For additional length per centimeter	cm	9.00	

Item No.	Item	Unit	Rate	Remarks
2452	Providing 150mm dia A.C. pipe for water spouts, including fixing in position and providing and fixing necessary cast iron grating, etc. complete-			
	(a) Up to 30cm length	each	256.00	
	(b) For additional length per centimeter	cm	2.00	
2453	Providing and laying in position cement concrete with graded metal of maximum size 40mm for in situ concrete blocks in drainage bed, laid alternately, including form work, vibration, tamping, finishing, curing cleaning of joints etc., complete-			
	(b) 1:3:6 concrete	cum	2847.00	
2454	Providing and fixing in position 12mm thick premoulded fillers non extruding and resilient type (bitumen impregnated fiber, I.S.1838-1961), in expansion joints including cleaning of surface etc. complete.	sqm	1610.00	
2455	Providing and laying in position cement concrete with graded metal of maximum size 20mm for coping over walls, laid in alternate panels of 1.5m, including form work, tamping, vibration, finishing, curing, cleaning etc. complete -			
	(a) 1:2:4 concrete	cum	3799.00	
	(b) 1:3:6 concrete	cum	3342.00	
2456	Testing of one span of bridges/canal structure for deflection due to live load with platform for loading arrangement, apparatus for measurement, including unloading etc. complete.	per tonne	739.00	
2457	Carrying out water tightness test of R.C.C. trough of canal aqueduct by constructing water tight walls at the entrance and exit ends of the through including filling of trough with water up to F.S.L. by pumping observing loss of head in 24 hours. And draining off of water after testing is over, including removal of wall etc. complete.			
	(a) first span	per cum of water filled	217.00	

Item No.	Item	Unit	Rate	Remarks
	(b) add for subsequent span	per cum of water filled	108.00	
2458	Fixing in the position NP2 Hume pipes for bridges and canal structures including handling, toeing, filling the joints with filler materials and cement mortar 1:3 curing etc. complete (excluding cost of pipes & collars)			
	(a) 80mm dia	m	65.00	
	(b) 100 mm dia	m	66.00	
	(c) 150 mm dia	m	66.00	
	(d) 250 mm dia	m	69.00	
	(e) 300 mm dia	m	91.00	
	(f) 350 mm dia	m	115.00	
	(g) 400 mm dia	m	136.00	
	(h) 450 mm dia	m	164.00	
	(i) 500 mm dia	m	181.00	
	(j) 600 mm dia	m	229.00	
	(k) 700 mm dia	m	277.00	
	(l) 750 mm dia	m	303.00	
	(m) 800 mm dia	m	324.00	
	(n) 900 mm dia	m	349.00	
	(o) 1000 mm dia	m	410.00	
	(p) 1100 mm dia	m	453.00	
	(q) 1200 mm dia	m	501.00	
2459	Fixing in position NP3 Hume pipes for bridge or canal structure including handling, toeing, filling the joints with filler materials and cement mortar 1:3 curing etc. complete (excluding cost of pipes)-			
	(a) 350 mm dia	m	147.00	
	(b) 400 mm dia	m	172.00	
	(c) 450 mm dia	m	199.00	
	(d) 500 mm dia	m	228.00	
	(e) 600 mm dia	m	291.00	
	(f) 700 mm dia	m	362.00	

Item No.	Item	Unit	Rate	Remarks
	(g) 800 mm dia	m	420.00	
	(h) 900 mm dia	m	446.00	
	(i) 1000 mm dia	m	524.00	
	(j) 1100 mm dia	m	573.00	
	(k) 1200 mm dia	m	656.00	
2460	Guiniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per technical specification	sqm	1853.00	
2461	Rectification of bearing as per technical specification including lifting of super structure by jacking up from below that is by placing the jacks on pier/abutment.	each	10755.00	
2462	Providing strip seal type of expansion Joint complete as per drawing and specification as per clause 2607 to 2610 including acceptance testing as specified, to be installed under supervision of specialist manufacturer as per section 2600 of M.O.R.T. & H's "standard specification for road & bridge works(fourth revision).	RM	15620.00	
2463	Replacement of expansion joints complete as per drawings (Removal of old expansion joint, including replacement of broken concrete).	RM	2292.00	
2464	Providing & supplying epoxy under water (coverage area 1sqm/kg for two coat) for leak proofing epoxy including cost of all other materials with all lead & Lifts etc.	sqm	3110.00	
2465	Providing structure sealing joint system (arrow) for bridges, elevated highways, water retaining structures of all type and other engineering structures:-			
	(a) Providing inside of barrel/structures by model MC-1,70mm thickness inclusive of fixing of charges.	RM	4199.00	
	(b) Providing outside of barrel/structures by model MC-2, 50mm thickness inclusive of fixing of charges.	RM	3426.00	

CHAPTER 25 - CANAL LINING

Notes-

1. Rates include
 - (a) Lead up to 100 m for all materials unless otherwise specified.
 - (b) Cost of all materials including cost of water.
 - (c) All lift for all materials.
 - (d) Mixing of concrete in mixer.
 - (e) Cost of curing.
2. Lead for flagstones shall be measured from the nearest railway station or market place whichever is nearer.
3.
 - (a) Rates for concrete items are for metal other than black trap, basalt or granite.
 - (b) Blasting charges for metal used for concrete items are payable as per item 514 for the quantity required vide Appendix-1.
 - (c) Extra rate for use of black trap, basalt or granite for concrete items shall be payable as per item 733.
4. The LDPE film, sealing compound and primer shall bear ISI Mark in accordance with Indian Standards Institution (Certification Marks) Act 1952.
5. The precast slabs shall be casted at suitable centralised places using table vibrator and ensuring quality control of concrete and proper curing arrangement. The flexural strength of precast slabs shall be tested in accordance with IS: 4969-1968.
6. Measurements: -
 - (a) Dimensions shall be measured correct to the nearest cm. The area shall be calculated in sqm correct to two places of decimal and cubical contents in cum correct to two places of decimal.
 - (b) No deductions shall be made for the following:-
 - (i) Volume occupied by reinforcement; and
 - (ii) Opening up to 0.1 sqm in area;
7. The following Indian Standards may be referred to:-

I.S.No.	Title
651-1998	Salt glazed stoneware pipes and fittings (fifth revision). (Re 2003)
1398-1982	Packing paper, water proof, bitumen laminated (first revision) (with amendments 1 to 3) (Reaffirmed 1994).
2505-1992	General requirement for concrete vibrators immersion type (third revision) (Re 2004)
2506-1985	Screed board vibrators. (Re 2005)
2508-1984	Low density polyethylene films (second revision). (Re 2003)
2514-1963	Concrete vibrating tables. (Re 2001)
3872-2002	Code of Practice for lining of canals with burnt clay tiles.
3873-1993	Code of Practice for laying in-situ cement concrete lining on canals (second revision). (Re 2004)

4031-1991 (Part I to XV)	Methods for physical tests for hydraulic cement (First revision) (Re 2005)
4515-2002	Code of Practice for boulder lining for canals.
4558-1995	Code of Practice for under-drainage of lined canals. (Re 2006)
4575-1983	Code of Practice for design of cross-section of lined canals (with amendments 1&2) (Re 2005)
4926-2003	Specification for ready mixed concrete (IInd Revision)
5256-1992	Code of practice for sealing joints in concrete lining on canals. (Re 2003)
5690-1982	Guide for laying combination lining for existing unlined canals (with amendment No.1). (Re 2004)
5889-1994	Vibratory plate compactor (with amendment No.1) (Re 2005)
7245-1974	Specification for concrete pavers. (Re 2001)
7246-1974	Recommendations for use of table vibrators for consolidating concrete. (Re 2004)
9013-1978	Methods for making, curing & determining compressive strength of accelerated cured concrete test specimens. (Re 2004)
9451-1980	Guide lines for lining of canals in expansive soils. (Re 2004)
9698-1995	Code of practice for lining of canals with low density polyethylene film. (Re 2001)
10430-2000	Criteria for design of Lined canals and Guidance for selection of type of lining (Reaffirmed 2004)
10646-1991	Method of test for determining flexural strength of pre-cast cement concrete slabs for canal lining. (Reaffirmed 2004)
12379-1988	Code of practice for lining in water courses and field channels. (Reaffirmed 2003)
13143-1991	Specification on joints in concrete lining of canals-sealing compounds. (Reaffirmed 2004)
15351-2003	Textiles-laminated high density polyethylene (HDPE) fabric for canal lining

Item No.	Item	Unit	Rate	Remarks
2501	Excavation in different types of soil and rocks in canal bed and side slopes for lining, sleepers, coping and under drainage arrangement including dressing to the profile and disposal or excavated material with 50m lead and 1.5m lift.	cum	10% above the rates given in chapter 4	
2502	Tamping in canal bed and sides including saturation up to 30cm depth for preparation of earthen sub-grade before laying in-situ cement concrete lining.	sqm	14.00	
2503	(a) Providing and laying free draining sand below lining in canal bed and side slopes including compaction as per specification.	cum	113.00	

Item No.	Item	Unit	Rate	Remarks
	(b) Providing and laying filter materials for drains consisting of sand and gravel of nominal size 10mm, 20mm and 40mm.	cum	303.00	
2504	Providing and fixing in position 15cm dia salt glazed stone ware pipes IS:651-1980 grade AA with open joints in longitudinal drain below lining.	m	220.00	
2505	Providing and laying bitumen laminated waterproof paper I.S.:1398-1982 (Type1) over top of drains and sand surface before laying in-situ cement concrete lining.	sqm	19.00	
2506	Providing and fixing in position R.C.C. cylindrical boxes and covers at outlet in longitudinal drains I.S.:4558-1968 precast cement concrete 1:2:4 with 12.5mm graded stone ballast excluding cost of reinforcement but including form work, vibration, finishing, curing etc., complete.	cum	3995.00	
2507	(A)Providing and placing in position cement concrete 1:3:6 with 40mm graded stone ballast for in-situ sleepers including form work, vibration, finishing, curing, cleaning, etc., complete in-			
	(a) Canal bed	cum	3012.00	
	(b) Canal side slopes	cum	3083.00	
	(B) Providing and placing in position cement concrete 1:2:4 with 40mm graded stone ballast for in-situ sleepers including form work, vibration, finishing, curing, cleaning, etc., complete in-			
	(a) Canal bed	cum	3473.00	
	(b) Canal side slopes	cum	3544.00	
2508	(A)Providing and fixing in position R.C.C. sleepers precast in cement concrete 1:3:6 with 40mm graded stone ballast fixing in canal side slopes excluding cost of steel but including form work, cleaning, vibration, handling and hoisting etc., complete.	cum	2879.00	
	(B) Providing and fixing in position R.C.C. sleepers precast in cement concrete 1:2:4 with 40mm graded stone ballast fixing in canal side slopes excluding cost of steel but including form work, cleaning, vibration, handling and hoisting etc., complete.	cum	3340.00	

Item No.	Item	Unit	Rate	Remarks
2509	Providing and fixing in position ladder rungs I.S.3873 of 25mm dia 2050 mm long MS bars including bending to the required shape smoothening, painting of exposed surface after installation with anticorrosive bituminous paint.	each	372.00	
2510	(A)Providing and placing in position cement concrete 1:3:6 with 40mm graded stone ballast for safety ladder IS:3873 including form work, vibration finishing making 10mm wide grooves, curing, cleaning etc., complete.	cum	2868.00	
	(B)Providing and placing in position cement concrete 1:2:4 with 40mm graded stone ballast for safety ladder IS:3873 including form work, vibration finishing making 10mm wide grooves, curing, cleaning etc., complete.	cum	3329.00	
2511	(a) Painting top of sleepers with two layers of sealing compound, ISI Mark 5256, fist layer at the rate of 1 liter per 2 sqm and second layer at the rate of 1 liter per 4 sqm inclusive of cost of all materials.	sqm	90.00	
	(b) Painting of vertical faces of in-situ cement concrete lining panels with sealing compound ISI Mark-5256 at the rate of 1 liter per 4 sqm inclusive of cost of all materials.	sqm	35.00	
2512	(a) Providing and placing in position cement concrete 1:3:6 with 40mm graded stone ballast for in-situ lining in canal bed including form work for laying in panels, vibration finishing, making grooves as per IS.3873, finishing curing for 28 days, cleaning etc., complete.	cum	2243.00	
	(b) Providing and placing in position cement concrete 1:3:6 with 40mm graded stone ballast for in-situ lining in canal side slopes including form work for laying in panels, screeding the surface of side slopes with winch operated slip form, finishing making grooves as per IS: 3873, finishing, vibration curing for 28 days by constructing brick masonry drains with weep holes or perforated pipes on the coping at the top of lining or by sprinklers, cleaning etc. complete.	cum	3441.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Providing and placing in position cement concrete 1:3:6 with 20mm graded stone ballast for in-situ lining in canal bed including form work for laying in panels, vibration finishing, making grooves as per IS.3873, finishing curing for 28 days, cleaning etc., complete.	cum	2311.00	
	(d) Providing and placing in position cement concrete 1:3:6 with 20mm graded stone ballast for in-situ lining in canal side slopes including form work for laying in panels, screeding the surface of side slopes with winch operated slip form, finishing making grooves as per IS:3873, finishing, vibration curing for 28 days by constructing brick masonry drains with weep holes or perforated pipes on the coping at the top of lining or by sprinklers, cleaning etc. complete.	cum	3509.00	
2513	(a) Providing and placing in position reinforced cement concrete 1:3:6 with 40mm graded stone ballast for in-situ lining in canal side slopes including form work, for laying in panels, screeding the surface of side slopes with winch operated slip form, finishing, making grooves as per IS:3873, curing for 28 days by constructing brick masonry drains with weep holes or perforated pipes on the coping at the top of lining or by sprinklers, cleaning etc. complete.	cum	3646.00	
	(b) Providing and placing in position reinforced cement concrete 1:2:4 with 40mm graded stone ballast for in-situ lining in canal side slopes including form work, for laying in panels, screeding the surface of side slopes with winch operated slip form, finishing, making grooves as per IS:3873, curing for 28 days by constructing brick masonry drains with weep holes or perforated pipes on the coping at the top of lining or by sprinklers, cleaning etc. complete.	cum	4106.00	
2514	Filling contraction joints (grooves) as per IS:3873 with hot applied sealing compound IS:5256 including cleaning and washing grooves, painting its inner surfaces with primer IS:3384 at the rate of 1 litre per 4			

Item No.	Item	Unit	Rate	Remarks
	sqm inclusive of cost of all materials for in-situ concrete lining-			
	(a) Groove of 17 mm depth	m	22.00	
	(b) Groove of 20 mm depth	m	26.00	
	(c) Groove of 27 mm depth	m	36.00	
	(d) Groove of 30 mm depth	m	37.00	
	(e) Groove of 33 mm depth	m	40.00	
2515	Providing and fixing flap valves in drains	each	497.00	
2516	Providing and fixing in position pressure relief valves of size 150mm IS:4558 for outlets in longitudinal drains in canal bed as per specifications inclusive of cost of all materials	each	14439.00	
2517	Providing and placing in position burnt clay tiles for lining of canal as per IS:3872	sqm	262.00	
2518	Providing boulder lining for canals as per IS:4515			
	(a) 150 mm thickness	cum	290.00	
	(b) 225 mm thickness	cum	322.00	
	(c) 300 mm thickness	cum	354.00	
2519	Providing and laying flag stone lining for canals including average 20mm thick bedding of cement mortar 1:6 including pointing in cement mortar 1:3 striking joints, curing and cleaning etc. complete-			
	(a) 20 to 25 mm thick flag stone	sqm	290.00	
	(b) 30 to 40 mm thick flag stone	sqm	315.00	
	(c) 40 to 50 mm thick flag stone	sqm	364.00	
2520	(a) Providing and fixing in position LDPE film of 150 Micron (0.15mm) ISI Mark 2508 (Grade 231), including heat-sealed joints at ends as per IS:9698-	sqm	25.00	
	(b) Labour only for item 2520 (a)	sqm	6.00	
2521	Providing and fixing in position precast concrete slabs for canal lining, precast in M-10 controlled cement concrete with Graded stone ballast of maximum size 20mm conforming to IS:3860 laid over 15mm thick bed of cement mortar 1:5 and			

Item No.	Item	Unit	Rate	Remarks
	in joints including form work for precasting vibration, curing handling, hoisting etc. complete inclusive of cost of mortar -			
	(a) Precast slab of 60mm thickness	sqm	304.00	
	(b) Precast slab of 50mm thickness	Sqm	296.00	
2522	Providing and fixing in position precast concrete slabs of 30x30x3cm size for canal lining in M-15 design mix concrete with graded stone ballast of maximum size 12.5 mm over 12mm thick bed of cement mortar 1:5 and in joints including form work for precasting, vibration, curing, handling, hoisting etc. complete including of cost of mortar.	sqm	233.00	
2523	Fixing in position NP1 & NP2 half round Hume pipes for canal lining (for water courses & field channels) including handling toeing, filling the joints with filler materials and cement mortar 1:3 curing etc. complete (excluding cost of pipes collars)			
	(a) 80 mm dia (NP1)	m	28.00	
	(b) 100 mm dia (NP1)	m	28.00	
	(c) 150 mm dia (NP1)	m	38.00	
	(d) 250 mm dia (NP1)	m	30.00	
	(e) 300 mm dia (NP1)	m	39.00	
	(f) 350 mm dia (NP1)	m	50.00	
	(g) 400 mm dia (NP1)	m	59.00	
	(h) 450 mm dia (NP1)	m	69.00	
	(i) 500 mm dia (NP2)	m	80.00	
	(j) 600 mm dia (NP2)	m	99.00	
2524	Providing plain cement concrete lining of M-10 grade (1:3:6 with 20mm graded stone ballast)with paver machine in bed, side slope and curvature, including batching, mixing transporting, placing, vibrating inserting PVC, stripes at joints, smooth finishing curing, (P.V.C. strips payable separately,			
	(i) Lining in bed, (with water curing)	cum	2747.00	
	(ii) Lining in slope and curvature (with membrane curing)	cum	3141.00	

Item No.	Item	Unit	Rate	Remarks
2525	Providing plain cement concrete lining of M-15 grade (1:2:4 with 20mm graded stone ballast) with paver machine in bed, side slope and curvature, including batching, mixing, transporting, placing, vibrating inserting PVC, stripes at joints, smooth finishing curing, (P.V.C. strips payable separately,			
	(i) Lining in bed, (with water curing)	cum	3332.00	
	(ii) Lining on slope and curvature (with membrane curing)	cum	3613.00	
2526	Machanised trimming of the canal section for preparing sub grade for sub laying concrete lining in all sorts of soils and moorum and back filling the over excavated rock section if any with lean concrete including watering and compacting bed and side slope using slope compactors including back filling and de-watering where ever required.	sqm	16.00	Payable for item No. 2524 & 2525
2527	Providing and fixing in position P.V.C. strips in panel joints in lining work, using mechanical contrivance, smooth finishing etc. complete.	R.M.	127.00	Payable for item No.2524 & 2525
2528	Providing and laying of PVC corrugated perforated pipes conforming IS-9271 with synthetic filter envelope including joints, providing and laying sand filter blanket around the drain pipe including grading and compaction including excavation in soft or ordinary soil etc. complete as per specifications.			
	(i) 72 mm inner dia/80 mm outer dia	meter	154.00	
	(ii) 88 mm inner dia/100 mm outer dia	meter	201.00	
	(iii) 144 mm inner dia/160 mm outer dia	meter	439.00	
	(iv) 178 mm inner dia/200 mm outer dia	meter	735.00	

Item No.	Item	Unit	Rate	Remarks
2529	Providing and laying of PVC corrugated perforated pipes conforming IS-9271 with synthetic filter envelope including joints, providing and laying sand filter blanket around the drain pipe including grading and compaction including excavation in hard soil etc. complete as per specification.			
	(i) 72 mm inner dia/80 mm outer dia	meter	156.00	
	(ii) 88 mm inner dia/100 mm outer dia	meter	201.00	
	(iii) 144 mm inner dia/160 mm outer dia	meter	441.00	
	(iv) 178 mm inner dia/200 mm outer dia	meter	737.00	
2530	Providing and laying of PVC corrugated perforated pipes conforming IS-9271 with synthetic filter envelope including joints, providing and laying sand filter blanket around the drain pipe including grading and compaction including excavation in hard moorum and moorum with boulder etc. complete as per specification.			
	(i) 72 mm inner dia/80 mm outer dia	meter	156.00	
	(ii) 88 mm inner dia/100 mm outer dia	meter	203.00	
	(iii) 144 mm inner dia/160 mm outer dia	meter	443.00	
	(iv) 178 mm inner dia/200 mm outer dia	meter	739.00	
2531	Providing and laying approved cohesive non swelling (C.N.S.) soil in canal bed and slops including dressing breaking of clods, laying in layers of 15 cm thick horizontally, pride cutting and finish, including 50m lead and 1.5m lift.	cum	159.00	

CHAPTER 26 – SUPPLY AND ERECTION OF GATES

Notes:-

1. The rates include:
 - (a) all lead and lift and cost of all materials and labour, for all items.
 - (b) 1/5 cost of hydraulic jacks, for item 2602 (d)
 - (c) hydraulic test, trial and commissioning.
2. The gates are classified on the basis of head above sill level as follows:-
 - (a) High head gate-A gate which operates under a head of 30 m and above.
 - (b) Medium head gate-A gate which operates under a head of 15 m and above, but less than 30 m; and
 - (c) Low head gates- A gate which operates under a head of less than 15 m.
3. The gates shall be designed taking into consideration the recommended design criteria and the materials used for different components shall confirm to the relevant I.S.
4. Canal gates of small size: - (a) the small gates shall be square or rectangular in shape. The size of square opening shall be 300, 450, 600, 750, 900, 1050 and 1200 mm and that of rectangular 1200 mm (width) x 900 mm (depth).
 - (b) The hoisting capacity and the dia. of the lifting rod shall be determined by taking into consideration the operating head under which the gate is to be closed. The type and capacity of the head stock and dia. of hand wheel should be sufficient to enable operation of gate under the maximum operating head by a single person with an effort on the rim of hand wheel not exceeding 136 Newton.
 - (c) The exact length of lifting rod, number of rods, guide-brackets and number of rod COUPLINGS required shall be determined considering distance from centre line of water way opening to the top of operating platform or distance from the bottom sill of gate to the top of operating platform.
 - (d) The materials used for different components shall be as specified below:-

S.No.	Component Part	Material	Specification
1.	Head stock body, wedge, blocks guide brackets, thrust nut, stem coupling.	Grey cast iron Grade 20	IS:210
2	Stem (spindle), Gate, frame shutter.	Structural steel	IS:2032
3	Stem nut.	Cast brass	IS:28
4	Seating face (seat facings)	Brass	IS:410
5	Assembly bolts & nuts, wedge, clamping, adjustment bolts and nut.	Electro Galvanized Mild steel	
6	Anchor bolt	Mild steel	IS:1367
7	Paint gate.	Epoxy paint	IS:14177
8	Paint for head-stock.	Enamel paint	

- (e) The gates shall be shop tested. The gate shall be reasonably water tight, the maximum permissible leakage being not more than 5 lit./min./meter length of seal in case of low and medium head gates and 10 lit./min./meter length of seal in case of high head gates.

5. Nominal sizes and Dimensions of single faced sluices shall be as specified below:-

Sr. No.	Shape	Size	Ref. to fig. As per table-2 page 26-67& fig. Page 26-93 to 26-97 of Sp. Vol.-IV
1	Circular	(a) 200 to 600 (b) 200 to 1200	4 A(1), 4 B(1) 4 C(1), 4 D(1)
2	Square	(a) 200 to 600 (b) 200 to 1200	4 A(2), 4 B(2) 4 C(2), 4 D(2)
3	Rectangular	300x375 to 1200x1050	4E

6. Approximate weight of canal and tank gates as per standard size, rod size and rod length shall be taken as below :-

(A) Canal Gates (1.5 Meter Rod Length)

Size of Gate (in mm)	Rod Size (Spindle Dia)	Approximate weight (in Kg.)
300 x 300 mm	40 mm	150 Kg.
450 x 600 mm	48 mm	240 Kg.
600 x 600 mm	55 mm	320 Kg.
900 x 900 mm		500 Kg.

(B) Tank Gate (10 Meter Rod length) (Up to 15 meter water head)

Size of Gate (in mm)	Rod Size (Spindle Dia)	Approximate weight (in Kg.)
300 x 300	40 mm	180 Kg.
450 x 450	48 mm	275 Kg.
600 x 600	55 mm	400 Kg.
750 x 750	58 mm	410 Kg.
900 x 900	60 mm	550 Kg.

(C) Weight of Automatic Outflow Regulating Gate

Size of Gate	Approximate weight per sqm (in Tonne)
(i) 1 to 10 sqm	1.20 Tonne
(ii) 10 to 20 sqm	1.40 Tonne
(iii) 20 to 50 sqm	1.80 Tonne
(iv) 50 to 75 sqm	2.00 Tonne

- (D) **Weight of 1 vertical lift gate** including embedded parts in tones
 $= 0.1332 \times (L^2 \times H \times h)^{0.659}$
(L) is length = Clear vent width in m+ 0.50 m.
(H) is height of gate in m = Clear vent height in m+0.20 m
(h) is head of water of water above sill of gate in m = FSL - Sill level
- (E) **Weight of 1 radial gate** including embedded parts in tones $= 0.0887 \times (L^2 \times H \times h)^{0.673}$
(L) is length in m = Clear distance between piers.
(H) is total height of gate in m = FRL - Sill level + 0.15 m
(h) is head of water above sill of gate in m = FRL - Sill level
- (F) **Weight of 1 set of vertical lift crest gate** including embedded parts in tones
 $= 0.0690 (L^2 \times H \times h)^{0.716}$
(L) is length = Clear distance between piers in m+1 m.
(H) is total height of gate in m = FRL - Sill level + 0.20 m
(h) is head of water above sill of gate in m = FRL - Sill level
- (G) **Weight of 1 set Stoplog elements** including embedded parts in tones =
 $0.0578(L^2 \times H \times h)^{0.716}$
(L) is length = Clear distance between piers + 0.65 m
(H) is total height of stoplog gate in m = FRL - Sill level + 0.20 m
(h) is head of water above sill of gate in m = FRL - Sill level
- (H) **Weight of lifting beam** in tones $= 0.02212 \times (L^2 \times H \times h)^{0.716}/n$
(L) is length = Clear distance between piers + 0.65 m.
(H) is total height of stoplog get in m = FRL - Sill level + 0.20 m
(h) is head of water above sill of gate in m = FRL - Sill level
(n) is number of gate elements in 1 set
- (I) **Capacity of screw hoist** in tone including 25% reserve capacity $= 2.50 \times \text{Wt. of gate}$
(Hoist capacity shall be rounded off to next 1 tonne)
Weight of screw hoist with all accessories : 300 kg per tonne capacity of hoist.
- (J) **Hoist Capacity** in tonne including 25% reserve capacity $= 2.5 \times \text{Weight of gate}$ (Hoist capacity shall be rounded off to next 5 tonne)
Weight of hoist with all accessories : 250 kg per tonne capacity of hoist.
- (K) **Weight of hoist bridge :**
Columns with bracings / Anchors / Stiffeners : 400 kg per meter height.
Beams with cross beams / stiffeners : 400 kg per metre span.
Railing / Chequered plate / Ladder etc. : 10% of wt. of columns/beams
- (L) **Weight of trunnion bridge** : 300 kg per meter length of catwalk.
- (M) **Approximate weight of item no. 2602 (d)** i.e Vertical Axis swing gate is 0.50 MT per sqm.
7. Item no. 2602 (a) and 2607(B) is protected under Indian patent act 1970 vide no. 183493 and 189015 respectively and tenderer should ask to produce license for

manufacture and erection and consent letter for technical services from the patent holder/assignee on his own cost.

8. The following Indian Standard, may be referred to

I.S.No.	Title
210-1993	Specifications for grey iron casting (Reaffirmed in 1999).
226-1975	Specifications for structural steel (standard quality) (Superseded by I.S. 2062-1992)
306-1983	Specifications for bronze in gates & castings (Reaffirmed in 1998).
318-1981	Specifications for loaded Tin Bronze and casting (Reaffirmed in 2001) :
800-1984	Code of practice for General construction in steel in general building constructions. (Reaffirmed in 1998)
800-1973(Pt III, V & VI)	Specifications for rolled steel beam, channel and angle sections (Reaffirmed in 1989)
816-1969	Code of practice for use of Metal Arc Welding for general construction in Mild steel. (Reaffirmed in 1998)
817-1987	Code of practice for Staining and testing of metal arc welders. (Reaffirmed in 2003)
819-1957	Code of practice for resistance spot welding for light assemblies in Mild steel. (Reaffirmed in 1998)
822-1970	Code of practice for inspections of welds. (Reaffirmed in 2003)
823-1964	Code of practice for Metal Arc Welding of Mild steel.
1024-1999	Code of practice for use of welding in Bridges and structures, subject to dynamic loading.
1030-1998	Carbon steel castings for general engineering purposes.
1066-1993	Electroplated castings of Nickel & Chromium Iron & Steels. (Reaffirmed 2006)
1181-1967	Qualifying test for Metal Arc Welders. (Superseded by 7318-1974)
1323-1959	Code of practice for Oxygen-Acetylene welding for structural work in mild steel. (Reaffirmed in 2003)
1393-1961	Code of practice for training and testing of Oxygen-Acetylene welding (Reaffirmed in 2003)
1570-1961(Part-VII)	Schedule for wrought steel for general engineering purposes (Reaffirmed in 1998)
2004-1991	Specifications for steel forgings for general engineering purposes.
2062-1999	Specifications for structural steel. (Fusion Welding quality) (Revised in 2006)
2595-1978	Code of practice for Radiographic Testing. (Reaffirmed in 2000)
2825-1969	Code of practice for stress relieving of welding joints. (Reaffirmed in 2002)

I.S.No.	Title
3042-1965	Specifications for single faced sluice gates (200 mm to 1200 mm size) (Reaffirmed in 2003)
4622-2003	Recommendation for structural design of fixed wheel gates.
4623-2000	Recommendations for structural design of radial gates. (III rd revision)
5905-1989	Specifications for sprayed aluminum and zinc coating on iron & steel. (Revised in 2000)
6527-1995	Specifications for stainless steel wire rod (Reaffirmed 2006).
6603-2001	Specifications for Stainless steel bars and flats
6938-2005	Code of practice for design and rope drum and chain hoists for hydraulic gates (with amendment 2)
7718(Pt I)-1991	Recommendations for inspection, testing and maintenance of fixed wheel slide gates at manufacturing stage. (Revised in 1991) (Reaffirmed 2001).
7718(Pt III)- 1978	-do- at the time of erection.. (Revised in 1991)
7718(Pt III)- 1978	-do- after erection. (Revised in 1991)
8500-1991	Structural steel micro alloyed (medium and high strength qualities). (Reaffirmed in 2000)
9349-2006	Recommendations for structural design of medium and high Head Slide gates. (II nd revision)
10096 (Pt.I,Sec.I)- 1963	Recommendations for inspection, testing, maintenance of radial gates and their hoists at manufacturing stage. (revised in 1983 and Reaffirmed in 1990)
10096 (part- 1) 1983	Inspection, testing and assembly at the manufacturing stage section-1 gates. (Reaffirmed in 2000) section-2 rope drum hoists- Rs. 2000
10096 (part- 2) 1983	Inspection, testing and assembly at the time of erection. (Reaffirmed 2000).
10096(Pt.III)- 1983	-do- after erection. British Steel Corporation Corrosion prevention booklet No.5.
10210-1982	Specifications for hydraulic Hoist.

Item No.	Item	Unit	Rate	Remarks
2601	(a) Design, drawing fabrication, supply and erection of structural steel vertical lift gates for canals and Dam sluice etc. above 5.00 meters head fix wheel type with gate leaf (complete with skin plate stiffeners, ballast weight if required, guide embedded parts) first stage anchors sill beam fitted with stainless steel flat, rollers, track fitted with stainless steel flat guide tee, rubber seal etc. as per IS:4622 duly painted as per SOR item no. 1854 with screw hoist hoisting rod, hoist guide, support structure etc.	tonne	155506.00	
	(b) Design, drawing, fabrication, supply and erection of structural steel vertical lift gates for canals and dam sluice etc. above 5.00 meters head fix wheel type with gate leaf (complete with skin plate stiffeners, ballast weight if required guide embedded parts) first stage anchors, sill beam fitted with stainless steel flat, rollers, track fitted with stainless steel flat guide tee, rubber seal etc. as per IS: 4622 duly painted as per SOR item no. 1854 to be operated by Rope drum hoist (excluding weight and cost of rope drum hoist).	tonne	155506.00	
I CREST GATES FOR DAMS / BARRAGE / ANICUT				
2602	(a) Design/Drawing, fabrication, supply and erection of structural steel Automatic Outflow Regulating Gate as per standard specification with gate leaf with end girders, cast steel track plates, rubber seals with SS clamping nut bolts etc., concrete counter weight in bottom compartments of gate leaf, embedded parts consisting of trunion girders, anchor frames, U/s & D/s stoppers, still beams, SS axles, SS seals etc., fulcrum assemblies with links, SS axles, bronze bushes, sail hard curved track plate etc, lever system consisting of actuating lever, lever link, gate bracket, hoisting bracket, SS axles, bronze bushes etc. complete with hoist bridge and portal frame if required (excluding cost & weight of hoist)	tonne	155506.00	
	(b) Design/Drawing, fabrication, supply and erection of structural steel Radial crest gate, as per IS: 4623 with skin plate	tonne	155506.00	

Item No.	Item	Unit	Rate	Remarks
	stiffeners, guide, embedded parts, sill beam, fitted with stainless steel flat, guide roller, rubber seals wall plate fitted with stainless steel flats trunion & anchorage as required complete with hoist bridge etc. (Excluding cost & weight of hoist)			
	(c) Design / Drawing, fabrication, supply and erection of structural steel vertical lift crest gate, as per IS:4622 with skin plate stiffeners, ballast weight guides, embedded parts, sill beam, fitted with stainless steel flat, track beam and sealing frame fitted with stainless steel flat, roller, rubber seals, etc. complete with hoist bridge (Excluding cost & weight of hoist)	tonne	155506.00	
	(d) Design / Drawing, fabrication, supply and erection of automatic openable vertical Axis swing gate with water tight rubber seals, skin plate stiffeners, sill beam, hinge brackets rotating gate leafs of size up to 8 sqm. with structural steel frame, bushing of aluminum bronze, trunnion hubs, friction dampers with stainless steel guide etc. complete including hydraulic jack for closure of gate.	Tonne	155506.00	
2603	Fabrication, supply and erection of structural steel vertical lift gates for canal size 2400 x 2000 mm and above fixed wheel type with gate leaf (complete with skin plate, stiffeners, guide etc., embedded parts) first stage anchors sill beam fitted with S.S. Plate, seal frame fitted with S.S. plate, guide etc. rubber seals as per IS 4622 duly painted as per SOR item 1854 to be operated with rope drum hoist (excluding weight & cost of rope drum hoist)	Tonne	149434.00	
2604	Fabrication, supply and erection of structural steel vertical lift gates for canal below size 2400 x 2000 mm fixed wheel type with gate leaf (complete with skin plate, stiffeners, guide etc. embedded parts first stage anchors sill beam fitted with S.S. plate, seal frame fitted with S.S. plate, guide tee etc.) rubber seals as per IS: 4622 duly painted as per SOR item 1854 to be operated with rope drum hoist (excluding weight & cost of rope drum hoist)	Tonne	149434.00	

Item No.	Item	Unit	Rate	Remarks
2605	Fabrication, supply and erection of fixed wheel/sliding type structural steel vertical lift gates for canal below size 2400 x 2000 mm with gate leaf (complete with skin plate, stiffeners, guide etc.) embedded parts (first stage anchors sill beam fitted with S.S. plate, seal frame fitted with S.S. plate, guide tee etc). rubber seals as per IS: 4622 duly painted as per SOR item 1854 with screw hoist, hoisting rod, guide, hoist support structure etc.	Tonne	149434.00	
II DAM/CANAL GATES OF LARGE SIZE (SHORTER SIDE – 1200 MM & ABOVE)				
2606	(a)Fabrication & supply of water tight structural steel sliding type low head gate for dam head sluice and canals with gate leaf and frame as per IS: 5620 complete with brass/stainless steel lining of appropriate size for seals seats and sill and seals of rubber/ metal, guides, hoisting rod, screw hoist and duly painted as per SOR item No. 1854.	Tonne	112535.00	
III DAM/CANAL GATES OF SHORTER SIZE (LARGER SIDE BELOW – 1200 MM)				
	(b)Fabrication & supply of water tight structural steel sliding type low head sluice with gate leaf and frame as per IS: 5620 complete with brass/ stainless steel lining of appropriate size for seal seats and sill and seals of rubber/ metal guides, hoisting rod, screw hoist and duly painted as per SOR item No. 1854.	Tonne	112535.00	
	(c)Erection of canal gates for item 2606 (a) & 2606 (b)	Tonne	15% of Item No. 2606(A) & (B)	
2607(a)	Supply of Rope Drum Hoist as per IS: 6938-2005 including transportation to site.			
i.	Manually operated hoists 5 M.T. capacity	Per Unit	225170.00	
ii.	Manually operated hoists 8 M.T. capacity	Per Unit	254632.00	
iii.	Manually operated hoists 10 M.T. capacity	Per Unit	336048.00	
iv.	Manually operated hoists 12 M.T. capacity	Per Unit	438955.00	
v.	Manually operated hoists 15 M.T. capacity	Per Unit	526983.00	

Item No.	Item	Unit	Rate	Remarks
vi.	Manually operated hoists 18 M.T. capacity	Per Unit	626175.00	
vii.	Manually operated hoists 20 M.T. capacity	Per Unit	725556.00	
viii.	Manually operated hoists 25 M.T. capacity	Per Unit	828575.00	
ix.	Manually operated hoists 30 M.T. capacity	Per Unit	1043273.00	
x.	Manually operated hoists 35 M.T. capacity	Per Unit	1139505.00	
xi.	Manually operated hoists 40 M.T. capacity	Per Unit	1328250.00	
xii.	Electrically operated Hoists (With Inbuilt Manual operation) 5 M.T. capacity	Per Unit	271975.00	
xiii.	Electrically operated Hoists (With Inbuilt Manual operation) 6 M.T. capacity	Per Unit	303600.00	
xiv.	Electrically operated Hoists (With Inbuilt Manual operation) 8 M.T. capacity	Per Unit	369380.00	
xv.	Electrically operated Hoists (With Inbuilt Manual operation) 10 M.T. capacity	Per Unit	454135.00	
xvi.	Electrically operated Hoists (With Inbuilt Manual operation) 12 M.T. capacity	Per Unit	569250.00	
xvii.	Electrically operated Hoists (With Inbuilt Manual operation) 15 M.T. capacity	Per Unit	717919.00	
xviii.	Electrically operated Hoists (With Inbuilt Manual operation) 18 M.T. capacity	Per Unit	790625.00	
xix.	Electrically operated Hoists (With Inbuilt Manual operation) 20 M.T. capacity	Per Unit	885500.00	
xx.	Electrically operated Hoists (With Inbuilt Manual operation) 25 M.T. capacity	Per Unit	1044258.00	
xxi.	Electrically operated Hoists (With Inbuilt Manual operation) 30 M.T. capacity	Per Unit	1221358.00	
xxii.	Electrically operated Hoists (With Inbuilt Manual operation) 35 M.T. capacity	Per Unit	1309908.00	
2607 (b)	Supply of Emergency Hydraulic Hoist with Rotary damping system for controlling oscillation for automatic outflow regulating gate as per relevant I.S. specification.			
i.	Manually operated hoists 5 M.T. capacity	Per Unit	225170.00	

Item No.	Item	Unit	Rate	Remarks
ii.	Manually operated hoists 8 M.T. capacity	Per Unit	254632.00	
iii.	Manually operated hoists 10 M.T. capacity	Per Unit	336048.00	
iv.	Manually operated hoists 12 M.T. capacity	Per Unit	438955.00	
v.	Manually operated hoists 15 M.T. capacity	Per Unit	526983.00	
vi.	Manually operated hoists 18 M.T. capacity	Per Unit	626175.00	
vii.	Manually operated hoists 20 M.T. capacity	Per Unit	725556.00	
viii.	Manually operated hoists 25 M.T. capacity	Per Unit	828575.00	
ix.	Manually operated hoists 30 M.T. capacity	Per Unit	1043273.00	
x.	Manually operated hoists 35 M.T. capacity	Per Unit	1139505.00	
xi.	Manually operated hoists 40 M.T. capacity	Per Unit	1328250.00	
xii.	Manually operated hoists 45 M.T. capacity	Per Unit	1461075.00	
xiii.	Manually operated hoists 50 M.T. capacity	Per Unit	1593900.00	
xiv.	Manually operated hoists 55 M.T. capacity	Per Unit	1726725.00	
xv.	Manually operated hoists 60 M.T. capacity	Per Unit	1859550.00	
xvi.	Manually operated hoists 65 M.T. capacity	Per Unit	1992375.00	
xvii.	Manually operated hoists 70 M.T. capacity	Per Unit	2125200.00	
xviii.	Manually operated hoists 75 M.T. capacity	Per Unit	2258025.00	
xix.	Manually operated hoists 80 M.T. capacity	Per Unit	2390850.00	
2607 (c)	Erection of hoist, with test, with test & trial	Per Unit	15% of item No. 2607 (a) & (b)	

Item No.	Item	Unit	Rate	Remarks
Special item				
2608	II stage concreting 1:2:4 with graded metal of max. size 12.5 mm in gate groove & sill beam after fixing and alignment of second stage parts, sill beam, including cost of material, labour for shuttering, mixing, laying scaffolding consolidating, curing and cleaning & finishing / chipping as required including all lead & lift.	cum	8280.00	

CHAPTER 27 - MISCELLANEOUS

Notes :-

1. Rates include lead up to 100m and all lifts, for all materials for all items unless otherwise specified.
2. The tenders for item 2735 shall be invited giving exact location of each stilling well.
3. Measurements: - (a) The measurements of lettering shall be taken in terms of letter cm (the cm measurement relates to the vertical height of the lettering). The letter height shall be measured correct to a cm. Dots, dashes, punctuations and other similar marks shall not be measured for payment.

(b) The measurements for item 2735 shall be taken as per the mode of measurement specified under Chapter 13-“Steel and Iron Work”
4. PVC PIPE LINE
 - a. The materials used shall conform to the relevant I.S.
 - b. The rates of pipe line, include laying of pipe line below ground with PVC socket joints, together with all PVC fitting (such as bends, elbows, Tees, Reducers extra couples, K. B. valve Gate valves, Drain valves etc.) and fixing complete with solvent cement including cutting & jointing wherever required.
 - c. The rates for laying and fixing include all labour and materials, tools and plants other than the PVC pipes and fittings.
 - d. Measurements: - (i) All works shall be measured net as fixed to the nearest 0.01m unless otherwise stated.

(ii) The pipeline shall be measured net as fixed, including the length of all fittings (measured along the centre line) and no allowance shall be made for wastage etc.
5. The running payment under the item of patrolling of canals shall be made up to 3 watering and the remaining payment shall be made after the irrigation is completely over as final payment.-
6. The following Indian standards may be referred to:-

I.S.No.	Title
341-1973	Black Japan, Type A, B and C (first revision) (reaffirmed 2002)
788-1971	Ink, drawing, waterproof, coloured (first revision) (reaffirmed 1997)
789-1971	Ink, drawing, water proof, black (first revision) (reaffirmed 1997)
1234-1980	Ink Stencil, Oil base, for marking porous surfaces. (reaffirmed 2003)
2037-1986	Tracing cloth (first revision) (reaffirmed 2006)
3502-1994	Steel chequered plates. (second revision) (reaffirmed 1998)

3678-1976	Ready mixed paint, thick white, for lettering (with amendment No.1) (reaffirmed 1999)
4080-1994	Vertical Staff gauges. (first revision) (reaffirmed 2000)
9033-1978	Reproduction Tracing paper. (reaffirmed 2005)
4985-2000	Specification for unplasticized PVC pipes for Potable water supply (third revision) (reaffirmed 2005)
12231-1987	Specification for PVC (rigid) pipes for use in suction and delivery lines of agriculture pumps. (reaffirmed 2003)
12235-(Part I to XIX)	Thermo plastic pipes and fittings – method of test
2-1960	Rules for rounding of numerical values (revised)
10151-1982	Specification for Poly Vinyl Chloride (PVC) and its copolymers for its safe use in contact with food stuffs pharmaceuticals and drinking water. (reaffirmed 2003)
7834-1975	Part III, IV, VI --- PVC Pipe fittings (reaffirmed 1998)

Item No.	Item	Unit	Rate	Remarks
2701	Second class table moulded brick drip course 100mm x 100mm laid in 1:4 cement mortar including 15mm thick cement plaster 1:3	m	74.00	
2702	Labour only for item 2701	m	40.00	
2703	225mmx110mm stone drip course in cement mortar 1:4 including cement pointing in C.M. 1:3-			
	(a) Plain ashlar masonry	m	215.00	
	(b) Squared rubble coursed masonry (first sort)	m	153.00	
2704	Labour only for -			
	(a) Item 2703 (a)	m	187.00	
	(b) Item 2703 (b)	m	81.00	
2705	Second class table moulded brick cornice, laid in C.M. 1:4 including 15mm thick cement plaster 1:3 throating, weathering and rendering on top, in cement mortar 1:3 with projection of			
	(a) 150 mm	m	152.00	
	(b) 200 mm	m	230.00	
	(c) 300 mm	m	425.00	
	(d) 400 mm	m	675.00	

Item No.	Item	Unit	Rate	Remarks
2706	Labour only for			
	(a) Item 2705 (a)	m	75.00	
	(b) Item 2705 (b)	m	109.00	
	(c) Item 2705 (c)	m	192.00	
	(d) Item 2705 (d)	m	294.00	
2707	Corbel stone 550x150x230mm including laying and fixing in position in C.M. 1:4			
	(a) Plain ashlar masonry	each	141.00	
	(b) Squared rubble coursed masonry (first sort)	each	67.00	
2708	Labour only including dressing for-			
	(a) Item 2707 (a)	each	121.00	
	(b) Item 2707 (b)	each	40.00	
2709	Corbel stone 700x230x230 mm including laying and fixing in position in C.M. 1:4			
	(a) Plain ashlar masonry	each	275.00	
	(b) Squared rubble course, masonry (first sort)	Each	130.00	
2710	Labour only including dressing for			
	(a) Item 2709 (a)	each	236.00	
	(b) Squared rubble coursed masonry (first sort)	each	78.00	
2711	40mm thick Damp proof course of 1:2:4 (with 20mm gauge graded metal) covered with bitumen and sand (1 kg bitumen per Sq. m)	sqm	193.00	
2712	Labour only for Item 2711	sqm	42.00	
2713	1:2:4 R.C.C. Jali, with aggregate of maximum size 6mm, of specified pattern or shape including cost of reinforcement (1.6mm thick MS wire) fixing in position etc., complete-			
	(a) 50 mm thick	sqm	367.00	
	(b) 30 mm thick	sqm	276.00	
	(c) 25 mm thick	sqm	254.00	
2714	(a) Tracing shajras including cost of ink, holders etc, to complete the work excluding cost of cloth.	each	0.40	

Item No.	Item	Unit	Rate	Remarks
	(b) Completion charges for above, writing heading, showing CCA of canal, tube well command, outlets, gulls, service roads, water sheds etc. including cost of ink and holders etc.	each	20% of item no.2714 (a)	
2715	Gober leeping	sqm	1.60	
2716	25mm x 18 BWG hoop iron trellis work (double) clear space 50 mm x 50 mm including 40 mm x 50 mm teak wood frame (100 cm centre to centre, both ways)	sqm	546.00	
2717	Labour only for item 2716	sqm	47.00	
2718	Half split, bamboo fending fixed in form of trellis, with clear space 150mm x 150mm excluding Balli Post.	sqm	122.00	
2719	Labour only for item 2718	sqm	27.00	
2720	Providing and fixing 1.2m high railing of 40 mm dia G.I. pipe in three rows at 40cm C to C with vertical angle 65x65x6 mm, embedded in masonry or in concrete placed at 3m C to C on top of weirs, dams etc. including providing M.S. plate of size 200x200x3mm welded to the bottom of railing posts for anchorage.	m	978.00	
2721	Labour only for item 2720	m	76.00	
2722	75mm thick dubwalling with split bamboos excluding wooden frame.	sqm	196.00	
2723	Labour only for item 2722	sqm	30.00	
2724	Labour only for filling empty cement bags with sand including stitching with sutli and stacking.	each	7.00	
2725	Providing and filling in position bitumen mix filler of proportion 80kg. of hot bitumen 1kg of cement and 0.25 cum of course sand for 12mm thick expansion joints	sqm	105.00	
2726	Marking cement bags with identification mark of the department/project with post office red unwashable colour marking having maximum 10 letters of minimum 6cms height including handling and restacking of cement bags in the store for marking.	each	1.50	
2727	Engraving letters and figures on stones (per letter of figure)	per letter per cm height	1.40	

Item No.	Item	Unit	Rate	Remarks
2728	Lettering or figuring with enamel paints.	per letter per cm height	0.90	
2729	Labour only for item 2728	per letter per cm height	0.60	
2730	Painting gauges 75mm to 150 mm all-round with enamel paint including figuring and lettering complete.	m	119.00	
2731	Labour only for item 2730	m	99.00	
2732	Constructing masonry dust bins, with 60cm wide platform towards opening of II class T.M. brick work in C.M. 1:4 with top of wall sloped inside over 45 cm wide and 15cm thick C.C. 1:4:8 in foundation with 40mm graded metal , 40mm thick 1:2:4 C.C. flooring with 20mm graded metal with a floating coat of neat cement over 7.5cm thick cement concrete 1:4:8 with 40mm graded metal including 12mm cement plaster 1:4 finished with a floating coat of neat cement over exposed surface of masonry walls and 10cm depth below ground level including all excavation refilling and disposal of surplus earth etc. complete-			
	(a) size 180x120 cm	each	6815.00	
	(b) size 120x120 cm	each	5402.00	
2733	Making platform for stand post with 40mm thick cement concrete 1:2:4 with 20mm metal over a base of 10cm thick cement concrete 1:4:8 with 40mm metal with 10x20 cm Kerbs of II class T.M. bricks in cement mortar 1:4 including a floating coat of neat cement over concrete floor and Kerbs including excavation and disposal of surplus earth-			
	(a) 120x120 cm size	each	984.00	
	(b) 90x90 cm size	each	712.00	
2734	Constructing platform consisting of 40mm cement concrete floor 1:2:4 with 20mm graded metal finished with a floating coat of neat cement over a bed of 7.5cm thick cement concrete 1:4:8 with 40mm graded			

Item No.	Item	Unit	Rate	Remarks
	metal including earthwork with 20x30cm II class T.M. Brick curtain walls in C.M. 1:4 over 35cm wide and 12cm thick cement concrete 1:4:8 with 40 mm graded metal 10cm thick and 20cm high brick edging in C.M. 1:4 with drain hole including 12mm cement plaster 1:4 finished with floating coat of neat cement over exposed surface of masonry walls and up to 10cm depth below ground level complete-			
	(a) 120x120 cm (outside to outside)	each	1859.00	
	(b) 210x120 cm (outside to outside)	each	2730.00	
	(c) 320x120 cm (outside to outside)	each	3796.00	
2735	Providing, fabrication and erection of stilling well as per drawing, on the sides of abutment or pier of high level bridges on rivers, for installing automatic gauge recorder 6mm thick chequered plate, main and cross girders of size 150x75mm @ 15kg per m, 6mm thick M.S. sheet for stilling well, 50x50x6 mm angle iron (@4.5kg per m) for railing posts and ladder, 50x6mm flat iron for railing and fastening AGR well with piers, including cutting punching welding, nuts and bolts and flanges of requisite sizes with painting 2 coats of aluminum paint fo superior quality over one coat of zinc-chrome, priming, with all lead and lift, cost of all material hoisting and labour, mobilisation and demobilisation of all necessary equipment etc. complete. (All materials conforming to relevant I.S.S.)	kg	200.00	
P.V.C. PIPE LINE				
2736	Providing laying in trenches and jointing water tight with jointing material rigid PVC (Poly Vinyl Chloride) Class II Pressure pipes (with working Pressure of 4Kg / cm ²) as per IS: 4985-1988 (second Revision) with all leads and lifts complete including cost of one coupler per pipe of six meter length but excluding excavation and refilling of trenches and also excluding other pipe fittings and labour for other pipe fittings.			Item nos.2736 to 2753 can only be executed or material procured after obtaining written permission from the C.E. concern.
	(a) 90 mm dia	m	163.00	
	(b) 110 mm dia	m	234.00	
	(c) 140 mm dia	m	406.00	

Item No.	Item	Unit	Rate	Remarks
	(d) 160 mm dia	m	547.00	
	(e) 180 mm dia	m	719.00	
	(f) 200 mm dia	m	870.00	
2737	Labour only for item No. 2736			
	(a) 90 mm dia	m	2.00	
	(b) 110 mm dia	m	3.00	
	(c) 140 mm dia	m	4.00	
	(d) 160 mm dia	m	5.00	
	(e) 180 mm dia	m	5.00	
	(f) 200 mm dia	m	6.00	
2738	Providing and fixing in position PVC moulded coupler for PVC pipe line with all materials.			
	(a) 90 mm dia	each	109.00	
	(b) 110 mm dia	each	136.00	
	(c) 140 mm dia	each	297.00	
	(d) 160 mm dia	each	358.00	
	(e) 180 mm dia	each	566.00	
	(f) 200 mm dia	each	603.00	
2739	Labour only for item No. 2738			
	(a) 90 mm dia	Nos.	5.00	
	(b) 110 mm dia	Nos.	6.00	
	(c) 140 mm dia	Nos.	7.00	
	(d) 160 mm dia	Nos.	8.00	
	(e) 180 mm dia	Nos.	9.00	
	(f) 200 mm dia	Nos.	10.00	
2740	Providing and fixing in position PVC moulded-Elbow for PVC pipe line with all materials.			
	(a) 90 mm dia	each	195.00	
	(b) 110 mm dia	each	344.00	
	(c) 140 mm dia	each	457.00	
	(d) 160 mm dia	each	600.00	
	(e) 180 mm dia	each	702.00	
	(f) 200 mm dia	each	809.00	

Item No.	Item	Unit	Rate	Remarks
2741	Labour only for Item No.2740			
	(a) 90 mm dia	Nos.	5.00	
	(b) 110 mm dia	Nos.	6.00	
	(c) 140 mm dia	Nos.	6.40	
	(d) 160 mm dia	Nos.	7.10	
	(e) 180 mm dia	Nos.	7.60	
	(f) 200 mm dia	Nos.	8.20	
2742	Providing and fixing in position PVC moulded equal Tee complete with all material for PVC pipeline			
	(a) 90 mm dia	each	261.00	
	(b) 110 mm dia	each	398.00	
	(c) 140 mm dia	each	897.00	
	(d) 160 mm dia	each	1336.00	
	(e) 180 mm dia	each	1479.00	
	(f) 200 mm dia	each	1718.00	
2743	Labour only for Item No.2742			
	(a) 90 mm dia	Nos.	6.00	
	(b) 110 mm dia	Nos.	6.60	
	(c) 140 mm dia	Nos.	7.10	
	(d) 160 mm dia	Nos.	7.60	
	(e) 180 mm dia	Nos.	8.20	
	(f) 200 mm dia	Nos.	9.50	
2744	Providing and fixing in position PVC end cap for PVC pipeline including all materials.			
	(a) 90 mm dia	each	88.00	
	(b) 110 mm dia	each	119.00	
	(c) 140 mm dia	each	255.00	
	(d) 160 mm dia	each	341.00	
	(e) 180 mm dia	each	479.00	
	(f) 200 mm dia	each	628.00	
2745	Labour only for item No. 2744			
	(a) 90 mm dia	Nos.	2.20	
	(b) 110 mm dia	Nos.	2.80	
	(c) 140 mm dia	Nos.	3.30	

Item No.	Item	Unit	Rate	Remarks
	(d) 160 mm dia	Nos.	3.80	
	(e) 180 mm dia	Nos.	4.40	
	(f) 200 mm dia	Nos.	4.90	
2746	Providing and fixing in position PVC Reducer single for PVC pipe line including all materials.			
	(a) 110x90 mm dia	each	180.00	
	(b) 140x110 mm dia	each	240.00	
	(c) 160x140 mm dia	each	408.00	
	(d) 180x160 mm dia	each	600.00	
	(e) 200x180 mm dia	each	705.00	
2747	Labour only for item No. 2746			
	(a) 110x90 mm dia	Nos.	5.50	
	(b) 140x110 mm dia	Nos.	6.00	
	(c) 160x140 mm dia	Nos.	6.60	
	(d) 180x160 mm dia	Nos.	7.10	
	(e) 200x180 mm dia	Nos.	7.60	
2748	Providing and fixing in position K.B valve for PVC pipe line including all accessories and materials complete.			
	(a) 90 mm dia	each	1388.00	
	(b) 110 mm dia	each	1584.00	
	(c) 140 mm dia	each	1786.00	
	(d) 160 mm dia	each	1905.00	
	(e) 180 mm dia	each	2072.00	
	(f) 200 mm dia	each	2369.00	
2749	Labour only for Item No. 4748			
	(a) 90 mm dia	Nos.	5.50	
	(b) 110 mm dia	Nos.	6.00	
	(c) 140 mm dia	Nos.	6.60	
	(d) 160 mm dia	Nos.	7.10	
	(e) 180 mm dia	Nos.	7.60	
	(f) 200 mm dia	Nos.	8.20	

Item No.	Item	Unit	Rate	Remarks
2750	Providing and fixing in position 25mm dia Air Release valve of approved quality with PVC service saddle and 1.00m long 25mm dia G.I. pipe with all accessories and materials complete.			
	(a) 90 x 25 mm dia	each	1500.00	
	(b) 110 x 25 mm dia	each	1537.00	
	(c) 140 x 25 mm dia	each	1586.00	
	(d) 160 x 25 mm dia	each	1659.00	
	(e) 180 x 25 mm dia	each	1803.00	
	(f) 200 x 25 mm dia	each	1924.00	
2751	Labour only for Item No. 2750			
	(a) 90 x 25 mm dia	Nos.	135.00	
	(b) 110 x 25 mm dia	Nos.	149.00	
	(c) 140 x 25 mm dia	Nos.	163.00	
	(d) 160 x 25 mm dia	Nos.	176.00	
	(e) 180 x 25 mm dia	Nos.	190.00	
	(f) 200 x 25 mm dia	Nos.	203.00	
2752	Providing and fixing in position Gate valve/ Drain valve of approved quality for PVC pipe line including all accessories and materials complete :-			
	(a) 90 mm dia	each	1599.00	
	(b) 110 mm dia	each	2354.00	
	(c) 140 mm dia	each	3120.00	
	(d) 160 mm dia	each	3884.00	
	(e) 180 mm dia	each	4663.00	
	(f) 200 mm dia	each	5833.00	
2753	Labour only for Item No. 2752			
	(a) 90 mm dia	Nos.	57.00	
	(b) 110 mm dia	Nos.	64.00	
	(c) 140 mm dia	Nos.	70.00	
	(d) 160 mm dia	Nos.	81.00	
	(e) 180 mm dia	Nos.	95.00	
	(f) 200 mm dia	each	114.00	

Item No.	Item	Unit	Rate	Remarks
2754	Labour only for fixing in position single steel shutter for stop dam including all handling cleaning of grooves i.e. removal of foreign materials such as dust, sand, silt etc. including greasing, oiling where ever required, excluding cost of materials.	sq.m.	42.00	Over all dimension of shutters to be considered.
2755	Labour only for removing single steel shutter for stop dam including all handling, unscrewing, oiling, where ever necessary excluding cost of all materials & staking at site.	sq.m.	42.00	---do---
2756	Labour only for fixing in position the steel/wooden karri shutters for stop dam excluding filling the puddle earth but including all handling, cleaning of grooves i.e. removal of foreign materials such as dust, sand, silt etc. including greasing, oiling where ever required excluding cost of materials.	sq.m.	42.00	Over all dimension of Karri shutters to be considered.
2757	Labour only for removing the steel/wooden karri shutters for stop dam without removal of puddle earth but including handling, unscrewing, oiling, where ever necessary excluding cost of all materials & staking at site.	sq.m.	42.00	---do---
2758	Patrolling of canal during irrigation of any crop including ordinary jungle clearance, removing obstacles & foreign materials from canal section, including opening & closing of colaba gates / opening on demand for water by cultivators and including such minor repair works which are essential for proper running or water in canal as directed by Engineer in charge.	Per Water- ing/ Ha.	20.00	
2759	Providing and laying 100 mm thick shotcrete lining as per mix design to rock face in two layers of 50 mm each with 12 mm down graded metal including additives, cleaning by air and water under required pressure, scaffolding, batching mixing, transporting & shifting of equipments, curing finishing.	sqm	1540.00	
2760	Fixing only standard steel or aluminium glazed doors, windows and ventilators in walls with lugs 10x16x3.16 mm embedded in cement concrete block 15x10x10 cm size 1:3:6 (1 cement:3 sand:6 stone	sqm	134.00	

Item No.	Item	Unit	Rate	Remarks
2761	aggregate,20mm nominal size) or with wooden plugs and screws or rawl plugs and screws or with fixing clips or with bolts and nuts as required i/c fixing of glass panes with glazing clips and special metal sash putty of approved make or metal beading with screws(excluding steel windows with lugs, glass panes cut to size and glazing clips or metal beading with screws)	sqm	8.50	
2761	(a) Removal of water hyacinth (jalkumbhi) and similar water born vegetations from reservoir/barrage including cost of all equipments ,materials and depositing at specified places with all leads and lifts	sqm	8.50	
	(b) Destroying of water hyacinth (jalkumbhi) by using chemical or any other means and disposal of residual at the specified places including all charges.	sqm	2.60	

CHAPTER 28 - WELL EXCAVATION

Notes :-

1. Rates include all lifts (after addition of item 2804 or item 2808 as the case may be) and removal of excavated materials to a distance of 50m beyond the well, unless otherwise specified.
2. Rates include all shoring, strutting, planking, etc. that may be needed to prevent collapse of sides of well.
3. Rates of rock cutting are subject to 40% deduction for voids, if paid on stack measurements.
4. Extra rate for wet excavation below sub soil water level will be paid as per item 411 of Chapter 4-"EXCAVATION AND EARTHWORK"
5. Payment shall be made as per external dia of well steining, foundation, irrespective of actual excess dia excavated. No allowance shall be made for slope of steps, if any.
6. Classification of strata shall be as per Note 2 of Chapter 4 "Excavation and Earthwork"
7. For deepening of existing wells, the depth will be considered from platform level.

Item No.	Item	Unit	Rate	Remarks
2801	Excavation in soft or ordinary soil including 50m lead and 1.5m lift with dressing.	cum	64.00	
2802	Excavation in hard soil including 50m lead and 1.5m lift with dressing.	cum	76.00	
2803	Excavation in moorum and moorum with boulder including 50m lead and 1.5m lift with dressing.	cum	89.00	
2804	Add extra in items 2801 to 2803 above for depth			
	(a) Beyond 1.5m to 3m	cum	4.00	
	(b) Beyond 3m to 4.5m	cum	5.00	
	(c) Beyond 4.5m to 6m	cum	7.00	
	(d) Beyond 6m to 7.5m	cum	10.00	
	(e) Beyond 7.5m to 9m	cum	12.00	
	(f) Beyond 9m to 10.5m	cum	14.00	
	(g) Beyond 10.5m to 12m	cum	16.00	
	(h) Beyond 12m to 13.5m	cum	19.00	
	(i) Beyond 13.5m to 15m	cum	21.00	
	(j) Beyond 15m to 16.5m	cum	23.00	
	(k) Beyond 16.5m to 18m	cum	25.00	
	(l) Beyond 18m to 19.5m	cum	28.00	

Item No.	Item	Unit	Rate	Remarks
	(m) Beyond 19.5m to 21m	cum	30.00	
	(n) Beyond 21m to 22.5m	cum	34.00	
	(o) Beyond 22.5m to 24m	cum	37.00	
2805	Excavation in disintegrated rock including 50 m lead and 1.5m lift with dressing.	cum	177.00	
2806	Excavation in soft rock including 50m lead and 1.5m lift with dressing.	cum	315.00	
2807	Excavation in hard rock including 50m lead and 1.5m lift-			
	(a) Blasting permitted	cum	562.00	
	(b) Blasting prohibited (i.e. wedged and chiseled).	cum	770.00	
2808	Add extra in item Nos. 2805 to 2807 above for depth-			
	(a) Beyond 1.5m to 3m	cum	6.00	
	(b) Beyond 3m to 4.5m	cum	7.00	
	(c) Beyond 4.5m to 6m	cum	11.00	
	(d) Beyond 6m to 7.5m	cum	14.00	
	(e) Beyond 7.5m to 9m	cum	17.00	
	(f) Beyond 9m to 10.5m	cum	20.00	
	(g) Beyond 10.5m to 12m	cum	23.00	
	(h) Beyond 12m to 13.5m	cum	26.00	
	(i) Beyond 13.5m to 15m	cum	30.00	
	(j) Beyond 15m to 16.5m	cum	35.00	
	(k) Beyond 16.5m to 18m	cum	40.00	
	(l) Beyond 18m to 19.5m	cum	44.00	
	(m) Beyond 19.5m to 21m	cum	48.00	
	(n) Beyond 21m to 22.5m	cum	53.00	
	(o) Beyond 22.5m to 24m	cum	56.00	
	(p) Beyond 24m to 25.5m	cum	59.00	
	(q) Beyond 25.5 m to 27m	cum	62.00	
	(r) Beyond 27m to 28.5m	cum	65.00	
	(s) Beyond 28.5m to 30m	cum	68.00	

CHAPTER 29 - TRANSPORTATION OF MATERIALS

Notes:-

1. The rates include loading and unloading, but exclude stacking unless specifically mentioned in the item. The stacking charges will be payable as per items 516 and 517 of Chapter-5 "Collection of Materials" and item 2906 of this chapter.
2. For fractions of lead, next higher lead shall be payable.
3. Rate for transportation beyond 200m apply for all modes of transportation by road i.e. car, truck or any other means.
4. For finished Items, payments for materials will be made as per quantities shown in appendix-I.
5. For finished items the payment will be made for delivery of materials at specified sites.
6. Measurements: - (a) The following deductions will be made from stack measurement-

(i) Metal, Kankar, gravel, shingle, stone chips and quarry spalls.	8%
(ii) Moorum, sand, boulders, masonry stones, pitching stones and rubble.	16%
(iii) Puddle earth	25%

 - (b) Metal, moorum and sand for use on road work will be boxed for measurements in boxes measuring 1.5mx1.5mx0.5.
 - (c) Boulders for use on road work will be stacked in regular stacks measuring 2.5mx5m x0.5m.
 - (d) For other works if (b) and (c) cannot be followed the materials may be stacked in stack with length and breadth in multiples of 1m.
7. Rates for carting Hume pipes are inclusive of transportation of collars also. The transportation rate for pipe alone is only 92% of the fully rate and 8% is the rate of transportation of collars.
8. Free lead wherever provided is meant for handling or rehandling materials after final carting and hence total lead for all materials carted, wherever admissible, shall be payable without deduction of free lead. However, where the lead involved is 200m or less, the free lead provided in the item should be deducted.
9. For departmental works, if the material to be carted is less than the cart capacity, the full rates, as for full cart or truck may be paid but this should be done only in urgent and unavoidable cases with the approval of the Executive Engineer, in writing.

Item No.	Item	Unit	Rate	Remarks
2901	Transportation charges of water for every additional 200m or part thereof, beyond initial lead of 100m for-			
	(a) Consolidation of earth work	cum of earth work	1.80	
	(b) Puddle work	cum of earth work	2.70	
	(c) Construction of masonry or concrete	cum of masonry or concrete	9.60	
	(d) Metal consolidation of W.B.M. Road metal	cum of metal	4.20	
2902	Transportation of metal when total distance is-			
	(1) Up to 200m -			
	(a) Up to 25m	cum	23.00	
	(b) Add for every additional 25m	cum	5.50	
	(2) More than 200m but up to 500m-			
	(a) 200m (0.2km)	cum	60.90	
	(b) Add for every additional 50m	cum	6.10	
	(3) More than 0.5km but up to 5km-			
	(a) 0.5 km	cum	97.20	
	(b) Add for every additional 0.5 km	cum	9.10	
	(4) More than 5 km but up to 10 km-			
	(a) 5 km	cum	178.80	
	(b) Add for every additional 0.5 km	cum	5.50	
	(5) More than 10km but up to 30km-			
	(a) 10 km	cum	227.40	
	(b) Add for every additional 1 km	cum	4.40	
	(6) More than 30km but up to 50 km			
	(a) 30 km	cum	313.80	
	(b) Add for every additional 1 km	cum	3.80	
	(7) More than 50km but up to 100 km			
	(a) 50 km	cum	389.50	
	(b) Add for every additional 1 km	cum	3.30	

Item No.	Item	Unit	Rate	Remarks
	(8) 100 km or more -			
	(a) 100 km	cum	551.50	
	(b) Add for every additional 1 km	cum	3.00	
2903	Transportation rates for different construction materials :-			

S.No.	Name of materials	Unit	Rates as percentage of metal transportation rate per cum vide item 2902
1.	Masonry stone	cum	140% of metal transportation rate
2.	Bricks, kankar, stone, chips shingle & excavated materials in disintegrated rock & soft rock		Same as per metal transportation
3.	Boulder, laterite, rubble, pitching stones, and excavated hard rock.	cum	115% of metal transportation rate
4.	Moorum, sand, earth, surkhi, cement and mortars	cum	90% metal transportation rate
5.	Lime (Fat), Hydraulic or any other	cum	70% of metal transportation rate
6.	(a) Flag stone 20 to 40 mm thick	sqm	4% of metal transportation rate
	(b) Flag stone 40 to 50mm thick	sqm	6% of metal transportation rate
7.	Stone slabs or stone lintels of thickness above 50mm	cum	140% of metal transportation rate
8.	Coal, fuel, wood, ironwork, steel, G.I.sheets, paints, oils, pipes and machinery etc.	tonne	90% of metal transportation rate
9.	120 to 150mm dia ballies	m	1.5% of metal transportation rate
10.	100 to 119mm dia ballies	m	0.8% of metal transportation rate
11.	75 to 99mm dia ballies	m	0.3% of metal transportation rate
12.	Sawn timber	cum	67% of metal transportation rate
13.	Mangalore, Burn & Co. cement, sand, pattern tiles. including ridges and hips mosaic and terrazo tiles	sqm	4% of metal transportation rate
14.	Single Allahabad or country wheel tiles including ridges and hips.	sqm	6% of metal transportation rate
15.	Double Allahabd or double wheel tiles including ridges and hips.	sqm	12% of metal transportation rate
16.	Tar, Maxphalt, Asphalt and Bitumen, etc.	tonne	104.5% of metal transportation rate
17.	(a) A.C. big six or trafford roofing sheets	Well	1.2%of metal transportation rate
	(b) A.C. ridges and hips for item 17(a)	m	0.8% of metal transportation rate

S.No.	Name of materials	Unit	Rates as percentage of metal transportation rate per cum vide item 2902
18.	Bamboos	100m	4% of metal transportation rate
19.	Hume pipes (NP2)-		
	(a) 80 to 150mm dia	m	3% of metal transportation rate
	(b) 250 to 300 mm dia	m	7% of metal transportation rate
	(c) 350 to 450 mm dia	m	14% of metal transportation rate
	(d) 500 to 600mm dia	m	19% of metal transportation rate
	(e) 700 to 750 mm dia	m	33% of metal transportation rate
	(f) 800 to 900 mm dia	m	46% of metal transportation rate
	(g) 1000 to 1200 mm dia	m	93% of metal transportation rate
	(h) above 1200 mm dia	m	140% of metal transportation rate
20.	Hume pipes (NP3)-		
	(a) 350 to 450mm dia	m	20% of metal transportation rate
	(b) 500 to 600 mm dia	m	30% of metal transportation rate
	(c) 700 to 750 mm dia	m	50% of metal transportation rate
	(d) 800 to 900mm dia	m	70% of metal transportation rate
	(e) 1000 to 1200 mm dia	m	140% of metal transportation rate

2904 Transportation rates for different construction materials under item 2903 for leads from 0.5 to 5 K.M.

S.No.	Name of material	Unit	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Metal	cum	97.20	106.30	115.40	124.50	133.60	142.70	151.80	160.90	170.00	179.10
2	Masonry stone	cum	136.08	148.82	161.56	174.30	187.04	199.78	212.52	225.26	238.00	250.74
3	Bricks, Kankar, stone chips, shingle and excavated material in disintegrated rock or soft rock	cum	97.20	106.30	115.40	124.50	133.60	142.70	151.80	160.90	170.00	179.10
4	Boulder, laterite, rubble, pitching stone and excavated hard rock	cum	111.78	122.25	132.71	143.18	153.64	164.11	174.57	185.04	195.50	205.97
5	Moorum, sand, earth, surkhi, cement, and mortars	cum	87.48	95.67	103.86	112.05	120.24	128.43	136.62	144.81	153.00	161.19
6	Lime (Fat), Hydraulic or dry mortar	cum	68.04	74.41	80.78	87.15	93.52	99.89	106.26	112.63	119.00	125.37
7(a)	Flag stone 20 to 40 mm thick -	sqm	3.89	4.25	4.62	4.98	5.34	5.71	6.07	6.44	6.80	7.16
7(b)	Flag stone, 40 to 50 mm thick -	sqm	5.83	6.38	6.92	7.47	8.02	8.56	9.11	9.65	10.20	10.75
8	Stone slab or stone lintels of thickness above 50mm	cum	136.08	148.82	161.56	174.30	187.04	199.78	212.52	225.26	238.00	250.74
9	Coal, fuel, wood, iron work, steel, G.I. sheets, paints, oils, pipes & machinery etc.	tonne	87.48	95.67	103.86	112.05	120.24	128.43	136.62	144.81	153.00	161.19
10	120 to 150 mm dia ballies	m	1.46	1.59	1.73	1.87	2.00	2.14	2.28	2.41	2.55	2.69
11	100 to 119 mm dia ballies.	m	0.78	0.85	0.92	1.00	1.07	1.14	1.21	1.29	1.36	1.43
12	75 to 99 mm dia ballies	m	0.29	0.32	0.35	0.37	0.40	0.43	0.46	0.48	0.51	0.54
13	Sawn timber	cum	65.12	71.22	77.32	83.42	89.51	95.61	101.71	107.80	113.90	120.00
14	Mangalore, Burn & Co., cement sand pattern tiles including ridges, hips, mosaic, and terrazzo tiles.	sqm	3.89	4.25	4.62	4.98	5.34	5.71	6.07	6.44	6.80	7.16
15	Single Allahabad or country wheel tiles including ridges and hips.	sqm	5.83	6.38	6.92	7.47	8.02	8.56	9.11	9.65	10.20	10.75

S.No	Name of material	Unit	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
1	2	3	4	5	6	7	8	9	10	11	12	13
16	Double Allahabad or double wheel tiles including ridges and hips	sqm	11.66	12.76	13.85	14.94	16.03	17.12	18.22	19.31	20.40	21.49
17	Tar, Maxphalt, Asphalt and Bitumen etc.	tonne	101.57	111.08	120.59	130.10	139.61	149.12	158.63	168.14	177.65	187.16
18(a)	A.C. bigsix or Trafford roofing sheets	sqm	1.17	1.28	1.38	1.49	1.60	1.71	1.82	1.93	2.04	2.15
18(b)	A.C. ridges and hips for item 18(a)	m	0.78	0.85	0.92	1.00	1.07	1.14	1.21	1.29	1.36	1.43
19	Bamboos	100 m	3.89	4.25	4.62	4.98	5.34	5.71	6.07	6.44	6.80	7.16
20	Hume pipes (NP2)											
	(a) 80 to 150 mm dia	m	2.92	3.19	3.46	3.74	4.01	4.28	4.55	4.83	5.10	5.37
	(b) 250 to 300 mm dia	m	6.80	7.44	8.08	8.72	9.35	9.99	10.63	11.26	11.90	12.54
	(c) 350 to 450 mm dia	m	13.61	14.88	16.16	17.43	18.70	19.98	21.25	22.53	23.80	25.07
	(d) 500 to 600 mm dia	m	18.47	20.20	21.93	23.66	25.38	27.11	28.84	30.57	32.30	34.03
	(e) 700 to 750 mm dia	m	32.08	35.08	38.08	41.09	44.09	47.09	50.09	53.10	56.10	59.10
	(f) 800 to 900 mm dia	m	44.71	48.90	53.08	57.27	61.46	65.64	69.83	74.01	78.20	82.39
	(g) 1000 to 1200 mm dia	m	90.40	98.86	107.32	115.79	124.25	132.71	141.17	149.64	158.10	166.56
	(h) above 1200 mm dia	m	136.08	148.82	161.56	174.30	187.04	199.78	212.52	225.26	238.00	250.74
21	Hume pipes (NP3)-											
	(a) 350 to 450 mm dia	m	19.44	21.26	23.08	24.90	26.72	28.54	30.36	32.18	34.00	35.82
	(b) 500 to 600 mm dia	m	29.16	31.89	34.62	37.35	40.08	42.81	45.54	48.27	51.00	53.73
	(c) 700 to 750 mm dia	m	48.60	53.15	57.70	62.25	66.80	71.35	75.90	80.45	85.00	89.55
	(d) 800 to 900 mm dia	m	68.04	74.41	80.78	87.15	93.52	99.89	106.26	112.63	119.00	125.37
	(e) 1000 to 1200 mm dia	m	136.08	148.82	161.56	174.30	187.04	199.78	212.52	225.26	238.00	250.74

Based on Rates vide item 2902

Item No.	Item	Unit	Rate	Remarks
2905	Loading and unloading			
	(1) Unloading of cement from wagon & stacking on platform	bag	3.10	
	(2) Loading of cement in to wagon from platform & stacking in wagon	bag	3.10	
	(3) Loading of cement in to truck from platform	bag	2.20	
	(4) unloading of cement from truck dumper etc & stacking in stores	bag	1.90	
	(5) Labour only, for loading of metal in truck,dumper etc	Cum	29.10	
	(6) Labour only, for unloading of metal in truck,dumper etc	Cum	14.10	
	(7) Labour only for loading for material other than metal and steel in truck and dumper,etc	as in 2903	Rs. 9.60	multiplied by the percentage given under item 2903.
	(8) Labour only for unloading for material other than metal and steel in truck and dumper,etc	as in 2903	Rs. 4.80	multiplied by the percentage given under item 2903.
	(9) Unloading of steel from wagon & stacking on railway platform			
	(a) MS bars in coils	tonne	205.90	
	(b) Other than(a) above	tonne	154.50	
	(10) Loading of steel from railway platform or store yard into trucks,dumper,etc.			
	(a) MS bars in coils	tonne	154.50	
	(b) Other than(a) above	tonne	100.40	

Item No.	Item	Unit	Rate	Remarks
	(11) Unloading of steel from truck dumper, etc.	tonne	61.80	
	(12) Bending steel bars of dia 16mm and above and more than 6m length into halves for carriage purpose.	tonne	82.20	
	(13) Stacking steel bars in store yard	tonne	133.90	
	(14) Stacking of cement bags	tonne	0.80	
	(15) Extra rate for loading in truck, dumper, etc. for NP2 pipes (dia above 400mm), NP3 pipes and heavy pieces of other materials (each piece of more than 300kg)	as in 2903	50% of the amount arrived at vide item 2905 (7)	
	(16) Extra rate for unloading from truck dumper, etc. for NP2 pipes (dia above 400mm) NP3 pipes and heavy pieces of other materials (each piece of more than 300kg)	as in 2903	50% of the amount arrived at vide item 2905 (8)	
2906	Stacking of materials vide S.No.(5) to (18) of item No. 2903	as in 2903	15.5* %of 2903	

CHAPET 30 – WATER SUPPLY

Notes-

1. Rates include all lead and lifts for all materials.
2. The materials used shall conform to the relevant I.S.S.
3. The rates for pipeline, include laying of pipeline below ground or fixed to the walls, steel tubing's with steel socket joints, together with all tube fittings (such as bends, elbows, tees, reducers, plugs, unions, sleeve pieces, etc.) and fixing complete with holder-bat-clamps or wall-hooks (when pipe is fixed in chases), wooden plugs, making holes in the walls for crossing the pipe and repairing the same with cement mortar 1:3 to the original condition, excavation of trenches of required depth and width in all types of soils, refilling the trenches, with surface properly dressed and rammed.
4. The rates for laying and fixing include all labour and materials, tools and plants other than tubes and fittings.

Measurements:-

- (i) All work shall be measured net as fixed to the nearest 0.01 m unless otherwise stated.
 - (ii) The pipeline shall be measured net as fixed, including the length of all fittings (measured along the center line) and no allowance shall be made for wastage etc.
5. The following Indian Standards may be referred to: -

I.S. No.	Title
554-1999	Dimensions for pipe threads where pressure joints are required on the threads (fourth revision) (with amendment No. 1).
778-1984	Copper alloy gate, globe and check valves for water supply purposes (fourth revision). (reaffirmed 2005)
781-1984	Cast copper alloy screw-down bib taps and stop valves for water services (third revision) (with amendment No. 1). (reaffirmed 2005)
782-1978	Caulking lead (third revision). (reaffirmed 2003)
1068-1993	Electroplated coating of nickel and chromium on iron and steel (first revision) (with amendment Nos. 1 & 2). (reaffirmed 2006)
1172-1993	Code of basic requirements for water supply, drainage and sanitation (second revision).
1239	Mild steel tubes, tubular and other wrought steel fittings –
1239-(Pt-I) 2004	Part – I – Mild steel tubes (fifth revision) (with amendment No. 1).
1239 (Pt-II) 1992	Part – II – Mild steel tubular and other wrought steel pipe fittings (second revision).
1711-1984	Self – closing taps (first revision) (with amendments 1 & 2) (reaffirmed 2005).
1795-1982	Pillar taps for water supply purposes (first revision) (with amendments 1 & 4). (reaffirmed 2005).
2065-1983	Code of practice for water supply in buildings (IIInd revision).

2629-1985	Recommended practice for hot dip galvanising of iron and steel. (reaffirmed 2001).
2692-1983	Ferrules for water services (IInd revision). (Reaffirmed 2003).
4346-1982	Washers for water taps for cold water services (reaffirmed 2005).
4736-1986	Hot-dip zinc coating on steel tubes. (reaffirmed 2006).
9763-2000	Plastic bib taps and stop valves (rising spindle for cold water services). (reaffirmed 2005).

Item No.	Item	Unit	Rate	Remarks
3001	Providing and fixing galvanised mild steel tubes (Medium Grade) IS:1239 Part – I – 1979, complete with fittings and clamps, including cutting and making good the walls, etc. complete (internal works) -			
	(a) 15 mm dia	m	131.00	
	(b) 20 mm dia	m	166.00	
	(c) 25 mm dia	m	231.00	
	(d) 32 mm dia	m	276.00	
	(e) 40 mm dia	m	312.00	
	(f) 50 mm dia	m	362.00	
3002	Labour only for item No. 3001			
	(a) 15 mm dia	m	22.00	
	(b) 20 mm dia	m	25.00	
	(c) 25 mm dia	m	27.00	
	(d) 32 mm dia	m	31.00	
	(e) 40 mm dia	m	40.00	
	(f) 50 mm dia	m	49.00	
3003	Fixing G.I. pipeline, with all materials except pipe, fittings and clamps but including making good the walls and floors etc. complete (for item 3001) -			G.I. pipe fittings and clamps will be supplied by the department
	(a) 15 mm dia	m	24.00	
	(b) 20 mm dia	m	27.00	
	(c) 25 mm dia	m	30.00	
	(d) 32 mm dia	m	35.00	
	(e) 40 mm dia	m	44.00	
	(f) 50 mm dia	m	54.00	

Item No.	Item	Unit	Rate	Remarks
3004	Providing and fixing galvanised mild steel tubes (Medium Grade), IS :1239 (Part - I) – 1979, complete with fittings, including trenching and re-filling etc. complete (external works) :-			
	(a) 15 mm dia	m	118.00	
	(b) 20 mm dia	m	149.00	
	(c) 25 mm dia	m	212.00	
	(d) 32 mm dia	m	251.00	
	(e) 40 mm dia	m	281.00	
	(f) 50 mm dia	m	320.00	
	(g) 65 mm dia	m	389.00	
	(h) 80 mm dia	m	480.00	
	(i) 100 mm dia	m	609.00	
3005	Labour only for item No. 3004			
	(a) 15 mm to 20 mm dia	m	14.00	
	(b) 25 mm to 32 mm dia	m	18.00	
	(c) 40 mm to 50 mm dia	m	21.00	
	(d) 65 mm to 100 mm dia	m	25.00	
3006	Laying G.I. pipe line with all materials except pipe, fittings and clamps but including excavation of trenches and refilling etc. complete (for item 3004) -			Pipe fittings and clamps will be supplied by the department.
	(a) 15 mm dia	m	15.00	
	(b) 20 mm dia	m	16.00	
	(c) 25 mm dia	m	20.00	
	(d) 32 mm dia	m	20.00	
	(e) 40 mm dia	m	24.00	
	(f) 50 mm dia	m	25.00	
	(g) 65 mm dia	m	29.00	
	(h) 80 mm dia	m	31.00	
	(i) 100 mm dia	m	32.00	
3007	Providing and fixing in position best Indian make copper alloy gate, globe and check valve (class I), I.S: 7780-1980 with iron wheel head etc. complete.			

Item No.	Item	Unit	Rate	Remarks
	(a) 15 mm dia	each	220.00	
	(b) 20 mm dia	each	320.00	
	(c) 25 mm dia	each	396.00	
	(d) 32 mm dia	each	451.00	
	(e) 40 mm dia	each	594.00	
	(f) 50 mm dia	each	974.00	
	(g) 65 mm dia	each	1815.00	
	(h) 80 mm dia	each	2387.00	
	(i) 100 mm dia	each	4238.00	
3008	Labour only for item 3007 -			
	(a) Up to 50 mm dia	each	55.00	
	(b) Above 50 mm dia	each	99.00	
3009	Fixing in position copper alloy gate, globe and check valve, including all materials except valve and G.I. collar (as per item 3007) etc. complete-			Valves and G.I. collar will be supplied by the department.
	(a) 15 mm dia	each	69.00	
	(b) 20 mm dia	each	77.00	
	(c) 25 mm dia	each	83.00	
	(d) 32 mm dia	each	87.00	
	(e) 40 mm dia	each	99.00	
	(f) 50 mm dia	each	130.00	
	(g) 65 mm dia	each	239.00	
	(h) 80 mm dia	each	285.00	
	(i) 100 mm dia	each	436.00	
3010	Providing and fixing in position 150x150 mm G.I. best Indian make heavy duty surface box including, laying on 75 mm thick C.C. 1:5:8 embedding in II class T.M. brick masonry in C.M. 1:3 complete with all materials.	each	534.00	
3011	Labour only for item 3010	each	68.00	
3012	Providing and fixing in position ferrule for water services, IS : 2692 – 1978, with G.I. mouth cover including boring, taping the main etc. complete -			
	(a) 10 mm to 15 mm dia (for 15 mm pipes)	each	291.00	

Item No.	Item	Unit	Rate	Remarks
	(b) 15 mm to 20 mm dia (for 20 mm pipes)	each	349.00	
	(c) 20 mm to 25 mm dia (for 25 mm pipes)	each	425.00	
3013	Labour only for item 3012	each	151.00	
3014	Providing and fixing best Indian make G.I. elbow, IS : 1239 (Part II) 1969, with all materials complete -			
	(a) 15 mm dia	each	26.00	
	(b) 20 mm dia	each	31.00	
	(c) 25 mm dia	each	38.00	
	(d) 32 mm dia	each	57.00	
	(e) 40 mm dia	each	69.00	
	(f) 50 mm dia	each	100.00	
	(g) 65 mm dia	each	142.00	
	(h) 80 mm dia	each	204.00	
	(i) 100 mm dia	each	399.00	
3015	Labour only for item 3014 -			
	(a) Up to 65 mm dia	each	9.00	
	(b) 80 mm dia	each	11.00	
	(c) 100 mm dia	each	25.00	
3016	Providing and fixing best Indian make G.I. Tee equal, IS : 1239 Pat II 1969, complete with all materials -			
	(a) 15 mm dia	each	30.00	
	(b) 20 mm dia	each	36.00	
	(c) 25 mm dia	each	45.00	
	(d) 32 mm dia	each	59.00	
	(e) 40 mm dia	each	81.00	
	(f) 50 mm dia	each	115.00	
	(g) 65 mm dia	each	159.00	
	(h) 80 mm dia	each	242.00	
	(i) 100 mm dia	each	439.00	
3017	Labour only for item 3016 -			
	(a) Up to 50 mm dia	each	8.00	
	(b) 65 mm dia	each	12.00	

Item No.	Item	Unit	Rate	Remarks
	(c) 80 mm dia	each	17.00	
	(d) 100 mm dia	each	22.00	
3018	Providing and fixing in position best Indian make G.I. bend, IS : 1239 Part II 1969, complete with all materials -			
	(a) 15 mm dia	each	31.00	
	(b) 20 mm dia	each	38.00	
	(c) 25 mm dia	each	53.00	
	(d) 32 mm dia	each	80.00	
	(e) 40 mm dia	each	87.00	
	(f) 50 mm dia	each	104.00	
	(g) 65 mm dia	each	247.00	
	(h) 80 mm dia	each	344.00	
	(i) 100 mm dia	each	728.00	
3019	Labour only for item 3018 -			
	(a) Up to 50 mm dia	each	7.00	
	(b) 65 mm dia	each	10.00	
	(c) 80 mm dia	each	13.00	
	(d) 100 mm dia	each	24.00	
3020	Providing and fixing copper alloy bib cock, IS : 781 – 1977, complete with all materials -			
	(a) 15 mm dia	each	220.00	
	(b) 20 mm dia	each	360.00	
	(c) 25 mm dia	each	618.00	
3021	Labour only for item 3020 -	each	8.00	
3022	Providing and fixing copper alloy cock, complete with all materials -			
	(a) 15 mm dia	each	223.00	
	(b) 20 mm dia	each	362.00	
	(c) 25 mm dia	each	621.00	
3023	Labour only for item 3022 -	each	8.00	
3024	Providing and fixing chromium plated bib cock, complete with all materials -			
	(a) 15 mm dia	each	493.00	
	(b) 20 mm dia	each	674.00	

Item No.	Item	Unit	Rate	Remarks
	(c) 25 mm dia	each	883.00	
3025	Labour only for item 3024-	each	8.00	
3026	Providing and fixing in position best Indian make self closing heavy push cock, IS : 1711- 1970, complete with all materials -			
	(a) 15 mm dia	each	216.00	
	(b) 20 mm dia	each	333.00	
	(c) 25 mm dia	each	513.00	
3027	Labour only for item 3026-	each	8.00	
3028	Providing and fixing in position best Indian make G.I. complete with all materials -			
	(a) 15 mm dia	each	31.00	
	(b) 20 mm dia	each	41.00	
	(c) 25 mm dia	each	48.00	
	(d) 32 mm dia	each	61.00	
	(e) 40 mm dia	each	80.00	
	(f) 50 mm dia	each	113.00	
	(g) 65 mm dia	each	155.00	
	(h) 80 mm dia	each	206.00	
	(i) 100 mm dia	each	268.00	
3029	Labour only for item 3028-			
	(a) up to 50 mm dia	each	7.00	
	(b) 65 mm dia	each	9.00	
	(c) 80 mm dia	each	13.00	
	(d) 100 mm dia	each	24.00	
3030	Providing and fixing in position G.I. Union. IS : 1239 Part II – 1969, with all materials complete -			
	(a) 15 mm dia	each	62.00	
	(b) 20 mm dia	each	65.00	
	(c) 25 mm dia	each	86.00	
	(d) 32 mm dia	each	121.00	
	(e) 40 mm dia	each	177.00	
	(f) 50 mm dia	each	254.00	
	(g) 65 mm dia	each	393.00	

Item No.	Item	Unit	Rate	Remarks
	(h) 80 mm dia	each	639.00	
	(i) 100 mm dia	each	898.00	
3031	Labour only for item 3030-			
	(a) up to 65 mm dia	each	9.00	
	(b) 80 mm dia	each	11.00	
	(c) 100 mm dia	each	25.00	
3032	Providing and fixing chromium plated shower rose with 15 mm or 20-mm inlet complete.	each	393.00	
3033	Labour only for item 3032-	each	9.00	
3034	Providing and fixing water tight washer for bib cock and stop cocks –			
	(a) Leather of approved quality.	each	4.00	
	(b) Fibber of approved quality.	each	8.00	

CHAPET 31 – SEWERAGE AND DRAINAGE

Notes-

1. Rates include all leads and lifts for all materials.
2. The materials used shall conform to relevant I.S.S.
3. The rates include, wherever necessary, conveyance and delivery, handling, loading, unloading, storing, fabrication, hoisting, all necessary labour for finishing to required shape and size, fitting and fixing in position, cutting and waste and other incidental operations.
4. In case of septic tanks, items pertaining to excavation, concrete and masonry shall be paid as per relevant chapters.
5. Measurements :-
 - (i) All work shall be measured net as fixed to the nearest 0.01 m unless otherwise specified.
 - (ii) The pipe line shall be measured net as fixed, inclusive of all joints (measured along the center line) and no allowance shall be made for wastage etc.
 - (iii) Length of fittings shall not be included with measured length of the pipe line.
6. The following Indian Standards may be referred to: -

I.S. No.	Title
651-1992	Salt-glazed stone ware pipes and fittings (fifth revision).Re 2003
1626	Asbestos cement building pipes, pipe fittings, gutters and gutter fittings and roofing fittings.
1626(Pt. I) 1994	Pipes and pipe fittings (IInd revision). Re 2005
1626(Pt. I) 1994	Gutters and gutter fittings (IInd revision). Re 2005
1726-1991	Cast iron manhole covers and frames.(IIIrd revision) Re 2005
1726(Pt. I) 1974	General requirements (second revision).
1726(Pt. II) 1974	Specific requirements for H. D. circular type (second revision).
1726(Pt. IV) 1974	Specific requirements for M. D. circular type (second revision). (with amendment No. 1).
1726(Pt. V) 1974	Specific requirements for M. D. rectangular type (second revision).
1726(Pt. VI sec.-1) 1974	Specific requirements for L.D. rectangular type, Sec. 1 single seal (second revision).
1726 (pt. VI/Sec. 2) 1974	Specific requirements for L.D. rectangular type Sec 2 Double seal (Second revision)
1726 (Pt. VII/ sec.- 1)1974	Specific requirements for L.D. square type, Sec. 1 single seal (first revision).
2470	Code of practice for design and construction of septic tanks –
2470 (Pt. I)1985	Small installations (IInd revision). Re 2001
2470 (pt. II) 1985	Large installations (IInd revision). Re 2001

2527-1984	Code of practice for fixing rain water gutters and down pipes for roof drainage. Re 2000
4127-1983	Code of practice for laying of glazed stoneware pipes. Re 2001
5329-1983	Code of practice for sanitary pipe work above ground for buildings (with amendment No. 1). Re 2001
5455-1969	Cast iron steps for manholes. Re 2003
5961-1970	Cast iron gratings for drainage purpose. Re 2003
9872-1981	Precast concrete septic tanks. Re 2007

Item No.	Item	Unit	Rate	Remarks
3101	Providing and fixing on wall face asbestos cement building pipes conforming to IS: 1626 (Pt. I). including jointing with gasket or hemp yarn soaked in bitumen and cement mortar 1:2 including making necessary holes in walls and making it good, holder bat clamps etc; complete -			
	(a) 100 mm dia	m	172.00	
	(b) 80 mm dia	m	147.00	
	(c) 60 mm dia	m	127.00	
	(d) 50 mm dia	m	107.00	
3102	Labour only for item 3101	m	23.00	
3103	Fixing in position A.C. pipe with all materials except A.C. pipe and holder bat clamps etc; complete as per item 3101-			
	(a) 100 mm dia	m	38.00	
	(b) 80 mm dia	m	37.00	
	(c) 60 mm dia	m	35.00	
	(d) 50 mm dia	m	33.00	
3104	Providing and fixing in position A. C. pipe fittings conforming to IS : 1626 (Pt. II) including jointing with gasket or hemp yarn soaked in bitumen and cement mortar 1:2 including making necessary holes in walls holder bat clamps etc; complete -			
	(i) A. C. plain bend -			
	(a) 100 mm dia	each	231.00	
	(b) 80 mm dia	each	206.00	

Item No.	Item	Unit	Rate	Remarks
	(c) 60 mm dia	each	190.00	
	(d) 50 mm dia	each	182.00	
	(ii) Plug bend-			
	(a) 100 mm dia	each	262.00	
	(b) 80 mm dia	each	241.00	
	(c) 60 mm dia	each	218.00	
	(d) 50 mm dia	each	203.00	
	(iii) Single equal junction -			
	(a) 100 mm dia	each	423.00	
	(b) 80 mm dia	each	373.00	
	(c) 60 mm dia	each	350.00	
	(d) 50 mm dia	each	328.00	
	(iv) A. C. plug single junction -			
	(a) 100 mm dia	each	452.00	
	(b) 80 mm dia	each	405.00	
	(c) 60 mm dia	each	371.00	
	(d) 50 mm dia	each	346.00	
	(v) Double equal junction -			
	(a) 100 mm dia	each	592.00	
	(b) 80 mm dia	each	536.00	
	(c) 60 mm dia	each	476.00	
	(d) 50 mm dia	each	444.00	
	(vi) Double plug junction -			
	(a) 100 mm dia	each	627.00	
	(b) 80 mm dia	each	570.00	
	(c) 60 mm dia	each	513.00	
	(d) 50 mm dia	each	479.00	
	(vii) Plain off sets of swan neck with 75 mm projection -			
	(a) 100 mm dia	each	232.00	
	(b) 80 mm dia	each	196.00	
	(c) 60 mm dia	each	194.00	
	(d) 50 mm dia	each	303.00	
	(viii) Plain off sets of swan neck with 100 mm projection -			

Item No.	Item	Unit	Rate	Remarks
	(a) 100 mm dia	each	246.00	
	(b) 80 mm dia	each	214.00	
	(c) 60 mm dia	each	182.00	
	(d) 50 mm dia	each	164.00	
	(ix) A. C. Shoes -			
	(a) 100 mm dia	each	211.00	
	(b) 80 mm dia	each	190.00	
	(c) 60 mm dia	each	182.00	
	(d) 50 mm dia	each	175.00	
	(x) A. C. loose socket -			
	(a) 100 mm dia	each	62.00	
	(b) 80 mm dia	each	55.00	
	(c) 60 mm dia	each	54.00	
	(d) 50 mm dia	each	53.00	
3105	Labour only for item No. 3104-			
	(a) Bends off – sets or swan neck shoes	each	34.00	
	(b) A. C. plain equal junction and plug junction.	each	68.00	
	(c) Double equal junction and plug junction	each	120.00	
	(d) Loose socket.	each	8.00	
3106	Providing and fixing in position A. C. cowls conforming to IS : 1626 (Pt. II) with gasket and cement caulked joints etc; complete -			
	A – Slotted vent Cowls -			
	(a) 100 mm dia	each	135.00	
	(b) 80 mm dia	each	130.00	
	(c) 60 mm dia	each	123.00	
	(d) 50 mm dia	each	117.00	
	B – Cone cap cowls -			
	(a) 100 mm dia	each	152.00	
	(b) 80 mm dia	each	147.00	
	(c) 60 mm dia	each	140.00	
	(d) 50 mm dia	each	128.00	
3107	Labour only for item 3106 -	each	11.00	

Item No.	Item	Unit	Rate	Remarks
3108	Providing and fixing in position 60 cm long A. C. drain spout, 1626 (Pt. II), complete including making holes in walls repairing the same in C.M. 1:2 (invert level of the spout to be 25 mm below the top of the slab level):-			
	(a) 50 mm dia	each	116.00	
	(b) 75 mm dia	each	139.00	
3109	Labour only for item 3108 –	each	18.00	
3110	Providing and fixing in position 100 mm dia salt glazed, stone ware pipes, IS: 651 (Grade ~ 'A'), half jointed with cement caulked joints in C.M. 1:3 laid in proper gradient etc; complete including filling 40 mm metal up to 30 cms, below ground level, providing bamboo matting, gober leaped on both sides filling earth from spoils in trenches, for disposal trenches, up to 1.2 m depth.	m	316.00	
3111	Add extra rate for item 3110 for additional depth of 30 cm.	m	9.80	
3112	Labour only for item 3110 -	m	13.00	
3113	Providing and laying in position bamboo matting in disposal trenches including gober leaping on both sides complete.	sqm	23.00	
3114	Labour only for item 3113 -	sqm	2.20	
3115	Providing and fixing in position 100 mm dia half round salt glazed S.W. pipes IS : 651 (Grade - A), for surface drain embedded in 40 cm x 10 cm. base cement concrete 1:5:8 and jointed with cement mortar 1:3 complete.	m	188.00	
3116	Labour only for item 3115 -	m	9.00	
3117	Providing and fixing in position 15 cm half round S.W. pipe, IS : 651 (Grade - A), 60 cm long, with cement mortar 1:2 embedded in cement concrete 1:5:8 with 40 mm metal complete.	m	311.00	
3118	Labour only for item 3117 -	m	18.00	
3119	Providing laying and fixing in position salt glazed S.W. full round pipe, IS: 651 (Grade - A), with cement mortar 1:2 with spun yarn or gasket laid under ground			

Item No.	Item	Unit	Rate	Remarks
	over 15 cm cement concrete 1:4:8 and encased in proper gradient including excavation of trenches up to 2 m depth-			
	(a) 100 mm dia	m	464.00	
	(b) 150 mm dia	m	519.00	
3120	Add extra to item 3119 for every extra 0.3 m depth.	m	10.90	
3121	Labour only for item 3119 –			
	(a) 100 mm dia	m	20.00	
	(b) 150 mm dia	m	24.70	
3122	Providing and fixing in position S. W. intercepting traps with square ends to interception arm for building flush into manholes and setting in cement concrete 1:5:8 (40 mm graded metal) of width and thickness as for pipes of the same dia and hunching after setting, clearing arms to include – glazed ware stopper – with G.I. chain hook and ring complete -			
	(a) 100 mm dia	each	587.00	
	(b) 150 mm dia	each	627.00	
3123	Labour only for item 3122 -	each	201.00	
3124	Providing and fixing in position 100 mm dia C.I. nahani trap with hinged perforated cover complete with gasket and caulked joints, including making necessary chases and holes in floors and walls and repairing the same to original condition complete –	each	221.00	
3125	Labour only for item 3124 –	each	68.00	
3126	Providing and fixing square mouthed S.W. gully trap, IS : 651, (Grade 'A') complete with C.I. grating brick masonry chamber and water tight C.I. cover frame 30x30 cm size (in side) the weight of cover to be not less than 4.53 kg and frame be not less than 2.72 kg as per standard design including excavation etc; complete –	each	831.00	
3127	Labour only for item 3126	each	337.00	

Item No.	Item	Unit	Rate	Remarks
3128	Constructing manhole in brick masonry in C.M. 1:5 with RCC top slab in 1:2: 4 mix, with graded metal of 20 mm maximum size, Foundation concrete 1:4:8 mix, with graded metal of maximum size 40 mm, 12 mm. thick plastering in C.M. 1:3 finished with a floating coat of neat cement and making channels in cement concrete 1:2:4 mix, with aggregate of maximum size 20 mm neatly finished complete -			
	(a) Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 445x610 mm internal dimensions, total wt of cover and frame 38 kg (weight of cover 23 kg and wt. of frame 15 kg.).	each	4832.00	
	(b) Inside size 90x80 cm and 60 cm deep including C.I. cover with frame (light duty) 445x610 mm internal dimensions, total wt of cover and frame 38 kg (weight of cover 23 kg and wt. of frame 15 kg.).	each	5186.00	
	(c) Inside size 1.2 m x 90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500mm internal diameter, total wt of cover and frame to be not less than 116 kg (weight of cover 58 kg and wt. of frame 58 kg.).	each	11047.00	
	(d) Inside size 1.2 m x 90 cm and 90 cm deep including C.I. cover with frame (heavy duty) 560 mm internal diameter, total wt of cover and frame to be not less than 255 kg (weight of cover 140 kg and wt. of frame 115 kg.).	each	17218.00	
3129	Providing and fixing in position C.I. manhole cover and frames, IS :7267 embedded in RCC cover and slab all exposed edges rounded and finished in CM 1:3 etc; complete -			
	(a) Fixing manhole cover light duty with frame 38 kg.	each	1359.00	
	(b) Fixing manhole cover with heavy duty with frame 116 kg.	each	4836.00	

Item No.	Item	Unit	Rate	Remarks
3130	Providing and fixing in position C.I. stand and steps (IS: 5455).	each	62.00	
3131	Providing and fixing in position 100 mm S. W. glazed "Tee" with necessary clamps etc; in septic tanks.	each	334.00	
3132	Labour only for item 3131 –	each	108.00	

CHAPTER 32 - SANITARY FITTINGS

Note: -

1. The rates include –
 - (a) All lead and lifts for all materials.
 - (b) Cost of labour for installation, materials, tools and plants necessary to complete the job.
 - (c) Cost of making holes in walls, excavation, cutting of floors and making good the same to its original condition.
2. The rates also, include, wherever necessary, conveyance and delivery, handling, loading and unloading, storing, fabrication, hoisting, all necessary labour for finishing to required shape and size, fitting and fixing in position, cutting and waste and other incidental operations.
3. The materials shall conform to relevant ISS.
4. The following Indian Standards may be referred to :-

I.S. No.	Title
771 (Pt. II) - 1985	Glazed fire – clay sanitary appliances, Pt. II Specific requirements of kitchen and laboratory sinks (third revision).Re1998
772-1973	General requirements for enameled cast iron sanitary appliances (second revision)(with amendment No.1). Re2003
774-2004	Flushing cisterns for water – closets and urinals (valve less syphonic type) (fifth revision) (with amendment Nos. 1 to 5).
775-1970	Cast iron brackets and supports for wash basins and sinks (second revision). Re2000
2064-1993	Code of practice for selection, installation and maintenance of sanitary appliances (second revision). Re2002
2326-1987	Automatic flushing cisterns for urinals (IInd revision). Re2003
2548-1996	Plastic water closet seats and covers (fifth revision). Re2006
2556-	Vitreous sanitary appliances (vitreous china).
2556 (Pt. I) 1994	General requirements (third revision) (with amendment No. I).
2556-(Pt. II) 1994	Specific requirements of wash down water – closets (fourth revision). Re1999
2556-(Pt. III) 1994	Specific requirements of squatting pans (fourth revision).
2556-(Pt.IV) 1994	Specific requirements of wash basins (third revision). Re1999
2556(Pt.V) - 1994	Specific requirements of laboratory sink (IInd revision). Re1999
2556(Pt.VI/ Sec.I)- 1995	Specific requirements of urinals Section 1. Bowl type (IV revision). Re1998
2556(Pt.VI/ Sec.II)- 1995	Specific requirements of urinals Section 2. Half stall urinals (Second revision).

I.S. No.	Title
2556(Pt.VI/ Sec.III)- 1995	Specific requirements of urinals Section 3. Squatting plates.
2556(Pt.VI/ Sec.IV)- 1995	Specific requirements of urinals Section 4. Partition slabs (second revision) (with amendment No. I).
2556(Pt.VI/ Sec.V)- 1995	Specific requirements of urinals Section 5. Waste fittings (second revision).
2556(Pt.VI/ Sec.VI)- 1995	Specific requirements of urinals Section 6. Water spreaders for half stall urinals (second revision).
2556(Pt.VII)- 1995	Specific requirements of half round channel (IIIrd revision). Re1998
2556(Pt.VIII)-1995	Specific requirements of syphonic wash-down water closets (IV revision) (with amendment No. I.) Re1998
2556(Pt. IX)-1995	Specific requirements of bidets (IV revision). Re2000
2556(Pt. X)-1979	Specific requirements of foot rests (second revision).
2556(Pt. XI)-1973	Specific requirements for floor traps.
2556(Pt.XIII)-1973	Specific requirements of traps for squatting pans (with amendment No. 1).
2556(Pt.XIV)1995	Specific requirements of traps for integrated squatting pans (with amendment No. 1). Re2005
2556(Pt.XV)-1995	Specific requirements of universal water closets (with amendment No. I and 2). Re1999
2963-1979	Copper alloy waste – fittings for wash basins and sinks (first revision). Re2003
3311-1979	Waste plug and it's accessories for sinks and wash basins (first revision) Re2003
5961-1970	Cast iron gratings for drainage purposes (reaffirmed 2003).
7231-1974	Plastic flushing cisterns (valve less syphonic type) for water closets and urinals.(II revision) Re2004
8718-1978	Vitreous enameled steel kitchen sinks. Re2000
8727-1978	Vitreous enameled steel wash basins. Re2000
9440-1979	Vitreous sanitary appliances (vitreous china) methods of sampling of. Re2000
9758-1981	Flush valves and fittings for water closets and urinals. Re2003

Item No.	Item	Unit	Rate	Remarks
3201	Providing and fixing white vitreous china water closet squatting pan (Indian type) 580 mm size, IS: 2556 (Pt. II), with "P" or "S" trap with pair of foot rest, 25x13x3 cm, in white vitreous china, 12.5 liters mosquito proof C.I. flushing cistern, IS: 774, with 15 mm lead inlet and overflow with 15 mm lead inlet connection not less than 40 cm in length and 15 mm C.P. brass heavy stop cock IS : 781, G.I pull and chain,	each	4768.00	

Item No.	Item	Unit	Rate	Remarks
	32 mm galvanised steel telescopic flush pipe or one piece 40 mm lead pipe with G.I. clamps and brass unions, 15 mm overflow pipe with necessary brass fittings and G.I. clamps for fitting it to wall, up to floor level, including all soldered and other joints filling of brick lime coba under the pan, making the holes in floors and walls and repairing the same with C.M. 1:3 plaster, repairing etc; to the original condition and approved type painting of system pipes and fittings complete.			
3202	Labour only for item No. 3201	each	376.00	
3203	Dry flush sweeper less latrine for single unit complete, with all accessories, water seal arrangement, 50 mm dia vent pipe, wire cowl 15 cm x 10 cm dia outlet pipe, complete to be connected to a septic tank, inclusive of all labour, material and transport expenses etc. complete as per specifications.	each	2250.00	
3204	Dry flush sweeper less latrine for two or more units complete, with all accessories, water seal arrangement, 50 mm dia vent pipe, wire cowl 15 cm x 10 cm dia outlet pipe, fitted to septic tank or soak pit etc., inclusive of all labour, material and transport expenses etc. complete as per specifications.	each	2125.00	
3205	Providing and fixing in position, white vitreous china (India type) 580 mm W.C. pan, IS: 2556 (Pt. II), with – “P” or “S” trap including removing the existing W.C. pan, if necessary, and making connection with other accessories such as flush pipe, outlet pipe and anti syphonic pipe fittings in cement concrete 1:4:8 in W.C. room, complete including making chases and holes in walls and floors, repairing the same in cement mortar 1:3 plastering etc. to the original condition and painting of fittings etc; complete.	each	1764.00	
3206	Labour only for item 3205	each	135.00	

Item No.	Item	Unit	Rate	Remarks
3207	Providing and fixing in position, 25x13x3 cm pair of white vitreous china foot rest, IS: 2556 (Pt. X), for squatting pan closet including removing the existing foot rest, if any, and making chases in floors and repairing the same in CM. 1:3.	each	205.00	
3208	Labour only for item 3207	each	14.00	
3209	Providing and fixing 12.5 liters high level G.I. flushing cistern IS: 774, with all integral fittings such as ball valves, ball lever, G.I. chain and pull complete, removing the existing cistern and brackets, if necessary, and making connection with the cistern to the flush pipe inlet and overflow pipes etc; complete including making necessary chases and holes in walls and repairing the same in cement mortar 1:3 to it's original condition and painting of cistern and fittings complete.	each	1678.00	
3210	Providing and fixing in position white vitreous flat back or wall corner type lipped (range of 3 units) front urinal basin of 43x26x35 cm and 34x43x26.5 cm sizes respectively, IS : 2556 (Pt.-VI), with 10 litter's C.I. automatic flushing cistern, IS : 774, with fittings, R.S. or C.I. brackets, standard size C.I. flush pipe for back and front flush standard spreader pipes with fittings G.I. clamps, white vitreous tiling, 1200 mm high to front and side walls with white vitreous china tiles, corners and angle set in neat cement, standard urinal C.I. trap 65 mm dia with vent arm and outlet grating and coupling in C.P. brass complete., including painting the cistern and fittings, cuttings and making good the walls and floors etc; where required.	each	8739.00	
3211	Providing and fixing in position white vitreous flat back lipped urinals (range of 2 units) size 43x26x35 cm, IS: 2556 (Pt. VI) with 10 litter's C.I. automatic flushing cistern, IS : 774, with fittings, RS or C.I. brackets, standard size C.I. flush pipe for back and front flush with spreader pipes with fittings G.I. clamps,	each	5504.00	

Item No.	Item	Unit	Rate	Remarks
	white vitreous tiling, 1200 mm high to front and side walls with white vitreous china tiles, corners and angles set in neat cement, standard urinal C.I. trap 65 mm dia with vent arm and outlet grating and coupling in C.P. brass trap and unions complete., including painting of the cistern and fittings, cuttings and making good the walls and floors etc; where required.			
3212	Providing and fixing in position white vitreous flat back lipped urinals (range of one unit) size 43x26x35 cm IS : 2556 (Pt.-VI), with 5 litter's capacity C.I. automatic flushing cistern, IS : 774, with fittings, R.S. or C.I. brackets, standard size C.I. flush pipe for back and front flush with spreader pipes with fittings G.I. clamps, white vitreous tiling, 1200 mm high to front and side walls with white vitreous china tiles, corners and angles set in neat cement, standard urinal C.I. trap 65 mm dia with vent arm and outlet grating and coupling in C.P. brass trap and unions complete., including painting the cistern and fittings, cuttings and making good the walls and floors etc; where required.	each	3246.00	
3213	Labour only for item 3210	each	953.00	
3214	Labour only for item 3211	each	682.00	
3215	Labour only for item 3212	each	443.00	
3216	Providing and fixing white vitreous flat back lipped urinal 44x36.5 x27.5 cm size, removing the existing urinal, if necessary, making connection of the urinal to its accessories such as inlet pipe, trap etc, complete including making holes in walls repairing the same in C.M. 1:3 plastering etc. to the original condition and approved paintings of fittings etc; complete.	each	1284.00	
3217	Labour only for item 3216	each	101.00	
3218	Providing and fixing in position high level C.I. automatic flushing cistern with corner brass regulating supply tap and wings for screwing to walls or C.I. painted brackets including making			

Item No.	Item	Unit	Rate	Remarks
	necessary, holes in walls and repairing the same in C.M. 1:3 plastering etc; to its original condition, making connection of the cistern to flush pipe/and over flow pipe etc. and removing the existing cistern, if necessary, and approved painting of cistern and accessories complete-			
	(a) 15 litres	each	2104.00	
	(b) 10 litres	each	1534.00	
	(c) 5 litres	each	1078.00	
3219	Labour only for item 3218	each	133.00	
3220	Fixing only in position flat back lipped urinals range with all the accessories as detailed in item 3210, 3211 and 3212 including all soldered and other joints making chases and other holes in floors and walls repairing the same with cement mortar 1:3 plastering etc; to the original condition approved painting of cistern and fittings etc; complete.			Urinals, flushing cistern, C.I. brackets, Flush pipe spreaders, G.I. branches 32 mm lead waste pipe thimble and socket piece, 15 mm lead connection, to be supplied by the department.
	(a) 3 unit	each	1177.00	
	(b) 2 unit	each	906.00	
	(c) 1 unit	each	668.00	
3221	Fixing only in position flat back lipped urinal basin, removing of the existing urinals basin, if necessary, making connection to the flush pipe, waste pipe etc; complete, including making holes, in walls repairing the same with C.M. 1:3 plastering etc; to the original condition complete.	each	225.00	Urinal basin will be supplied by the, department.
3222	Fixing only, in position C.I. flushing cistern, removing the existing cistern and brackets, if necessary, making connection of the cistern to the flush pipe, etc; complete including making necessary chases and holes in walls, repairing the same in cement mortar 1:3 plastering etc; to the original condition, approved painting of cistern complete.	each	341.00	

Item No.	Item	Unit	Rate	Remarks
3223	Painting the cistern with anticorrosive paint inside and white paint over a coat of ready mixed primer of approved quality on the out side surface of cistern flush pipe, brackets and other fittings.	each	189.00	
3224	Providing and fixing white vitreous china wash basin 55x40 cm size, IS: 2556 (Pt-IV), with R.S. or C.I. bracket, conforming to I.S. 775, painted with enamel or aluminum paint, 15 mm C.P. brass pillar taps and C.P. brass chain with rubber plug, 32 mm brass waste coupling, 15 mm lead inlet connection with less than 40 cm in length with 15 mm dia brass heavy duty stop cock, 32 mm G.I. trap and brass cleaning thimble up to and outside wall till gully trap or drain pipe with G.I. clips including 40 mm G.I. pipe sleeve previously embedded in correct position complete with all joints and making chases and holes in floors repairing the same with CM 1:3 plastering etc; to the original condition and painting of fittings etc. complete.	each	2280.00	
3225	Labour only for item No. 3224	each	180.00	
3226	Fixing only, in position, wash basin and its accessories, complete, with necessary soldered and other joints making chases and holes in walls, floors and repairing the same in CM. 1:3 plastering etc; to the original condition including painting of fittings etc; complete.	each	195.00	Wash basin, C.I. brackets pillar tap & 32 mm waste coupling with plug & chain 15 mm lead inlet connection 15 mm brass heavy stop cock 32 mm lead waste pipe as per item 3224, to be supplied by the department.
3227	Fixing only in position wash basin excluding its accessories, but including making chases and holes in walls and repairing the same in C.M. 1:3 plastering etc; to the original condition making connection of basin to waste pipe and removing the existing basin safely If necessary, and painting of fittings etc. complete.	each	100.00	

Item No.	Item	Unit	Rate	Remarks
3228	Providing and fixing white glazed vitreous china lavatory basin, without brackets and other accessories but including making necessary holes and chases in walls and floor, repairing of the same in C.M. 1:3 plastering etc, to the original condition, making connection of the basin to waste pipe, including the painting of fittings etc; complete in all respects as per item 3224.	each	1123.00	
3229	Providing and fixing C.P. chain and 32 mm hard rubber plug only for wash basin complete.	each	48.00	
3230	Providing and fixing in position 15-mm nozzle chromium plated screw down pillar valve, fitted and fixed to the basin complete.	each	212.00	
3231	Providing and fixing 32 mm C.P. brass waste coupling including making connection to the waste pipe, etc;	each	104.00	
3232	Providing and fixing 'P' or 'S' trap C.P. below the wash basin including making necessary connection to waste pipe and waste coupling complete.	each	202.00	
3233	Labour only for item 3228	each	84.00	
3234	Providing and fixing in position laboratory type plain edge sink of white fire clay I.S. : 771 – (Pt. II), with outlet and their overflow, enamel aluminum painted C.I. brackets, fixed to wall with wooden blocks 40 mm C.P. waste coupling with C.P. chain 50 cm long and hard rubber plug, 40 mm G.I. waste pipe with G.I. trap and brass cleaning thimble up to the outside of wall till gully trap or drain pipe with G.I. pipe sleeve previously embedded in correct position complete with all joints and making chases and holes in floors and walls repairing the same with C.M. 1:3 plastering and coloring and painting of fittings etc; complete -			
	(a) Sink 60x45x20 cm	each	4211.00	
	(b) Sink 45x30x15 cm.	each	2802.00	
3235	Labour only for item 3234	each	437.00	

Item No.	Item	Unit	Rate	Remarks
3236	Fixing only in position laboratory type plain edge sink with all materials as detailed in 3234 excluding sink, C.I. brackets, 15 mm brass coupling with plug and chain, 40 mm C.I. pipe complete including soldered and other joints making chases and holes in floor's and walls repairing the same in C.M. 1:3 plastering etc; complete.	each	447.00	Sink C.I. brackets 15 mm brass coupling with plug and chain 40 mm G.I. waste pipe will be supplied by the department.
3237	Providing and fixing in position kitchen plain edge sink white fire clay, IS: 771 (Pt. II) with outlet and over flows with enamel or aluminum painted C.I. brackets fixed to wall with wooden blocks, 40 mm C.P. waste coupling with C.P. chain and hard rubber plug, 40 mm G.I. waste pipe with G.I. traps and brass cleaning thimble up to the outside wall till gully trap or drain pipe sleeve previously embedded in correct position complete with all joints and making chases and holes in floors and walls repairing the same with C.M. 1:3 plastering and coloring to the original condition and painting of fittings etc; complete –			
	(a) Sink 60x45x25 cm	each	4211.00	
	(b) Sink 45x30x15 cm	each	2802.00	
3238	Labour only for item 3237	each	437.00	
3239	Fixing only in position kitchen plain edge sink with all materials as detailed in item 3234 but excluding sink, C.I. bracket, 15 mm brass coupling with plug and chain, 40 mm G.I. pipe, complete including soldered joints making chases and holes in floors and walls and making good the same in C.M. 1:3 plastering etc; complete.	each	447.00	
3240	Providing and fixing in position a pair of enamel painted C.I. brackets to various size wash hand basins with T.W. plugs with screws etc, making holes in walls and repairing the same with cement mortar 1:3 plastering to the original condition including removing the old pair of brackets, fittings etc; complete and prefixing the same.	each pair	164.00	
3241	Labour only for item 3240	each pair	50.00	

CHAPTER 33 – MISCELLANEOUS ITEMS OF SANITARY AND WATER SUPPLY

Notes:-

1. The rates include all lead and lifts for all materials.
2. All materials shall conform to relevant ISS.

Item No.	Item	Unit	Rate	Remarks
3301	Providing and fixing in position C.P. brass towel rail complete with brackets including making chases in walls and repairing the same in C.M. 1:3 complete-			
	(a) 750x20 mm	each	346.00	
	(b) 600x20 mm	each	277.00	
	(c) 450x20 mm	each	255.00	
3302	Labour only for item 3301	each	46.00	
3303	Providing and fixing soap dish chromium plated with brackets fixed wooden cleats, with brass screws complete including making chases in walls and repairing the same with cement mortar 1:3.	each	161.00	
3304	Providing and fixing in position 15-mm dia. inlet lead connection 45 cm long including making connection to cistern with soldered joints etc; complete.	each	99.00	
3305	Labour only for item 3304	each	35.00	
3306	Supplying of mild steel tanks made out of 10 G.H.R. sheet fitted with inlet and outlet wash out overflow and manhole duly painted with anticorrosive paints (excluding cost of staging) -			
	(a) 1200 x 1200 x 1200 mm	each	11698.00	
	(b) 2400 x 2400 x 2400 mm	each	19973.00	
	(c) 2400 x 900 x 900 mm	each	17348.00	
	(d) 3000 x 1200 x 1200 mm	each	22826.00	

Item No.	Item	Unit	Rate	Remarks
3307	Providing and fixing A. C. water tank of approved dimensions on the top of the structure with made up platform up to height of 10 m with provision for inlet, delivery, wash and overflow -			
	(a) 1070x760x355 mm size 225 liter each capacity.	each	2397.00	
	(b) 1070x760x635 mm size 450 liter each capacity.	each	3196.00	
	(c) 1200x915x685 mm size 675 liter each capacity.	each	4679.00	
3308	Providing and placing on terrace (up to floor two level) R.C.C. circular tank as per standard designs of Hindustan Housing Factory with cover and necessary holes but without fittings -			
	(a) 270 liter capacity	each	3150.00	
	(b) 540 liter capacity	each	4930.00	
3309	Add extra for placing R.C.C. circular tank on the terrace above floor two terrace for item 3308 -			
	(a) 270 liter capacity	each	157.00	
	(b) 540 liter capacity	each	247.00	
3310	Providing and construction of R.C.C. overhead water storage tank, of approved dimensions up to 10 m height for 13500 to 22500 liter capacity with provision for inlet, delivery, wash and over flow connections with covering slab and cast iron manhole cover 75 cm x 45 cm (light type) with locking arrangement including finishing inside surface with water proofing cement plaster in all comers and making joints smooth finished.	each	9.00	
3311	Providing and fixing 600x450 mm-beveled edge mirror of superior glass (of approved quality) complete with 6 thick asbestos sheet ground fixed to wooden cleats with C.P. brass screws and washes.	each	542.00	

Item No.	Item	Unit	Rate	Remarks
3312	Constructing with II class TM. Brick masonry open surface drain in cement mortar 1:4 including earth excavation, 10 cm. Thick bed concrete 1:5:10 with 40 mm metal and 25 mm thick cement concrete 1:2:4 for filling haunches including 12 mm cement plaster 1:4 with a floating coat of neat cement inside the drain, its top and exposed side including disposal of surplus earth complete:-			
	(a) 10 cm drain 20 cm average depth	m	243.00	
	(b) 15 cm drain 20 cm average depth	m	256.00	
	(c) 25 cm drain 30 cm average depth	m	354.00	
3313	Constructing II class T. M. Brick masonry open surface drain in cement mortar 1:4 including earth excavation with semi circular S. W. glazed channel fixed with cement mortar 1:1 over a bed of 10 cm thick cement concrete 1:5:10 with 40 mm graded metal including filling spaces under edges with cement concrete 1:2:4 with 12.5 mm graded metal and 12 mm cement plaster 1:4 with a floating coat of neat cement over exposed surface of masonry including disposal of surplus earth complete -			
	(i) 10 cm drain 20 mm average depth with 10 cm S.W. glazed channel.	m	307.00	
	(ii) 15 cm drain 20 cm average depth with 15 cm S.W. glazed channel.	m	345.00	
	(iii) 25cm drain 30 cm average depth with 25 cm S.W. glazed channel.	m	471.00	
3314	Extra for additional one cm average depth of drain -			
	(i) 10 cm drain	m	6.00	
	(ii) 15 cm drain	m	6.00	
	(iii) 25 cm drain	m	6.00	

CHAPTER 34 – ELECTRICAL WORK WIRING AND CABLE DRAWING

Notes:-

1. General :-
 - (a) Rates include all lead and lift, for all materials, for all items, unless otherwise specified.
 - (b) The provision of scaffolding or ladder or any tools and plants required shall be deemed to be included in the items, unless otherwise stated.
 - (c) Excavation for poles, underground cables, concreting in foundations, painting of poles, struts etc., shall be measured separately.
 - (d) Cutting through walls and floors, lifting up floor boards and re fixing, cutting out plaster and making good all the work disturbed, notching or drilling holes through joists, etc., shall be included with the item of work.
2. Point Wiring :-
 - (a) Concealed conduit work shall include embedding the conduit and allied fittings in walls, floors etc., during construction or cutting chases, or both and making good as necessary.
 - (b) The work shall be strictly carried out in accordance with the detailed layout plan of electrical installation, unless otherwise necessary to be altered due to site conditions during the course of execution.
 - (c) Completion plans for the installation carried out shall be furnished.
 - (d) Point wiring shall include all work necessary to complete wiring of a switch circuit of any length from the tapping point on the distribution circuit to the following Via the switch :-
 - (i) Ceiling rose or connector (in case of ceiling and exhaust fan points or stiff pendant);
 - (ii) Ceiling rose (in the case of pendant point except stiff pendant points);
 - (iii) Socket outlet (in the case of socket outlet points);
 - (iv) Lamp holder (in the case of wall brackets, batten points, bulk head fittings and similar other fittings);
 - (v) Call-bell or buzzer (in this case the words 'Via the switch' shall be read as 'Via the bell push or ceiling rose as the case may be'); and
 - (vi) Up to electric clock outlet.
 - (e) When there is only one point on the distribution circuit (one way) the same shall be measured in two parts, one circuit wiring according to the definition of the 'circuit wiring, and the other points according to the above definition for 'points'.
 - (f) The following shall be deemed to be included in the point wiring :-
 - (i) Switch and ceiling rose or connector with special and suitable round block /Board for neatly housing the connector as required;
 - (ii) In the case of wall brackets, bulkhead fittings and similar fittings, cable as required up to the holder;

- (iii) Bushed conduit tubing when cables pass through walls etc;
 - (iv) Earth wire from 3-pin socket point to the common earth including connections to the earth pin of 3-pin socket outlet except the earth wire from the first tapping of live wire to the sub-distribution board'
 - (v) All wood or metal blocks, boards and boxes sunk or surface type, with suitable covering, including those required, for mounting fan regulator but excluding those under the distribution board and main control switch;
 - (vi) All fixing accessories such as screws, Phil plug, rawl plug, wooden plug etc. as required;
 - (vii) Joint for junction boxes and connecting the same as required; and
 - (viii) Connections to ceiling rose or connector, socket outlet, lamp holder, switch, fan regulator, etc.
- (g) The mechanical protection provided to the wiring coming within 1.5 m. from floor level or up to switch board shall be deemed to have been included in the item of work. Method of installation and making good the damages shall be described in the specification.
- (h) Wiring points shall be classified as follows:-
- (a) Short points not exceeding 3 m. in length.
 - (b) Medium points exceeding 3 m. but not exceeding 6 m. in length.
 - (c) Long points exceeding 6 m. but not exceeding 10 m. in length.
 - (d) Special points of length exceeding 10 m. in length as required.
- (i) The terms "Length per point" in point wiring in the case of fan points, light points and socket outlets shall mean the distance between the switch and ceiling rose, connector or back plate, lamp holder or socket-outlet point depending upon the fitting measurement along the run of wiring irrespective of the number of wires in the run. Separate measurement may be made where the switches and socket outlet points are located on the same board.
- (j) In case of boards with socket/outlet point only, the length shall mean the distance between the socket-outlet and the tapping point of live wire on the nearest switch board or junction box, as the case may be.
- (k) Any junction box provide for extending the wiring beyond the point referred to, shall not be treated as the nearest tapping point.
- (l) Special-points such as staircase lighting, group control, etc., shall be specified separately and so measured.
- (m) A light point controlled by two-way switches shall be measured as two points from the fittings to switches on either side and classified according to the "length". Any extra light point in the same circuit shall be considered as given below in (n).
- (n) In case of points with more than one light point controlled by the same switch, such points shall be measured in parts; i.e. from the switch to the first light point classified as one point and for the subsequent points, the distance from the fitting to fitting shall be measured along the run of wiring classified and treated as equivalent to half the point so derived.

- (o) In case of call-bell/buzzer controlled by more than one push, the length of point shall be measured in parts i.e. from the call bell/buzzer to one of the nearest pushes classified as one point and for the other pushes, the distance from each push to the call-bell shall be measured along the run of wiring classified and treated as equivalent to half the point so derived.
- (p) Where more than one call-bell/buzzer points are controlled by the same push, the length of the points shall be measured as enumerated in 2 (n).

3. Circuit Wiring :-

- (a) Length of wiring from the distribution board of sub-distribution board up to the tapping point of the first point, that is, up to first switch board shall be considered as circuit wiring. The length of circuit wiring with two wires shall be measured from the distribution or sub-distribution board to the first switch board in the circuit irrespective of whether the neutral conductor goes into the switch box or not. The earth wire from the distribution or sub-distribution board up to the first tapping point shall be measured separately.
- (b) In case of exclusive socket outlet circuits such as wiring points for power plugs, the length of points shall be the distance between the socket outlet and the tapping point of live wire in the nearest distribution or sub-distribution board and hence on separate measurement need be taken either for circuit wiring or for earth-continuity conductor. Except as described above, different types of wiring shall be measured separately and given in running meters. The length shall be the actual length of wiring installed and the number and size of cable shall be stated.
- (c) The lengths of sub-main, circuit wiring or any other type of wiring on linear basis shall include all lengths from end to end, wood casing and capping, wood batten or conduits as the case may be, exclusive of inter-connection inside the switch board, etc. The increase on account of diversion or slackness shall not be included in the measurement.

4. Cables :-

- (a) Cable shall be classified according to their voltage, materials, size and type of insulation, armour etc. Each type of cable shall be described and measured separately.
- (b) The length measured shall be actual length fixed or laid including connections up to switch for all cables other than paper-insulated, lead-covered cables and up to the entry point of cables end-box of PILC cables.
- (c) Cables shall be described and given in running meters. Terminal and joint boxes of various types shall be enumerated and measured separately according to their size and type.
- (d) The mechanical protection for cables on walls or floors or underground shall be measured separately and the description shall include the necessary excavation, method of installation and making good damages to the original finish.
- (e) Manholes shall be described and enumerated separately.

5. TRS or VIR TBC cables can be permitted to be used at the same rates of PVC cables.

6. Power wiring shall be done in steel conduit system.

7. Extra over rate to be adopted when the 2.5 sqmm multicore copper wire provided for point wiring in place of 1.5 sqmm aluminium conductor.

For short point wiring	Rs 60.00 should be adopted
For medium point wiring	Rs 120.00 should be adopted
For long point wiring	Rs 200.00 should be adopted
For special point wiring	Rs 280.00 should be adopted
2.5 sqmm multicore copperwire	Rs 10.00 per meter

In item of work "1.5 sqmm PVC insulated cable with aluminium conductor" will be replaced by 2.5 sqmm PVC insulated cable with copper multicore flexible wire.

The following Indian Standards may be referred to:

CHAPTER 34 TO 39 (DEALT AS CHAPTER - 34) ELECTRICAL WORKS.

I.S.No.	Title
IS:347-1975	Varnish shellac, for general purpose (first revision)(Re 2001)
IS:374-1979	Electrical ceiling type fans and regulators (Third Revision) (with Amendment No. 1) (Re 2000)
IS:375-1963	Marking and arrangement for switchgear bus bars, main connections and auxiliary wiring (Revised with amendment No. 1)
IS:1258-1979	Bayonet lamp holders (second revision) with amendment No.1)
IS:1358-1967	Three pin plugs and sockets outlets (first revision) with amendment No. 1 to 5) (Re 2006)
IS:2032-(pt II)-1962	Graphical symbols used in electro technology – Kind of current distribution systems and methods of connection (with amendment no. 1 and 2 (Reaffirmed 1985)
IS:2032-(pt III)-1962	Graphical symbols used in electro technology – Circuit elements and variability.
IS:2032-(pt V)-1965	Graphical symbols used in electro technology – generating elements and variability.
IS:2032-(pt VI)-1965	Graphical symbols used in electro technology – motor starters (with Amendment No. 1)
IS:2032-(pt VII)-1974	Graphical symbols used in electro technology – switchgear and auxiliaries (First revision)
IS:2032-(pt VIII)-1965	Graphical symbols used in electro technology – semiconductor devices Reaffirmed – 2001)
IS:2032 (pt 26)-1982	Graphical symbols used in electro technology – Rotating machines.
IS:2032 (pt 28)-1983	Graphical symbols used in electro technology – Transformer.
IS:2148-2004	Flameproof enclosures of electrical apparatus (3 rd revision)
IS:2667-1988	Fittings for rigid steel conduits for electrical wiring (First revision) with Amendment No. 1 and 2)
IS:3043-1987	Code of practice for earthing (with Amendment No. 1 to 5) (Re 2006)

I.S.No.	Title
IS:3419-1988	Fittings for rigid non-metallic conduits (First revision with Amendment No. 1 and 2) (Re 2001)
IS:3837-1988	Accessories for rigid steel conduits for electrical wiring (First revision)
IS:3854-1997	Switches for domestic and similar purpose (with Amendment No. 1 to 6) (Re 2002)
IS:4648-1968	Guide for electrical layout in residential buildings (with Amendment No. 1) (Re 1997)
IS:5133-1969	Steel and cast iron boxes (with Amendment No. 1 and 2) (part 1)
IS:5133-1969 (pt II)	Boxes made of insulating materials.
IS:8270-1976(pt I)	Guide for preparation of diagrams, charts and tables for electro technology-Definitions classifications. (Re 2004)
IS:9537-1981 (pt I)	Conduits for electrical installations-rigid steel conduits (with Amendment No. 1) (Re 2001)
IS : 9537-1983 (pt III)	Conduit for electrical installation Rigid steel conduits of insulating materials. (Re 2001) Tamil Nadu Building Practice-electrical Portion (Revised FN 1983). National Building Code of India, 1983.
IS:5613 (Part-1- Sec 1) – 1985	Code of practice for Design, Installation and Maintenance of overhead power lines. (Re 2002)
IS:2713-1980	Specifications for tubular steel poles for overhead power lines. (Re 1998)
IS:731-1971	Specifications for porcelain insulators for overhead power lines with a nominal voltage greater than 1000V. (Re 2001)
IS:5613 (Part-II Sec 1 & 2)-1985	Code of practice for design installation and maintenance of overhead power lines. (Re 2002)
IS 5613 (Part –II/Sec 1&2) 1985	Code of practice for design installation and maintenance of overhead Power lines.

Item No.	Item	Unit	Rate	Remarks
I – WIRING IN SURFACE RIGID STEEL CONDUIT SYSTEM				
3401	Point wiring for light point with 1.5 sq. mm PVC insulated cable with alluminum conductor of approved make in surface rigid steel conduit of suitable size including painting etc. as required as per specifications-			
	(a) Short point	each	205.00	
	(b) Medium point	each	371.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Long point	each	558.00	
	(d) Special point	each	748.00	
3402	Point wiring for fan/exhaust fan point with 1.5 sq. mm PVC insulated cable with aluminum conductor of approved make in surface rigid steel conduit of suitable size, including painting etc. as required as per specifications-			
	(a) Short point	each	221.00	
	(b) Medium point	each	391.00	
	(c) Long point	each	586.00	
	(d) Special point	each	782.00	
3403	Point wiring for 3 pin 5 Amps. Socket outlet point with 1.5 sq. mm PVC insulated cable with aluminum conductor of approved make in surface rigid steel conduit of suitable size, including painting etc. as required as per specifications on separate board-			
	(a) Short point	each	205.00	
	(b) Medium point	each	371.00	
	(c) Long point	each	558.00	
	(d) Special point	each	748.00	
3404	Point wiring for 3 pin 5 Amps. Socket outlet point with 1.5 sq. mm PVC insulated cable with aluminum conductor of approved make in surface rigid steel conduit of suitable size, with required materials as per specifications on same board.	each	54.00	
3405	Point wiring for call-bell/ buzzer point with 1.5 sq. mm PVC insulated cable with aluminum conductor of approved make in surface rigid steel conduit of suitable size including painting etc. as required as per specifications-			
	(a) Short point	each	205.00	
	(b) Medium point	each	371.00	
	(c) Long point	each	558.00	
	(d) Special point	each	748.00	

Item No.	Item	Unit	Rate	Remarks
3406	Point wiring for twin control light point with 1.5 sq. mm PVC insulated cable with alluminum conductor of approved make in surface rigid steel conduit of suitable size, including painting etc. as required as per specifications-			
	(a) Short point	each	261.00	
	(b) Medium point	each	374.00	
	(c) Long point	each	602.00	
	(d) Special point	each	787.00	
3407	Wiring for circuit wiring with PVC insulated cable with alluminum conductor of approved make in surface rigid steel conduit of suitable size, including painting etc. as required as per specifications-			
	(a) 2x1.5 sq. mm (1 circuit)	m	58.00	
	(b) 4x1.5 sq. mm (2 circuit)	m	74.00	
	(c) 6x1.5 sq. mm (3 circuit)	m	85.00	
	(d) 8x1.5 sq. mm (4 circuit)	m	96.00	
II – WIRING IN CONCEALED RIGID STEEL CONDUIT SYSTEM				
3408	Point wiring for light point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make, in concealed rigid steel conduit of suitable size, as required as per specifications -			
	(a) Short point	each	245.00	
	(b) Medium point	each	391.00	
	(c) Long point	each	578.00	
	(d) Special point	each	762.00	
3409	Point wiring for fan/exhaust fan point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid steel conduit of suitable size, as required as per specifications-			
	(a) Short point	each	261.00	
	(b) Medium point	each	411.00	
	(c) Long point	each	607.00	
	(d) Special point	each	802.00	

Item No.	Item	Unit	Rate	Remarks
3410	Point wiring for 3 pin 5 Amps. Socket outlet point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid steel conduit of suitable size as required as per specifications on separate board -			
	(a) Short point	each	245.00	
	(b) Medium point	each	391.00	
	(c) Long point	each	578.00	
	(d) Special point	each	762.00	
3411	Point wiring for 3 pin 5 Amps lockout outlet point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid steel conduit of suitable size as required as per specifications on same board-	each	54.00	
3412	Point wiring for Call-bell buzzer point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid steel conduit of suitable size, as required as required as per specifications-			
	(a) Short point	each	245.00	
	(b) Medium point	each	391.00	
	(c) Long point	each	578.00	
	(d) Special point	each	762.00	
3413	Point wiring for twin control light point with 1.5 sq. mm PVC insulated cable of approved make in concealed rigid steel conduit of suitable size, as required -			
	(a) Short point	each	301.00	
	(b) Medium point	each	434.00	
	(c) Long point	each	622.00	
	(d) Special point	each	808.00	
3414	Wiring for circuit wiring with 2x1.5 sq. mm PVC insulated cable of approved make in concealed rigid steel conduit of suitable size as required -			
	(a) 2x1.5 sq. mm	m	65.00	
	(b) 4x1.5 sq. mm	m	81.00	
	(c) 6x1.5 sq. mm	m	92.00	

Item No.	Item	Unit	Rate	Remarks
	(d) 8x1.5 sq. mm	m	103.00	
3415	Point wiring for light point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make, in surface rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	161.00	
	(b) Medium point	each	283.00	
	(c) Long point	each	411.00	
	(d) Special point	each	542.00	
3416	Point wiring for fan/exhaust fan point with 1.5 sq. mm PVC Insulated cable with aluminium conductor of approved make In surface rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	177.00	
	(b) Medium point	each	303.00	
	(c) Long point	each	440.00	
	(d) Special point	each	576.00	
3417	Point wiring for 3 pin 5 Amps. Socket outlet point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make In surface rigid (PVC) non-metallic conduit of suitable size as required as per specifications on separate board-			
	(a) Short point	each	266.00	
	(b) Medium point	each	283.00	
	(c) Long point	each	411.00	
	(d) Special point	each	542.00	
3418	Point wiring for 3 pin 5 Amps. Socket outlet point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make In surface rigid (PVC) non- metallic conduit of suitable size as required as per specifications on same board-	each	54.00	

Item No.	Item	Unit	Rate	Remarks
3419	Point wiring for call-bell/buzzer point with 1.5 Sq. mm PVC insulated cable with aluminium conductor of approved make in surface rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	161.00	
	(b) Medium point	each	283.00	
	(c) Long point	each	411.00	
	(d) Special point	each	542.00	
3420	Point wiring for twin control light point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in surface rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	217.00	
	(b) Medium point	each	326.00	
	(c) Long point	each	445.00	
	(d) Special point	each	582.00	
3421	Wiring for circuit wiring with PVC insulated cable with aluminium conductor of approved make in surface rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) 2x1.5 sq. mm (1 circuit)	m	43.00	
	(b) 4x1.5 sq. mm (2 circuit)	m	59.00	
	(c) 6x1.5 sq. mm (3 circuits)	m	70.00	
	(d) 8x1.5 sq. mm (4 circuits)	m	82.00	
III WIRING IN CONCEALED CONDUIT SYSTEM WITH RIGID (PVC.) NON-METALLIC CONDUIT				
3422	Point wiring for light point with 1.5 sq. mm PVC Insulated cable with aluminium conductor of approved make in concealed rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	201.00	
	(b) Medium point	each	303.00	
	(c) Long point	each	431.00	

Item No.	Item	Unit	Rate	Remarks
	(d) Special point	each	557.00	
3423	Point wiring for fan/exhaust fan point with 1.5 sq. mm PVC Insulated cable with aluminium conductor of approved make in concealed rigid. (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	217.00	
	(b) Medium point	each	323.00	
	(c) Long point	each	460.00	
	(d) Special point	each	596.00	
3424	Point wiring for 3 pin 5 Amps. socket outlet point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid (PVC) non-metallic conduit of suitable size as required as per specifications on separate board-			
	(a) Short point	each	201.00	
	(b) Medium point	each	303.00	
	(c) Long point	each	431.00	
	(d) Special point	each	557.00	
3425	Point wiring for 3 pin 5 Amps. socket outlet point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid (PVC) non-metallic conduit of suitable size with required materials as per specifications on same board.	each	54.00	
3426	Point wiring for call-bell/buzzer point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid (PVC) non-metallic conduit of suitable size as required as per specifications -			
	(a) Short point	each	201.00	
	(b) Medium point	each	303.00	
	(c) Long point	each	431.00	
	(d) Special point	each	557.00	

Item No.	Item	Unit	Rate	Remarks
3427	Point wiring for twin control light point with 1.5 sq. mm PVC insulated cable with aluminium conductor of approved make in concealed rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) Short point	each	257.00	
	(b) Medium point	each	346.00	
	(c) Long point	each	476.00	
	(d) Special point	each	602.00	
3428	Wiring for circuit wiring with PVC insulated cable with aluminium conductor of approved make in concealed rigid (PVC) non-metallic conduit of suitable size as required as per specifications-			
	(a) 2x1.5 sq. mm	m	50.00	
	(b) 4x15. sq. mm	m	66.00	
	(c) 6x1.5 sq. mm	m	77.00	
	(d) 8x1.5 sq. mm	m	89.00	
IV POWER WIRING IN RIGID STEEL CONDUIT				
3429	Point wiring for 3 pin 15 Amps. socket outlet point on separate board with 4 sq. mm PVC insulated cable with aluminium conductor, 15 Amps. PB. Switch etc. of approved make in suitable size of the rigid steel conduit including 6 sq. mm G.I. earth continuity conductor in surface conduit wiring system as per specifications-			
	(a) Short point	each	205.00	
	(b) Medium point	each	371.00	
	(c) Long point	each	558.00	
	(d) Special point	each	748.00	
3430	Point wiring for 3 pin 1.5 Amps socket outlet point on separate board with 4 sq. mm PVC insulated cable with aluminium conductor, 15 Amps. PB switch etc. of approved make in suitable size of rigid steel conduit including 6 sq. mm G.I. continuity conductor in concealed conduit wiring system as per specifications-			

Item No.	Item	Unit	Rate	Remarks
	(a) Short point	each	245.00	
	(b) Medium point	each	391.00	
	(c) Long point	each	578.00	
	(d) Special point	each	762.00	
3431	Point wiring for 3 pin 1.5 Amps. Socket outlet points on same board with 4 sq. mm PVC insulated cable with aluminium conductor 15 Amps. PB. Switch etc. of approved make in surface concealed rigid steel conduit of suitable size with required materials including 6 sq. mm G.I. earth continuity conductor as per specifications.	each	54.00	
V	MAINS AND SUB-MAINS			
3432	Wiring for sub-mains with PVC insulated cable with aluminium conductor of approved make in surfaced rigid steel conduit of suitable size including connections, painting etc. as required as per specifications-			
(A)	2 Wire Sub-mains-			
	(i) 2.5 sq. mm cable in 20 mm conduit	m	67.00	
	(ii) 4 sq. mm cable in 20 mm conduit	m	72.00	
	(iii) 6 sq. mm cable in 20 mm conduit	m	76.00	
	(iv) 10 sq. mm cable in 20 mm conduit	m	87.00	
	(v) 16 sq. mm cable in 25 mm conduit	m	111.00	
	(vi) 25 sq. mm cable in 32 mm conduit	m	147.00	
	(vii) 35 sq. mm cable in 32 mm conduit	m	159.00	
	(viii) 50 sq. mm cable in 40 mm conduit	m	186.00	
(B)	3 Wire Sub-mains-			
	(i) 2.5 sq. mm cable in 20 mm conduit	m	74.00	
	(ii) 4 sq. mm cable in 20 mm conduit	m	81.00	
	(iii) 6 sq. mm cable in 20 mm conduit	m	87.00	
	(iv) 10 so. Mm cable in 25 mm conduit	m	108.00	
	(v) 16 sq. mm cable in 32 mm conduit	m	136.00	
	(vi) 25 sq. mm cable in 40 mm conduit	m	196.00	
	(vii) 35 sq. mm cable in 40 mm conduit	m	213.00	
	(viii) 50 sq. mm cable in 50 mm conduit	m	248.00	

Item No.	Item	Unit	Rate	Remarks
(C)	4 Wire Sub-mains-			
	(i) 2.5 sq. mm cable in 20 mm conduit	m	81.00	
	(ii) 4 sq. mm cable in 20 mm conduit	m	90.00	
	(iii) 6 sq. mm cable in 25 mm conduit	m	102.00	
	(iv) 10 sq. mm cable in 25 mm conduit	m	125.00	
	(v) 16 sq. mm cable in 32 mm conduit	m	159.00	
	(vi) 25 sq. mm cable in 40 mm conduit	m	236.00	
	(vii) 35 sq. mm cable in 40 mm conduit	m	258.00	
	(viii) 50 sq. mm cable in 50 mm conduit	m	302.00	
3433	Wiring for sub-mains with PVC insulated cable with aluminium conductor of approved make in recessed (concealed) rigid steel conduit of suitable size including connections painting etc. as required as per specifications.			
(A)	2 Wire Sub-mains-			
	(i) 2.5 sq. mm cable in 20 mm conduit	m	74.00	
	(ii) 4 sq. mm cable in 20 mm conduit	m	79.00	
	(iii) 6 sq. mm cable in 20 mm conduit	m	83.00	
	(iv) 10 sq. mm cable in 20 mm conduit	m	94.00	
	(v) 16 sq. mm cable in 25 mm conduit	m	118.00	
	(vi) 25 sq. mm cable in 32 mm conduit	m	154.00	
	(vii) 35 sq. mm cable in 32 mm conduit	m	166.00	
	(viii) 50 sq. mm cable in 40 mm conduit	m	193.00	
(B)	3 Wire Sub-mains-			
	(i) 2.5 sq. mm cable in 20 mm conduit	m	81.00	
	(ii) 4 sq. mm cable in 20 mm conduit	m	88.00	
	(iii) 6 sq. mm cable in 20 mm conduit	m	94.00	
	(iv) 10 sq. mm cable in 25 mm conduit	m	115.00	
	(v) 16 sq. mm cable in 32 mm conduit	m	143.00	
	(vi) 25 sq. mm cable in 40 mm conduit	m	203.00	
	(vii) 35 sq. mm cable in 40 mm conduit	m	220.00	
	(viii) 50 sq. mm cable in 50 mm conduit	m	255.00	
(C)	4 Wire Sub-mains-			
	(i) 2.5 sq. mm cable in 20 mm conduit	m	88.00	
	(ii) 4 sq. mm cable in 20 mm conduit	m	97.00	

Item No.	Item	Unit	Rate	Remarks
	(iii) 6 sq. mm cable in 25 mm conduit	m	109.00	
	(iv) 10 sq. mm cable in 25 mm conduit	m	132.00	
	(v) 16 sq. mm cable in 32 mm conduit	m	166.00	
	(vi) 25 sq. mm cable in 40 mm conduit	m	243.00	
	(vii) 35 sq. mm cable in 40 mm conduit	m	265.00	
	(viii) 50 sq. mm cable in 50 mm conduit	m	309.00	
VI.	CABLES, CONDUITS, CAING, ETC.			
3434	Supplying and drawing single core PVC Insulated cable of approved make in existing rigid steel conduit. (Surface or concealed) as per specifications-			
(a)	(i) 2x2.5 sq. mm	m	20.00	
	(ii) 3x2.5 sq. mm	m	27.00	
	(iii) 4x2.5 sq. mm	m	34.00	
(b)	(i) 2x4 sq. mm	m	25.00	
	(ii) 3x4 sq. mm	m	34.00	
	(iii) 4x4 sq. mm	m	43.00	
(c)	(i) 2x6 sq. mm	m	29.00	
	(ii) 3x6 sq. mm	m	40.00	
	(iii) 4x6 sq. mm	m	52.00	
(d)	(i) 2x10 sq. mm	m	40.00	
	(ii) 3x10 sq. mm	m	57.00	
	(iii) 4x10 sq. mm	m	74.00	
(e)	(i) 2x16 sq. mm	m	58.00	
	(ii) 3x16 sq. mm	m	81.00	
	(iii) 4x16 sq. mm	m	104.00	
(f)	(i) 2x25 sq. mm	m	92.00	
	(ii) 3x25 sq. mm	m	132.00	
	(iii) 4x25 sq. mm	m	171.00	
(g)	(i) 2x35 sq. mm	m	104.00	
	(ii) 3x35 sq. mm	m	149.00	
	(iii) 4x35 sq. mm	m	194.00	
(h)	(i) 2x50 sq. mm	m	128.00	
	(ii) 3x50 sq. mm	m	182.00	
	(iii) 4x50 sq. mm	m	237.00	

Item No.	Item	Unit	Rate	Remarks
3335	Supplying and drawing single core PVC insulated weather proof cable of approved make in existing rigid steel conduit (surface or concealed) as per specifications-			
	(i) 2x2.5 sq. mm	m	31.00	
	(ii) 2x4 sq. mm	m	29.00	
	(iii) 2x6 sq. mm	m	47.00	
	(iv) 2x10 sq. mm	m	54.00	
3436	Supplying and drawing 1.5 sq. mm cable of approved make in existing conduit /casing/batten as per specifications-			
	(i) PVC Insulated Cable	m	16.00	
	(ii) PVC Sheathed Cable	m	20.00	
3437	Supplying and fixing as per specification rigid steel conduit of approved make in surface (open) conduit wiring system with iron screws, check nuts, saddles, bends, toes etc. including painting as required -			
	(a) 20 mm conduit	m	54.00	
	(b) 25 mm conduit	m	57.00	
	(c) 32 mm conduit	m	61.00	
	(d) 40 mm conduit	m	70.00	
	(e) 50 mm conduit	m	78.00	
3438	Supplying and fixing as per specification rigid steel conduit of approved make in recessed (concealed) conduit wiring system with iron screws, check nuts, saddles bends, toes etc. are required			
	(a) 20 mm conduit	m	60.00	
	(b) 25 mm conduit	m	64.00	
	(c) 32 mm conduit	m	68.00	
	(d) 40 mm conduit	m	77.00	
	(e) 50 mm conduit	m	85.00	
3439	Supplying and fixing as per specification 20 mm. rigid non-metallic (PVC) conduit of approved make complete in surface wiring system.	m	39.00	

Item No.	Item	Unit	Rate	Remarks
3440	Supplying and fixing as per specification 20 mm rigid non-metallic (PVC) conduit of approved make complete in concealed wiring system.	m	46.00	
VII- UNDER GROUND CABLES				
3441	Supplying of PVC insulated heavy duty cables (conforming to I.S. 1554.1964) 650/1100 volts, grade 2 core, armoured of approved make -			
	(i) 4 sq. mm	m	85.00	
	(ii) 6 sq. mm	m	113.00	
	(iii) 10 sq. mm	m	158.00	
3442	Supplying of PVC insulated heavy duty cables (conforming to I.S. 1554.1964) 650/1100 volts, grade 2 core, armoured of approved make -			
	(i) 6 sq. mm	m	85.00	
	(ii) 10 sq. mm	m	119.00	
3443	Supplying of PVC insulated heavy duty cables (conforming to I.S. 1554.1964) 1100 volts, grade 3½ core, armoured of approved make -			
	(i) 25 sq. mm	m	271.00	
	(ii) 35 sq. mm	m	314.00	
	(iii) 50 sq. mm	m	408.00	
	(iv) 70 sq. mm	m	530.00	
	(v) 95 sq. mm	m	687.00	
	(vi) 120 sq. mm	m	840.00	
	(vii) 150 sq. mm	m	992.00	
	(viii) 185 sq. mm	m	1242.00	
	(ix) 240 sq. mm	m	1588.00	
	(x) 300 sq. mm	m	1929.00	
	(xi) 400 sq. mm	m	3103.00	
3444	Supplying of PVC insulated heavy duty power cables (conforming to I.S. 1554.1964) 1100 volts, grade 3½ core, unarmoured of approved make -			
	(i) 25 sq. mm	m	227.00	
	(ii) 35 sq. mm	m	276.00	

Item No.	Item	Unit	Rate	Remarks
	(iii) 50 sq. mm	m	363.00	
	(iv) 70 sq. mm	m	486.00	
	(v) 95 sq. mm	m	642.00	
	(vi) 120 sq. mm	m	784.00	
	(vii) 150 sq. mm	m	922.00	
	(viii) 185 sq. mm	m	1161.00	
	(ix) 240 sq. mm	m	1531.00	
	(x) 300 sq. mm	m	1855.00	
	(xi) 400 sq. mm	m	2340.00	
3445	Laying of underground cable armoured / unarmoured in existing prepared trench as per specification - labour only -			
	(i) 2 core cable up to 10 sq. mm	m	20.00	
	(ii) 3½ core cable 16 sq. mm to 120 sq. mm	m	40.00	
	(iii) 3½ core cable 150 sq. mm and above.	m	60.00	
3446	Supplying and laying of cement concrete of approved type of cover over L.T. cable in trench as per specifications.	m	60.00	
3447	Laying of underground cable armoured/ unarmoured in existing G.I. pipe/RCC /Stone ware or any other pipe, etc. as required labour only -			
	(i) 2 core cable up to 10 sq. mm	m	14.00	
	(ii) 3½ core cable 16 sq. mm to 120 sq. mm	m	33.00	
	(iii) 3½ core cable 150 sq. mm and above.	m	53.00	
3448	Laying of underground cable armoured/ unarmoured as per specification in air with approved type of iron clamps, complete -			
	(i) 2 core cable up to 10 sq. mm	m	33.00	
	(ii) 3½ core cable 16 sq. mm to 120 sq. mm	m	53.00	
	(iii) 3½ core cable 150 sq. mm and above.	m	93.00	

Item No.	Item	Unit	Rate	Remarks
3449	Supplying and fixing indoor type cable end box with glands suitable for 2 core PVC insulated heavy duty cable duly installed including making joints, connections, testing, etc. complete as required up to 10 sq. mm cable.	each	221.00	
3450	Supplying and fixing indoor type cable end box with glands suitable for 3½ core PVC insulated heavy duty cable duly installed including making joints, connections, testing, etc. complete as required -			
	(i) Up to 50 sq. mm cable	each	387.00	
	(ii) From 70 sq. mm to 185 sq. mm cable.	each	706.00	
	(iii) 240 sq. mm and above.	each	1254.00	
3451	Supplying and fixing outdoor type cable end box with glands, suitable for 2 core PVC insulated heavy duty cable duly installed including making joint, connections, filling in with cable compound, testing etc. complete as required up to 10 Sq. mm cable.	each	402.00	
3452	Supplying and fixing out door type cable end box with glands, suitable for 3½ core PVC insulated heavy duty cable duly installed including making joints, connections, filling in with cable compound testing, etc. complete as required -			
	(i) Up to 50 sq. mm cable	each	584.00	
	(ii) From 70 sq. mm to 185 sq. mm cable.	each	988.00	
	(iii) 240 sq. mm and above.	each	1763.00	
3453	Supplying and installing G.I. protective pipe for underground cable fixed on wall/pole with necessary iron clamps or laid in ground, etc. in an approved manner as required complete -			
	(a) 101.6 mm G.I. pipe	m	879.00	
	(b) 50.8 mm G.I. pipe	m	402.00	

Item No.	Item	Unit	Rate	Remarks
3454	Supplying and fixing 'T' joint box with glands, suitable for 2 core PVC insulated heavy duty cables duly installed including making joints, connections, filling in with cable compound, testing etc. complete as required - Up to 10 sq. mm cable	each	967.00	
3455	Supplying and fixing 'T' joint box with glands, suitable for 3½ core PVC insulated heavy duty cables duly installed including making joints, connections, filling in with cable compound, testing etc. complete as required - (i) Up to 50 sq. mm cable (ii) From 70 sq. mm to 185 sq. mm cable (iii) 240 sq. mm and above	each each each	1390.00 2407.00 3774.00	
3456	Supplying and fixing straight joint box with glands, suitable for 2 core PVC insulated heavy duty cables duly installed including making joints, connections, filling in with cable compound, testing etc. complete as required - Up to 10 sq. mm cable	each	650.00	
3457	Supplying and fixing straight joint box with glands, suitable for 3½ core PVC insulated heavy duty cable duly installed including making joints, connections, filling in with cable compound, testing etc. complete as required- (i) Up to 50 sq. mm cable (ii) From 70 sq. mm to 185 sq. mm cable (iii) 240 sq. mm and above	each each each	938.00 1559.00 2644.00	

VIII – REWIRING OF LIGHT/FAN POINTS

3458	Rewiring of point wiring in existing surface rigid steel/(PVC) non-metallic conduit with 1.5 sq. mm PVC insulated cable with aluminum conductor of approved make and other materials as required including replacement of wornout/damaged/missing materials painting etc. complete as per specification. This shall include all work, arrangement required for point wiring but shall exclude switch ceiling rose, fittings –			
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Item No.	Item	Unit	Rate	Remarks
	(A) Light/Fan/3 Pin 5 Amps. Socket outlet on separate board/call-bell/buzzer point/			
	(a) Short point	each	81.00	
	(b) Medium point	each	122.00	
	(c) Long point	each	176.00	
	(d) Special point Twin control light point -	each	267.00	
	(B) Twin control light point			
	(a) Short point	each	97.00	
	(b) Medium point	each	125.00	
	(c) Long point	each	221.00	
	(d) Special point Twin control light point -	each	293.00	
	(C) Circuit wiring 2x1.5 sq. mm	m	30.00	
	(D) 3 pin 5 Amps socket outlet point on same board.	each	54.00	
3459	Supplying of PVC insulated submersible cable 3 core flat copper			
	(a) Deluxe(outer colour-bright black)			
	(i) 4 sq. mm	m	85.00	
	(ii) 6 sq. mm	m	128.00	
	(b) Premium(outer colour-bright matt finish black with yellow line)			
	(i) 4 sq. mm	m	112.00	
	(ii) 6 sq. mm	m	168.00	

CHAPTER – 35 ELECTRICAL WORK ACCESSORIES, SWITCHES, DISTRIBUTION, FUSE BOARDS AND BUS BAR CHAMBERS

Notes :-

1. Rates include all lead and lift, for all materials, for all items, unless otherwise specified.
2. Description and Enumeration of fittings :-
 - A.1 Ordinary Pendants
 - A. 1.1 Ordinary Pendants shall be described as including.
 - (a) Lamp holders, and
 - (b) Required length of flexible cord.
 - A.2. Rise and fall pendants.
 - A.2.1 Rise and fall pendants shall be described as including
 - (a) Lamp holder,
 - (b) Counter weight with lead shots up to 1.25 kg. And pulley cord.
 - (c) Required length of flexible twin, and
 - (d) Pulley cord, guide and ceiling ring.
 - A.3. Stiff pendants.
 - A.3.1. Stiff pendants shall be described as including –
 - (a) Back plate.
 - (b) Required length of conduit,
 - (c) Adapter, and
 - (d) Lamp holder,
 - A.4. Stiff watertight pendants.
 - A.4.1. Stiff watertight pendants shall be described as including –
 - (a) Back – plate,
 - (b) Required length of conduit,
 - (c) Gallery,
 - (d) Reflector,
 - (e) Well-glass screw guard fitting,
 - (f) Rubber washers, and
 - (g) Lamp holder
 - A.5. Plain Brackets.
 - A.5.1. Plain brackets shall be described as including –

- (a) Back-plate,
- (B) Tubbling with nozzle, and
- (c) Lamp holder,

A.6. Water tight Brackets,

A.6.1 Water tight brackets shall be described as including-

- (a) Back-plate,
- (b) Conduit,
- (c) Gallery,
- (d) Reflector,
- (e) Well glass screw guard fitting,
- (f) Lamp holder, and
- (g) Rubber washers.

A.7. Shades,

A.7.1. Shades shall be described stating the diameter and type.

A.8. Switches,

A.8.1. When measured separately from point wiring, the switches shall be described stating the type and rated capacity. Cover plates, if any, shall be included with the item.

A.8.2. Switch plug combination, comprising socket outlet, switch and plug shall be described, and the type and rated capacity shall be stated.

A.9. Bulk-Head fittings,

A.9.1. Bulk-head fittings shall be described as including-

- (a) Lamp holder (all insulated)
- (b) Reflector,
- (c) Water tight glass front, hinged and with wing nuts, and
- (d) Wire guard.

A.10. Lamps,

A.10.1. Lamps shall be described stating the type, wattage and voltage.

A.11. Fluorescent-Lamp fittings,

A.11.1. Fluorescent-Lamp fittings shall be described as including-

- (a) Single tube or twin tube (stating the type and length),
- (b) Choke (ballast),

- (c) Capacitor,
- (d) Starter,
- (e) Lamp holders,
- (f) Starter-holders,
- (g) Reflector,
- (h) Back-plate,
- (i) Inter-connecting wiring,
- (j) Make and type of fitting, and
- (k) Louver or perplex panel.

A.12. Meters and meter boards,

A.12.1. Meters and meter boards shall be enumerated and described stating the rated capacity and method of fixing.

A.13. Ceiling fans and Regulators,

A.13.1. Ceiling fans and regulators shall be enumerated separately and fully described.

A.13.1.1. Painting-Painting of ceiling fans, where required to be done, shall be described as enumerated.

3. The provisions of scaffolding or ladder or any tools and plants required shall be deemed to be included in the items, unless otherwise stated.

4. Cutting through walls and floors, lifting up floor boards and refixing, cutting out plaster and making good all the work disturbed, notching or drilling holes through joists, etc. shall be deemed to be included with the item of work :-

Item No.	Item	Unit	Rate	Remarks
3501	Supplying and fixing as per specification brass pendant holder of approved make including flexible cord up to 3-m length with necessary materials complete.	each	35.00	
3502	Supplying and fixing as per specification brass batten holder/angle batten holder of approved make with necessary materials complete.	each	30.00	
3503	Supplying and fixing as per specification shade of approved make with necessary materials complete-			
	(a) Enamel iron shade 250x125 mm	each	70.00	
	(b) Langham shade glass 250x125 mm	each	75.00	
	(c) Langham shade Alkathine 210 mm	each	58.00	

Item No.	Item	Unit	Rate	Remarks
	(d) Double cone reflector.	each	92.00	
	(e) Paw shade 125 mm	each	47.00	
3504	Supplying and fixing as per specification water tight bracket complete with armature, well glass, shade and brass holder, etc. with necessary materials.	each	109.00	
3505	Supplying and fixing as per specification Bulk head fittings of approved make suitable for 100 watt lamp with necessary materials complete-			
	(a) Ordinary	each	131.00	
	(b) Deluxe	each	188.00	
3506	Supplying and fixing as per specification stiff pendants of approved make with chromium plated conduit up to one fictie brass holder, adopter, back-plate, etc. complete.	each	143.00	
3507	Supplying and fixing as per specification pendants, rise and fall, of approved make including lamp holder, counter weight with lead shots up to 1.25 kg pulley cord, flexible cord up to 6m length, pulley cord guide and ceiling ring etc. complete.	each	240.00	
3508	Supplying and fixing as per specification call bell/buzzer of approved make with necessary materials complete-			
	(a) 230 volts A.C. Ordinary	each	98.00	
	(b) 230 volts A.C. Deluxe	each	171.00	
3509	Supplying and fixing as per specification call bell indicators 230 volts A.C. of approved make with necessary materials complete-			
	(a) With 4 way indicator	each	953.00	
	(b) With 6 way indicator	each	1405.00	
	(c) With 8 way indicator	each	1863.00	
3510	Supplying and fixing flexible cords of approved make-			
	(a) PVC insulated PVC sheathed round flexible 16/0.020 mm three core.	m	34.00	
	(b) PVC insulated PVC sheathed round flexible 24/0.020 mm three core.	m	42.00	

Item No.	Item	Unit	Rate	Remarks
3511	Supplying and fixing in position incandescent lamp of approved make –			
	a. 15 watt 250 volts	each	24.00	
	b. 25 watt 250 volts	each	24.00	
	c. 40 watt 250 volts	each	24.00	
	d. 60 watt 250 volts	each	24.00	
	e. 75 watt 250 volts	each	24.00	
	f. 100 watt 250 volts	each	24.00	
	g. 0/5 watt night lamp	each	24.00	
	h. 15 watt 250 volts coloured lamp	each	24.00	
3512	Supplying and fixing as per specification socket outlets PB of approved make with necessary materials complete-			
	(a) 5 Amps 250 volts 3 pin ordinary	each	33.00	
	(b) 5 Amps 250 volts 3 pin flush type	each	33.00	
	(c) 15 Amps 250 volts 3 pin ordinary	each	50.00	
	(d) 15 Amps 250 volts 3 pin flush type	each	61.00	
3513	Supplying of approved make plugs (top)			
	(a) 5 Amps 250 volts 3 pin ordinary	each	17.00	
	(b) 5 Amps 250 volts 3 pin deluxe	each	23.00	
	(c) 15 Amps 250 volts 3 pin ordinary	each	28.00	
	(e) 15 Amps 250 volts 3 pin deluxe.	each	40.00	
3514	Supplying and fixing as per specification ball sockets of approved make with necessary materials complete-	each	28.00	
3515	Supplying and fixing as per specification round globe 225 mm with bakelite gallery of approved make with necessary materials complete-	each	34.00	
3516	Supplying and fixing as per specification danger/caution board of approved make with necessary materials complete-			
	Small size	each	41.00	
	Large size	each	58.00	
3517	Supplying and fixing as per specification ceiling rose porcelain base 3 plate of approved make with necessary materials complete-	each	52.00	

Item No.	Item	Unit	Rate	Remarks
II- IRON CLAD/METAL CLAD SWITCHES AND SWITCH FUSES UNIT				
3518	Supplying of approved make iron clad/metal clad double pole switch fuses (conduit entry)-			
	(I) 16 Amps 250 volts	each	249.00	
	(II) 32 Amps 250 volts	each	585.00	
3519	Supplying of approved make iron clad/metal clad switch fuse, front operated totally enclosed pattern (suitable for main switch as well as controlling switch for appliances) single pole.	each	226.00	
3520	Supplying of approved make iron clad/metal clad triple pole and neutral switch fuses for main switch fuses (conduit entry)-			
	(a) 16 Amps 415/1500 volts	each	746.00	
	(b) 32 Amps 415/1500 volts	each	870.00	
	(c) 63 Amps 415/1500 volts	each	2263.00	
	(d) 100 Amps 415/1500 volts	each	3496.00	
	(e) 200 Amps 415/1500 volts	each	6992.00	
3521	Supplying of approved make iron clad/metal clad triple pole switch fuses for main switch fuses (conduit entry)-			
	a. 16 Amps 415/1500 volts	each	661.00	
	b. 32 Amps 415/1500 volts	each	774.00	
	c. 63 Amps 415/1500 volts	each	2011.00	
	d. 100 Amps 415/1500 volts	each	3108.00	
	e. 200 Amps 415/1500 volts	each	6215.00	
3522	Supplying of approved make iron clad/metal clad triple pole switch fuses (conduit entry)-			
	(a) 63 Amps 415/1500 volts	each	5813.00	
	(b) 100 Amps 415/1500 volts	each	8077.00	
	(c) 200 Amps 415/500 volts	each	11395.00	
	(d) 300 Amps 415/500 volts	each	14884.00	
	(e) 400 Amps 415/500 volts	each	22642.00	
	(f) 500 Amps 415/500 volts	each	33089.00	
	(g) 600 Amps 415/500 volts	each	35595.00	

Item No.	Item	Unit	Rate	Remarks
3523	Supplying of approved make iron clad/metal clad triple pole neutral switch fuses with H.R.C. fuses -			
	(a) 63 Amps 415/1500 volts	each	5560.00	
	(b) 100 Amps 415/1500 volts	each	7494.00	
	(c) 200 Amps 415/500 volts	each	10582.00	
	(d) 300 Amps 415/500 volts	each	13683.00	
	(e) 400 Amps 415/500 volts	each	20228.00	
	(f) 500 Amps 415/500 volts	each	33088.00	
	(g) 600 Amps 415/500 volts	each	34324.00	
3524	Supplying of approved make iron clad/metal clad triple pole neutral (four pole) change over switches-			
	(a) 63 Amps 415/500 volts	each	5297.00	
	(b) 100 Amps 415/500 volts	each	10720.00	
	(c) 200 Amps 415/500 volts	each	15217.00	
	(d) 300 Amps 415/500 volts	each	19347.00	
	(e) 400 Amps 415/500 volts	each	25434.0	
	(f) 500 Amps 415/500 volts	each	29198.00	
	(g) 630 Amps 415/500 volts	each	38934.00	
III METAL CLAD DISTRIBUTION FUSE BOARDS AND BUS BAR CHAMBERS.				
3525	Supplying of approved make distribution fuse boards, single pole and neutral 15/16 Amps 250 volts per way –			
	i. 2 way	each	192.00	
	ii. 4 way	each	283.00	
	iii. 6 way	each	339.00	
	iv. 8 way	each	407.00	
3526	Supplying of approved make of distribution fuse boards, triple pole and neutral.			
	(a) 15/16 Amps 250/415/500 Volts			
	i. 2 way per pole	each	1356.00	
	ii. 3 way per pole	each	1808.00	
	iii. 4 way per pole	each	2147.00	
	iv. 6 way per pole	each	2825.00	

Item No.	Item	Unit	Rate	Remarks
	(b) 30/32 Amps 250/415/500 Volts-			
	i. 4 way per pole	each	2825.00	
	ii. 6 way per pole	each	3277.00	
3527	Supplying of iron clad/metal clad approved make bus-bar chambers with aluminum/tinned copper bus bar as per specification complete with hinged Metallised cover-			
	(a) 500 Volts 30/32 Amps-			
	(i) 3 way	each	904.00 .	
	(ii) 4 way	each	1243.00	
	(b) 500 volts 60/63 Amps-			
	(i) 3 way	each	1130.00	
	(ii) 4 way	each	1582.00	
	(c) 500 volts 100 Amps			
	(i) 3 way	each	1356.00	
	(ii) 4 way	each	2034.00	
	(d) 500 volts 200 Amps-			
	(i) 3 way	each	2486.00	
	(ii) 4 way	each	2938.00	
3528	Supplying and fixing in position compact fluorescent lamp (C.F.L) of approved make			
	(i) 5 or 8 watt	each	113.00	
	(ii) 11 watt	each	141.00	
	(iii) 15 watt	each	158.00	
	(iv) 20 watt	each	192.00	
	(v) 25 watt	each	311.00	

CHAPTER 36 - ELECTRICAL WORK-FIXING OF I.C. SWITCH FUSES/DISTRIBUTION BOARD/MINIATURE CIRCUIT BREAKERS

Notes :-

1. Rates include all lead and lift, for all materials, for all items unless otherwise specified.
2. The provision of scaffolding or ladder or any tools and plants required shall be deemed to be included in the items, unless otherwise stated.
3. Excavation for poles, underground cables, concreting in foundations, painting of poles, struts, etc. shall be measured separately
4. Cutting through walls and floors, lifting up floor boards and refixing, cutting out plaster and making good all the work disturbed, notching or drilling holes through joints, etc. shall be deemed to be included with the item of work.
5. Open recessed and closed recessed boards shall be measured separately. Where the boards are hinged instead of the normal fixing with screws, they shall be measured separately stating the size and number of hinges.

FIXING OF I.C. SWITCH FUSES/DISTRIBUTION BOARDS

Item No.	Item	Unit	Rate	Remarks
A-BOXES AND CHANGE OVER SWITCHES				
3601	Fixing of metal clad/iron clad switches on 25x5 mm flat iron clamps including supplying and fixing of clamps as required duly embedded in masonry including cable connection and other required materials as per specification.			
	(a) 15/16 Amp SP/DP switch	each	106.00	
	(b) 30/32 Amp DP switch or 15/16 Amp TP or TP & N switch	each	117.00	
	(c) 30/32 Amp TP or TP & switch	each	129.00	
3602	Fixing of metal clad/iron clad switches on 25x25x5 mm angle iron clamps including supplying and fixing of clamps as required duly embedded in masonry including cable connection and other required materials as per specification.			
	(a) 60/63 Amp TP or TP & N or 60/63 Amp change over switch	each	174.00	
	(b) 100 Amp TP or TP & N or 100 Amp change over switch	each	244.00	
	(c) 200 Amp TP or TP & N or 200 Amp change over switch.	each	325.00	

Item No.	Item	Unit	Rate	Remarks
3603	Fixing of metal clad/iron clad switches on 35x35x5 mm angle iron clamps including supply and fixing of clamps as required duly embedded in masonry including cable connection and other required materials as per specification.			
	(a) 300 Amp TP or TP & N or 300 Amp change over switch	each	438.00	
	(b) 400 Amp TP or TP & N or 400 Amp change over switch	each	551.00	
	(c) 500 Amp TP or TP & N or 500 Amp change over switch	each	608.00	
	(d) 600 Amp TP or TP & N or 600 Amp change over switch	each	664.00	
3604	Fixing of metal clad/distribution boards on 25x5 mm flat iron clamps including supplying and fixing of clamps as required duly embedded in masonry including cable connection and other required materials as per specification.			
	"A" Single pole and Neutral DB.			
	(a) Up to 4 ways DBS	each	84.00	
	(b) Up to 8 ways DBS	each	95.00	
	"B" Triple pole and Neutral DB 15/16 Amp/way/415/500 Volts.			
	(a) Up to 3 ways per pole	each	112.00	
	(b) Up to 8 ways per pole	each	129.00	
3605	Fixing of metal clad DB415/500 Volts on 25x25x5 mm angle iron clamps including supplying and fixing of clamps as required duly embedded in masonry, cable connection and other required materials as per specification.			
	(a) 32 Amps. 415/500 volt TP & N distribution board –			
	(i) Up to 6 ways per pole	each	174.00	
3606	Fixing of metal clad/iron clad bus bar chamber including fixing on required size flat iron/angle iron clamps, cable connections and other required materials as per specification.			

Item No.	Item	Unit	Rate	Remarks
	(A) On 25x5 mm flat iron clamp duly embedded in masonry –			
	(i) 30/32 Amp. 415/500 volt, 3 ways bus bar	each	117.00	
	(ii) 30/32 Amp. 415/500 volt, 4 ways bus bar	each	129.00	
	(B) On 25x25x5 mm angle iron clamp duly embedded in masonry			
	(i) 60/63 Amp 415/500 volt, 3 ways	each	210.00	
	(ii) 60/63 Amp. 415/500 volt, 4 ways	each	221.00	
	(C) On 35x35x5 mm angle iron clamp duly embedded in masonry			
	(i) 100 Amp. 415/500 volt 3 ways.	each	346.00	
	(ii) 100 Amp. 415/500 volt 4 ways.	each	380.00	
	(iii) 200 Amp. 415/500 volt 3 ways.	each	416.00	
	(iv) 200 Amp. 415/500 volt 4 ways.	each	438.00	
3607	Fixing of M.C.B. in sheet steel enclosures, as required as per accepted practice, including mounting on bus bar and cable connections etc. complete (Labour only).	each	27.00	
3608	Labour charges for fixing sheet steel enclosures surface M.C.B.D.B. surface mounting type, as per accepted practice on 25x5 mm flat iron clamp duly embedded in wall, cable connection complete-			
	(i) For item 3612 (i)	each	80.00	
	(ii) For item 3612 (ii)	each	101.00	
	(iii) For item 3612 (iii) & (iv)	each	121.00	
3609	Labour charges for fixing sheet steel enclosures M.C.B.D.B. surface mounting type, as per accepted practice on 25x25x5 mm flat iron clamps including supplying and fixing of clamps duly embedded in wall, cable connection complete-			
	(i) For item 3613 (i), (ii), (iii) & (iv)	each	101.00	

Item No.	Item	Unit	Rate	Remarks
3610	Labour charges for fixing sheet steel enclosures M.C.B.D.B. flush mounting type, as per accepted practice duly holed in end plate, completely flushed in wall, cable connection etc. complete-			
	(i) For item 3612 (i), (ii), (iii) & (iv)	each	101.00	
	(ii) For item 3613 (i), (ii) & (iii)	each	121.00	
3611	Miniature circuit breakers Supplying of approved make and accepted standard miniature circuit breakers, suitable for 240/415 volts 50 cycle, A.C. supply but without enclosures -			
	“A”-single Pole			
	(i) 0.5 Amp. To 4 Amp. rating	each	232.00	
	(ii) 6 Amp. to 16 Amp. rating	each	181.00	
	(iii) 20 Amp. to 60 amp. rating	each	346.00	
	“B”-Single Pole & Neutral			
	(i) 6 Amp. to 16 Amp. rating	each	409.00	
	(ii) 20 Amp. to 60 amp. rating	each	596.00	
	“C” – Triple pole			
	(i) 6 Amp. to 16 Amp. rating	each	831.00	
	(ii) 20 Amp. to 60 amp. rating	each	1046.00	
	“D” – Triple Pole & Neutral			
	(i) 6 Amp. to 16 Amp. rating	each	863.00	
	(ii) 20 Amp. to 60 amp. rating	each	1244.00	
3612	Supplying of approved make and accepted standard sheet steel enclosures (dust protected) for SP & N distribution 'boards, including bus bar, neutral link, din bar suitable for incorporating M.C.B. surface/flush mounting type -'			
	(i) Up to 4 M.C. Bs per pole	each	735.00	
	(ii) From 6 to 8 M.C. Bs per pole	each	848.00	
	(iii) From 9 to 12 M.C. Bs per pole	each	1017.00	
	(iv) From 13 to 16 M.C. Bs per pole	each	1130.00	

Item No.	Item	Unit	Rate	Remarks
3613	Supplying of approved make and accepted standard sheet steel enclosures (dust protected) for TP & N distribution 'boards, including bus bar, neutral link, din bar suitable for incorporating M.C.B. surface/flush mounting type -'			
	(i) Up to 4 M.C. Bs per pole	each	2034.00	
	(ii) Up to 6 M.C. Bs per pole	each	2938.00	
	(iii) Up to 12 M.C. Bs. per pole	each	3842.00	
3614	Supplying of approved make and accepted standard sheet steel enclosures (dust protected) for TP & N distribution 'boards, including bus bar, neutral link, din bar suitable for incorporating one TP & N M.C.B. for incoming and SP M.C.B. for out-going as follows, surface/flush mounting type -'			
	(i) 4 M.C. Bs per pole	each	2260.00	
	(ii) 8 M.C. Bs per pole	each	2938.00	
	(iii) 12 M.C. Bs. per pole	each	3842.00	

CHAPTER 37 – ELECTRICAL WORK – EARTHING AND LIGHTENING CONDUCTOR, EXTERNAL ELECTRIFICATION AND OVERHEAD LINES

Notes:-

1, General –

- (a) Rates include all lead and lift, for all materials, for all items, unless otherwise specified.
- (b) The Provision of scaffolding or ladder or any tools and plants required shall be deemed to be included in the items, unless otherwise stated.
- (c) Excavation for poles, underground cables concreting in foundation, painting of poles, struts, etc. shall be measured separately.
- (d) Cutting through walls and floors, lifting up floor boards and refixing, cutting out plaster and making good all the work disturbed, notching or drilling holes through joists, etc. shall be deemed to be included with the item of work.

2. Overhead Lines –

- (a) Poles-Poles and struts for overhead lines shall be enumerated and described stating the type, material and size, that is, diameter at top and bottom (if round or tapering) and the total length.
- (b) The strength of the poles, if necessary, may also be stated.
- (c) Erection of poles shall be enumerated describing the type of foundation, size of the cement concrete collar at the base, etc.
- (d) Overhead line conductors- The length of overhead line conductors shall be determined by measuring the distance from center of one pole to the center of the next pole. If the conductor has been described by weight, its weight shall be calculated by multiplying measured length of the conductor by the standard weight per unit length of the same size of conductor. 3% extra should be allowed both for length and weight to take into account the sag, joining jumpers, wastage, if any, etc.
- (e) The description of finished items of work shall include stringing, jointing, teeing off and connecting.
- (f) Earth Wires – The earth wires shall be described fully and given either in length or weight stating the cross sectional area in square millimeters. The length and weight, as the case may be, shall be determined in accordance with 2 (d).
- (g) Bearer Wire – Bearer wires shall be described either in length or weight stating cross sectional area in square millimeters. The length and weight, as the case may be, shall be determined in accordance with 2 (d).
- (h) Cradles – Cradles shall be described in accordance with the drawing prepared and measured in numbers.

- (i) Stay Assemblies – Stay assemblies or struts shall be fully described and enumerated. Foundation concrete and excavation shall be described and included in the item of work.
- (j) Brackets, Cross Arms and Clamps-Brackets, cross arms and clamps fixed to the poles and struts shall be described and enumerated.
- (k) Wall and Service Brackets – The brackets for overhead lines and service brackets shall be described stating the formation of conductors and enumerated. The method of fixing shall be stated.
- (l) Insulators, Fuses, etc.- Installations of the following items included in the work shall be fully described wherever necessary enumerated and method of fixing stated –
 - (i) Insulators;
 - (ii) Lead-in-tubes;
 - (iii) Line connectors;
 - (iv) Danger boards;
 - (v) Line taps;
 - (vi) Fuses;
 - (vii) Air break switches;
 - (viii) Isolating links, and
 - (ix) Lightning arrestors;
- (m) Anti-climbing Device-Details of anti climbing device shall be described and measured numerically.
- (n) Painting of poles and cross Arms – Painting of poles and cross arms shall be described stating the type of paints, number of coats, etc. and measured on numerical basis.
- (o) Earthing Sets for Poles – Earthing sets shall be enumerated and described to include earth electrode, excavation of earth pit, watering arrangement, cover and filling of charcoal or salt. The main earth leads from the earth electrode including the protection pipe up to the pole is to be measured separately.
- (p) Service connections shall be fully described and given in running meters in case of insulated cables and in length or weight stating the size of bare conductors.

Item No.	Item	Unit	Rate	Remarks
1 EARTHING AND LIGHTENING CONDUCTOR				
3701	Proving and fixing earthing arrangement with 16 mm dia 2.5 meter long galvanized iron or steel rod including packing of charcoal powder and salt as per specification, watering pipe 19 mm dia G.I. connections, etc. complete with refilling the pit as required, but excluding the excavation of earth pit.	each	510.00	
3702	Proving and fixing earthing arrangement with 38.1 mm dia 2.5 meter long galvanized iron pipe electrode, including packing of charcoal powder and salt as per specification, watering pipe 19 mm dia G.I. connections, etc. complete with refilling the pit as required, but excluding the excavation of earth pit.	each	910.00	
3703	Proving and fixing earthing arrangement with 600x600x6.3 mm galvanized iron plate electrode, including packing of charcoal powder and salt as per specification, watering pipe 19 mm dia G.I. connections, etc. complete with refilling the pit as required, but excluding the excavation of earth pit.	each	1420.00	
3704	Proving and fixing earthing arrangement with 600x600x3.15 mm copper plate electrode, including packing of charcoal powder and salt as per specification, watering pipe 19 mm dia G.I. connections, etc. complete with refilling the pit as required, but excluding the excavation of earth pit.	each	8235.00	
3705	Supplying and laying G.I. earth lead duly installed on wall or in G.I. pipe including connections, etc. complete as required -			
	(a) 13 sq. mm. (4 mm. dia)	m	14.00	
	(b) 25 sq. mm. (5.6 mm. dia)	m	21.00	
	(c) 40 sq. mm. (7.1 mm. dia)	m	29.00	
3706	Providing and laying earth continuity conductor including fixing with copper clamps and other necessary materials as per specification along the run of conduit-			
	(a) Aluminum earth continuity conductor -			
	(i) 4 sq. mm.	m	7.00	

Item No.	Item	Unit	Rate	Remarks
	(ii) 6 sq. mm.	m	8.00	
	(iii) 10 sq. mm.	m	11.00	
	(iv) 16 sq. mm.	m	14.00	
	(v) 25 sq. mm.	m	18.00	
	(b) G.I. or steel earth continuity conductor -			
	(i) 6 sq. mm.	m	7.00	
	(ii) 10 sq. mm.	m	8.00	
	(iii) 13 sq. mm.	m	11.00	
3707	Supplying and fixing G.I. pipe 12.7 mm dia (for protection of earth lead) duly installed in position as required.	m	92.00	
3708	Providing and laying aluminum earth continuity conductor of 4 sq. mm along the run of final sub-circuit duly installed inside casing, or batten or PVC conduit in an approved manner.	m	5.00	
3709	Providing and fixing earth terminal as required -			
	(a) for up to 10 sq. mm. earth wire	m	5.00	
	(b) for above 10 sq. mm wire	m	13.00	
3710	Providing and fixing down conductor with G.I./ Copper strip as per specification complete including connections to earth electrode riveting/sweating/soldering etc. as required -			
	(a) G.I. strip 25x3 mm	m	41.00	
	(b) Copper strip 20x3 mm	m	289.00	
3711	Providing and fixing Testing Terminals in position as required with double nut bolts, washers, etc complete including connections -			
	(a) G.I. Testing Terminal	each	21.00	
	(b) Copper Testing Terminal	each	48.00	
3712	Providing and fixing of vertical Air Termination (finals) of 19 mm dia 1.5 m long of copper with 5 spinals including fixing as per specification complete as required.	each	2594.00	

Item No.	Item	Unit	Rate	Remarks
3713	Providing and fixing vertical Air Termination of G.I./Copper rod 12.5 mm. in diameter and 1.5 meter long with G.I. pipe support 38 mm. diameter and one meter long and base plate etc. rewetted / clamped/screwed complete in position as required -			
	(a) G.I. Air Termination	each	448.00	
	(b) Copper Air Termination	each	1243.00	
3714	Providing and fixing of G.I. pipe support each of one meter long and 38 mm diameter, for fixing of vertical Air Termination with base plate etc. complete as required.	each	403.00	

EXTERNAL ELECTRIFICATION AND OVER HEAD LINES

3715	Supplying of supports for overhead lines -			
	(a) Supply of steel tubular pole swaged type as per IS-2713 -			
	(i) ISWP – 8 8.00 meter long	each	8666.00	
	(ii) ISWP – 9 8.5 meter long	each	8974.00	
	(iii) ISWP – 10 8.5 meter long	each	9111.00	
	(iv) ISWP – 11 8.5 meter long	each	9905.00	
	(v) ISWP – 12 9.00 meter long	each	7223.00	
	(vi) ISWP – 13 9.00 meter long	each	9524.00	
	(vii) ISWP – 14 9.00 meter long	each	10387.00	
	(viii) ISWP – 15 9.5 meter long	each	7704.00	
	(ix) ISWP – 16 9.5 meter long	each	8974.00	
	(x) ISWP – 17 9.5 meter long	each	10798.00	
	(xi) ISWP – 18 10 meter long	each	8561.00	
	(xii) ISWP – 19 10 meter long	each	9629.00	
	(xiii) ISWP – 20 10 meter long	each	11487.00	
	(xiv) ISWP – 21 10 meter long	each	14339.00	
	(xv) ISWP – 22 11 meter long	each	10419.00	
	(xvi) ISWP – 26 12 meter long	each	12380.00	
	(b) Reinforced cement concrete pole 9 meter long conforming to IS-785	each	2594.00	
	(c) 76.2 mm. diameter G.I. pipe pole 6 meter long.	each	2852.00	

Item No.	Item	Unit	Rate	Remarks
3716	Erection of pole in existing excavated pit, aligning and keeping it in truly vertical position ready for concreting and back filling, excluding excavation and concreting–			
	(a) Rail poles	each	273.00	
	(b) All Steel Tubular poles	each	183.00	
	(c) R.C.C. Poles	each	245.00	
	(d) G.I. Pipe poles	each	115.00	
3717	Supplying and erection of stay-set complete with 16 mm stay rod anchor plate thimble, stay clamps, turn buckle, etc. with stay wire strain insulator complete duly erected as per specification including excavation and filling foundation in cement concrete 1:3:6			
	(a) With 7/4.00 mm stay wire	each	1238.00	
	(b) With 7/3.15 mm stay wire	each	1169.00	
	(c) With 7/2.24 mm stay wire	each	1035.00	
3718	Supplying of angle/channel/flat iron fitting for overhead lines such as cross arms, clamps, brackets etc. including nuts and bolts, required holes, welding and other necessary materials as per specifications.	kg	55.00	
3719	Labour charges for fixing cross arms of angle iron or channel iron on existing pole as required -			
	(a) Single wire cross arms	each	10.00	
	(b) 2 wire cross arms	each	13.00	
	(c) 4 wire cross arms	each	15.00	
	(d) Cross arm for guard wire	each	17.00	
3720	Labour charges for fixing 'D' brackets of angle iron 50x50x6 mm size on existing pole as required -			
	(a) 'D' bracket on pole	each	102.00	
	(b) 'D' bracket with 20 mm rod pole	each	53.00	
3721	Labour charges for fixing 'D' brackets of angle iron 50x50x6 mm size on existing wall masonry with required materials complete.	each	139.00	

Item No.	Item	Unit	Rate	Remarks
3722	Supplying and fixing glazed porcelain pin insulators of approved make on existing pole or bracket with necessary materials as required -			
	(a) 65x100 mm	each	29.00	
	(b) 80x100 mm	each	36.00	
3723	Supplying and fixing glazed porcelain shackle insulators of approved make on existing pole or brackets with necessary materials as required-			
	(a) 75x90 mm	each	29.00	
	(b) 100x15 mm	each	45.00	
3724	Supplying and drawing standard aluminum conductor of approved make, stringing, marking off complete with binding at existing insulators, jointing, jumpering, teeing off, connecting, etc. as required and cleaning of obstacles (if any) etc.			
	(a) 7/1.96 aluminum conductor	km.	17126.00	
	(b) 7/2.44 aluminum conductor	km.	25999.00	
	(c) 7/2.79 aluminum conductor	km.	32259.00	
	(d) 7/3.40 aluminum conductor	km.	47678.00	
	(e) 7/3.91 aluminum conductor	km.	62798.00	
	(f) 7/4.17 aluminum conductor	km.	70501.00	
3725	Supplying and drawing G.I. guard wire/earth wire/bearer wire 13 sq. mm (4 mm dia) including 7 stringing, binding at existing insulators or brackets, jointing, jumpering, connecting, etc. as required and clearing of obstacles (if any).	km	6110.00	
3726	Labour only for item No. 3724 and 3725 –			
	(a) For aluminum conductor of 7/1.96, 7/2.44, 7/2.79 and G.I. wire of 13 sq. mm (4 mm dia).	km	862.00	
	(b) For aluminum conductor of 7/3.91 and 7/4.17.	km	1137.00	

Item No.	Item	Unit	Rate	Remarks
3727	Supplying and erection of guards for existing overhead lines as required –			
	(a) Cradle type	each	39.00	
	(b) Hexagonal type	each	28.00	
	(c) Ring type	each	25.00	
3728	Supplying and installing aerial fuses -			
	(a) 15/16 Amps 500 volts	each	17.00	
	(b) 30/32 Amps 500 volts	each	25.00	
	(c) 60/63 Amps 500 volts	each	39.00	
3729	Supplying and installing iron clad weather proof cut-outs of approved make on existing pole or surface board/box with necessary materials complete including fixing and connection etc. as required -			
	(a) 15/16 Amps 250 volts	each	48.00	
	(b) 15/16 Amps 500 volts	each	77.00	
	(c) 30/32 Amps 500 volts	each	90.00	
	(d) 60/63 Amps 500 volts	each	202.00	
	(e) 100 Amps 500 volts	each	232.00	
3730	Supplying and installing (overhead) service mains with PVC insulated cable suspended on existing bearer wire in an approved manner as per specification with bobbin insulators etc, or drawn in existing G.I. pipe brackets. or conduit pipe etc. wherever required including connection, testing etc;			
	(a) One wire twin core -			
	(i) 1.5 sq. mm	m	24.00	
	(ii) 2.5 sq. mm	m	27.00	
	(iii) 4 sq. mm	m	29.00	
	(b) Three wire single core -			
	(i) 2.5 sq. mm	m	50.00	
	(ii) 4 sq. mm	m	56.00	
	(iii) 6 sq. mm	m	67.00	
	(iv) 10 sq. mm	m	85.00	
	(v) 16 sq. mm	m	122.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Four wire single core -			
	(i) 4 sq. mm	m	70.00	
	(ii) 6 sq. mm	m	90.00	
	(iii) 10 sq. mm	m	178.00	
	(iv) 16 sq. mm	m	162.00	
3731	Providing and fixing service clamps of G.I. pipe 38 mm diameter 3.5 meter long duly fixed on wall / masonry in an approved manner for service entries, complete with all materials as required.	each	1023.00	
3732	Providing and fixing service clamps of G.I. pipe 19 mm diameter 3 meter long duly fixed on wall / masonry in an approved manner for service entries, complete with all materials as required.	each	424.00	
3733	Supplying and fixing of street light fitting suitable for incandescent lamps on existing pole complete with suitable bracket, double cone E.I. reflector, holders G.I. pipe up to O.H. lines, connecting cables, painting etc. duly installed in an approved manner as required.	each	531.00	
3734	Installing fluorescent street light/M.V. lamp fitting on existing pole including supplying and fixing of suitable G.I. pipes brackets of approved pattern, connecting cable in G.I. protective pipe, nuts, bolts, painting, welding, threading, connections, testing etc. complete as required.	each	777.00	
	(b) Add extra for decorative ornamental arrangement with iron fittings.	kg.	55.00	
3735	Installing of control gearbox for M.V. lamps time switch on existing pole with fixing brackets, connections and other necessary materials as required.	each	218.00	

CHAPTER 38 – ELECTRICAL WORK – MISCELLANEOUS

Notes:-

1. Rates include all lead and lift, for all materials for all items unless otherwise specified.
2. The provision of scaffolding or Ladder or any tools and plants required shall be deemed to be included in the items, unless otherwise stated.
3. Cutting through walls and floors, lifting up floor boards and refixing, cutting out plaster and making good all the work disturbed, notching or drilling holes through joists, etc, shall be deemed to be included with the item of work.
4. Description and enumeration of fittings shall be generally in accordance with note 2 of chapter 35.

Item No.	Item	Unit	Rate	Remarks
3801	Fixing of fluorescent tube fitting on wall ceiling on T.W. blocks with necessary materials including connection etc. complete as required.	each	66.00	
3802	Fixing on fluorescent tube fitting on wall each with the approved type sawn neck steel conduit brackets on T.W. blocks with necessary materials including connection etc. complete as required.	each	167.00	
3803	Fixing of fluorescent tube fitting with pendant arrangement of two pieces of approved metallic chain with necessary materials including connection, 3 core flexible wire etc. complete as required –			
	(a) For pendant length up to 1.5 meter	each	161.00	
	(b) Add for additional pendant length in excess of 1.5 meter.	each	64.00	
3804	Fixing of fluorescent tube fitting with stiff pendant arrangement of two pieces of steel conduit and other necessary material including connection etc. complete as required –			
	(a) For pendant length up to 1.5 meter	each	308.00	
	(b) Add for additional pendant length in excess of 1.5 meter.	each	129.00	
3805	Fixing of fluorescent tube recessed mounting fitting in existing recess with necessary materials including connection etc, complete as required.	each	347.00	

Item No.	Item	Unit	Rate	Remarks
3806	Supplying and fixing fan clamps of 16 mm dia steel bar as per specification complete			
	(a) For stone slab roof 'J' type hook	each	55.00	
	(b) For R.C.C. slabs/beams	each	28.00	
3807	Supplying and fixing fan clamps with hook on existing T.W. Beam trusses with required size flat iron etc. as per specification complete.	each	83.00	
3808	Erection of ceiling/cabin fan in position including wiring, fixing regulator testing etc. with necessary materials complete as required-			
	(a) Regulator on TW boards.	each	45.00	
	(b) Regulator in C.I./M.S. boxes	each	57.00	
3809	Erection of fan regulator in position with necessary materials connection etc. complete as required -			
	(a) On TW boards.	each	13.00	
	(b) In C.I./M.S. boxes	each	20.00	
3810	Erection of exhaust fan in position with required VIR TBC cable, frame bolts etc. complete including connections.	each	48.00	
3811	Erection of wall bracket fan in position with required VIR cable, raw bolts etc. complete including connections and making wall surface good.	each	116.00	
3812	Supplying and fixing down rod for ceiling fan including threading, painting, making holes etc. as required complete.	each	101.00	
3813	Numbering of ceiling fans or fittings with approved paint including all labour, materials etc. complete as required -			
	(a) Lettering up to 7 cm height -	each	1.40	
	(b) Lettering above 7 cm but up to 15 cm height.	each	2.80	
3814	Providing and fixing pilot lamps over main distribution fuse boards/boxes with 16-mm bracket with lamp holder, paw shade. Controlling switch, including wiring and other necessary materials as required-			
	(a) On TW. board	each	147.00	
	(b) On C.I./M.S. box	each	181.00	

Item No.	Item	Unit	Rate	Remarks
3815	Providing and fixing locking arrangement for main switch and switch boards/main and branch distribution boards in an approved type of iron frame with shutter in position, including painting, finishing etc. as required complete.	sqm.	2440.00	
3816	Fixing of house service meter on suitable size of T.W. board with necessary materials and connections, testing etc. complete as per specification -			
	(a) Single phase meter	each	94.00	
	(b) Three phase meter	each	104.00	

CHAPTER – 39 ELECTRICAL WORK – FANS, FLUORESCENT TUE FITTINGS, MERCUREY VAPOUR FITTING AND MISCELLANEOUS

Notes:-

1. Rates include all lead and lift for all materials for all items unless otherwise specified.
2. The provision of scaffolding of ladder or any tools and plants required shall be deemed to be included in the items unless otherwise stated.
3. Cutting through walls and floors, lifting up floor boards and refixing, cutting out plaster and making good all the work disturbed, notching or drilling holes through joists, etc. shall be deemed to be included with the item of work.
4. Rates given in this section are meant only for estimate purposes. The material contained therein shall be supplied by the department.

Item No.	Item	Unit	Rate	Remarks
3901	Approved make electric ceiling fan complete with standard down rod, canopy, hanging shackle blades and speed regulator suitable for operation on 230/250 volts A.C. supply -			
	(i) 900 mm sweep	each	2216.00	
	(ii) 1050 mm sweep	each	2289.00	
	(iii) 1200 mm sweep	each	2536.00	
	(iv) 1400 mm sweep	each	2744.00	
	(v) 1500 mm sweep	each	2846.00	
3902	Approved make electric wall bracket fan complete with wall bracket, canopy, blades, speed regulator suitable for operation on 230-250 volts A.C. supply -			
	(i) 1400 mm sweep	each	4088.00	
	(ii) 1500 mm sweep	each	4480.00	
3903	Approved make speed regulator only for A.C. fans all sizes -			
	(i) Capacitor type	each	168.00	
	(ii) Resistance type	each	420.00	
	(iii) Electronic type	each	364.00	

Item No.	Item	Unit	Rate	Remarks
3904	Approved make electric table fan 400 mm sweep oscillating type with blades, guard, speed regulator and three core flexible cable and three pin plug top, suitable for operation on 230-250 volts.	each	2900.00	
3905	Approved make cabin fan 230 volts oscillating type with base, blades, guard etc. complete.			
	(i) All purpose	each	2128.00	
	(ii) Deluxe type	each	3360.00	
3906	Approved make regulator for cabin fan for 400mm sweep 230 volts A.C.	each	135.00	
3907	Approved make pedestal type electric fan A.C. 230 volts 400 mm sweep oscillating, adjustable height complete with base, stand, blades, regulator, guard etc. with three core flexible cable and 3 pin top complete.	each	4815.00	
3908	Wall mounting exhaust fan of approved make complete with motor, mounting frame, blades, etc. -			
	(i) 380 mm (a) app 900 rpm	each	5198.00	
	(b) app 1400/1500 rpm	each	5383.00	
	(ii) 450 mm (a) app 900 rpm	each	6096.00	
	(b) app 1400/1500 rpm	each	6456.00	
	(i) 900 mm (a) app 700 rpm	each	10471.00	
	(b) app 900 rpm	each	11376.00	
3909	Speed regulator for exhaust fan -			
	(a) Resistance/Capacitor type -			
	(i) For 380 mm	each	448.00	
	(ii) for 450 mm	each	530.00	
	(iii) for 900 mm	each	586.00	
	(b) Electronic type for all sizes -			
	(i) 375 mm	each	560.00	
	(ii) 450 mm	each	699.00	
	(iii) 600 mm	each	828.00	
3910	Louver shutters for exhaust fan	each	606.00	

Item No.	Item	Unit	Rate	Remarks
3911	Approved make air circulators, suitable for operation on 230 volts, A.C. complete adjustable with base, stand, blades, guard. Speed regulator, flexible cable, etc.	each	6719.00	
FLUORESCENT TUBE FITTINGS				
3912	Approved make of fluorescent single tubes, batten, type fitting complete with copper wound choke, starter, lamp holder complete duly wired etc, but without tube.	each	448.00	
3913	Approved make of fluorescent tube fitting rust resistant, stove enameled, channel/rail/box type with copper wound choke, capacitor, starter, holder etc. duly wired complete, but without tube -			
	(i) 1x40 watt	each	560.00	
	(ii) 2x40 watt	each	816.00	
	(iii) 1x20 watt	each	520.00	
3914	Approved make of industrial type fluorescent tube fitting, rust resistant, stove enameled, with copper wound choke, capacitor, starter, lamp holder complete, with stove enameled reflector but without tube -			
	(i) 1x40	each	850.00	
	(ii) 2x40	each	1090.00	
3915	Approved make and type of fluorescent tube decorative fitting, comprising of metallic channel base, copper wound chock capacitor, starter, lamp holder etc. complete duly wired, but without tube -			
	"A" 1x40 watt			
	(i) With opal acrylic diffuser	each	1960.00	
	"B" 2x40 watt			
	(i) With decorative attachment consisting of M.S. reflector & opal acrylic diffuser and polystyrene end plates.	each	3304.00	
	(ii) With perforated M.S. side panels M.S. end plate and polystyrene end plates.	each	2323.00	

Item No.	Item	Unit	Rate	Remarks
3916	Approved make fluorescent street light fitting complete with copper wound choke starter, capacitor, lamp holder, start holder etc; duly wired side entry with clear acrylic covers but without tube -			
	“A” 2x20 watt			
	(i) Popular	each	745.00	
	(ii) Deluxe	each	1848.00	
	“B” 1x40 watt.			
	(i) Popular	each	745.00	
	“C” 2x40 watt.			
	(i) Popular	each	1058.00	
	(ii) Deluxe	each	2911.00	
3917	Approved make of tubular fluorescent lamp -			
	(i) 20 watt 61 cm	each	156.00	
	(ii) 40 watt 122 cm	each	168.00	
	MERCURY VAPOUR FITTING.			
3918	Approved make of high-pressure M.V. fitting. Consisting of metal canopy housing for control gear, highly polished reflector, highly transparent acrylic hinged cover complete with taped choke, capacitor, connector etc. suitable for end mounting duly wired but complete, without tube –			
	(a) 125 watt -			
	(i) Popular	each	3248.00	
	(ii) Deluxe	each	3920.00	
	(b) 250 watt -			
	(i) Popular	each	6551.00	
	(ii) Deluxe	each	10415.00	
	(c) 400 watt -			
	(i) Popular	each	6944.00	
	(ii) Deluxe	each	10806.00	

Item No.	Item	Unit	Rate	Remarks
3919	Approved making of post-top street lighting lanterns, comprising top circular metal canopy, inside high glass enamel and out side suitably coated to make it weather proof, bottom of circular acrylic bowl, conical metallic base for installing complete fitting on a pipe pole with two pin B.C. lamp holder etc. suitable for 80/125 watt M.V. lamp but without controlling gears, lamp etc.	each	2296.00	
3920	Approved make of mercury vapour lanterns suitable for 125/80 watt M.V. lamp/160 watt blended lamp consisting of enclosed cast aluminum canopy, finished in stove enameled white inside and hammer tone grey outside, heat resistant closed/open glass bowls, and rubber gasket, but excluding controlling gears, lamp etc.	each	643.00	
3921	Anti-rust treated, stove enamel finished weatherproof and drip water-proof and aponage rubber gasketed, control, gear box, pole or wall mounting suitable for housing the control gear of lamps –			
	(i) 1x125 watt M.V. lamp	each	2098.00	
	(ii) 1x250 watt M.V. lamp	each	3554.00	
	(iii) 1x400 watt M.V. lamp	each	4031.00	
	(iv) 1x250 watt sun lamp	each	8959.00	
3922	Taped polyester choke for mercury vapour lamp suitable for -			
	(i) 125 watt,	each	673.00	
	(ii) 250 watt,	each	1231.00	
	(iii) 400 watt,	each	1539.00	
	(iv) 250 watt sun lamp	each	3360.00	
3923	Capacitor for fluorescent mercury vapour/ S.Q.M. lamp suitable for -			
	(i) 3.5 MFD	each	185.00	
	(ii) 4 MFD	each	185.00	
	(iii) 8 MFD	each	308.00	
	(iv) 10 MFD	each	336.00	
	(v) 33 MFD	each	1400.00	

Item No.	Item	Unit	Rate	Remarks
3924	High pressure mercury vapour lamps -			..
	(i) 125 watt,	each	609.00	
	(ii) 250 watt,	each	1370.00	
	(iii) 400 watt,	each	2089.00	
	(iv) Blended Lamp MML 160 W	each	474.00	
3925	High pressure Sodium Vapour Lamp (Sun)			
	(i) 250 watt	each	4480.00	
3926	Supply of approved make and accepted standard H.P. sodium vapour, street lighting luminaries consisting of metallic (cast aluminum alloy) housing highly polished aluminum mirrors, clear acrylic covers, gasket and equipped with quality accessories such as ballast, condenser, igniter skirted ceramic lamp holder suitable for 250 WHPSV lamp complete but without Sun lamp.	each	13326.00	
MISCELLANEOUS				
3927	Out door general purpose flood light fitting, complete with heat resistance, glass, highly polished metallic reflector housing, lamp holder stand etc. complete, but without lamp suitable for -			
	(i) Up to 200 watt	each	1231.00	
	(ii) Up to 1000 watt	each	1764.00	
3928	Out door general purpose flood light fitting, comprising of highly polished reflector housing, water tight, heat resistance, clear front glass covers, adjustable lamp holder stand etc. complete, but without lamp -			
	(i) Special 500/1000 watt	each	2380.00	
3929	Outdoor weather proof long range flood light projector complete with highly polished, detachable reflector, water tight, heat resistant front glass adjustable lamp holder for focussing with a movable stand, P.N. control gear box containing condenser HPL 1000 watt ballast etc. complete but without lamp.	each	18086.00	

Item No.	Item	Unit	Rate	Remarks
3930	Vitreous enameled sheet steel dispersive reflector for industrial lighting –			
	(i) Suitable for 60 to 200 watt. GLS or 80 w HPMV lamp.	each	504.00	
	(ii) Suitable for 500 w GLS or 125/250 w HPMV lamp.	each	810.00	
3931	Table stand, adjustable to ensure flexible adjustment of light in a desired position complete with reflector, stand lamp holder, switch flexible cord Up to 2 meter and plug but without lamp –			
	(i) Junior type	each	474.00	
	(ii) Senior type	each	979.00	
3932	Bed-cum-night lamp fitting, complete with reflector, lamp holder, thread switch etc. but without lamp.	each	363.00	
3933	Wall mounting storage type automatic electric water heater complete with inner copper container sheet steel outer container heating element, thermostat indicating lamp, connections with inlet and outlet pipes vent pipe connections, etc. –			
	(i) 25 liters capacity	each	8818.00	
	(ii) 35 liters capacity	each	10329.00	
	(iii) 50 liters capacity	each	12319.00	
3934	Electric geyser 1 to 3 KW capacity with two switches for hot water automatic with pilot lamp etc. complete.	each	3920.00	
3935	Mini room heaters, 750w rod element without switch	Each	364.00	
3936	General purpose room heater 1000w rod element, without switch.	Each	700.00	
3937	Room heater, 2000 w double rod element adjustable heat control with switch for one element.	each	1371.00	
3938	Desert type room cooler complete with heavy duty electric fans, reservoir, water pump for circulation of water khas tattis, sheet metal enclosures having sheet steel grill on three sides and suitable front / grill / cover and control switches for suitable 230 volts AC			
	(i) Junior with stand	each	17470.00	
	(ii) Senior floor mounting/window mounting	each	19374.00	

Item No.	Item	Unit	Rate	Remarks
3939	Refrigerator compressor type-			
	(i) 165 liters capacity	each	27998.00	
	(ii) 285 liters capacity	each	38076.00	
3940	Air conditioning unit complete window type with water tank -			
	(i) 1 tonne capacity	each	60474.00	
	(ii) 1½ tonne capacity	each	75591.00	
	(ii) 2½ tonne capacity	each	123186.00	
3941	Water coolers -			
	(i) Instantaneous type	each	17918.00	
	(ii) Storage type	each	30240.00	
3942	Time switch single pole 30 Amps 200/250 volts.	each	4200.00	
3943	Supply of distribution Transformer of accepted standards and specifications, 11/0.4 K.V indoor or outdoor type with hand operated, off load tap changing switch drain and filter valve, two earthing terminals, lifting of oil			
	(i) up to 100 KVA	KVA	1410.00	
	(II) up to 160 KVA but more than 100 KVA	KVA	1545.00	
	(III) up to 250 KVA but more than 160 KVA	KVA	1390.00	
	(iv) up to 400 KVA but more than 250 KVA	KVA	1314.00	
	(v) above 400 KVA	KVA	1146.00	
3944	Installation charges for transformer (labour only) -			
	(i) outdoor type pole mounting (up to 500 KVA)	each	5375.00	
	(ii) outdoor type pedestal mounting	each	5375.00	
	(ii) indoor type	each	4031.00	
3945	Supply of iron-clad totally enclosed, overhead bus-bar trunking system (for power wiring for industrial establishment) (can also be used for rising mains) -			
	(i) Overhead bus-bars -			
	(a) 200 Amps. T.P.	m	1568.00	
	(b) 200 Amps. TP & N	m	1763.00	

Item No.	Item	Unit	Rate	Remarks
	(ii) T.P plug in box suitable for mounting on TP bus-bars-			
	(a) 30 Amps.	each	1314.00	
	(b) 60 Amps.	each	1539.00	
	(c) 100 Amps.	each	1791.00	
	(iii) TP&N plug in box suitable for mounting on T P & N bus-bars-			
	(a) 30 Amps.	each	1511.00	
	(b) 60 Amps.	each	1791.00	
	(c) 100 Amps.	each	4283.00	
	(iv) incoming connector housing for heavy duty cable -			
	(a) 300 Amps. T.P.	each	3528.00	
	(b) 300 Amps. TP & N	m	4031.00	
3946	Supplying of Deep well Ejector type water pump with suitable electric motor, but excluding switch gear with 15 meter column assembly -			
	(i) 1 H.P.	each	27998.00	
	(ii) 1.5 H. P.	each	30796.00	
	(iii) 2 H.P.	each	40315.00	
	(iv) 3 H.P.	each	47035.00	
	(v) 5 H.P.	each	54874.00	
	(vi) 7.5 H.P.	each	68313.00	
3947	Supplying of centrifugal water pump sets with suitable electric motor, but excluding switch gear- "A" coupled typed pumping sets-			
	(i) 3 H.P.	each	21445.00	
	(ii) 5 H. P.	each	26205.00	
	(iii) 7.5 H.P.	each	32279.00	
	(iv) 10 H.P.	each	37516.00	
	"B" Mono block type pumping sets-			
	(i) 2 H.P.	each	17358.00	
	(ii) 3 H.P.	each	19344.00	
	(iii) 5 H.P.	each	25198.00	
	(iv) 7.5 H.P.	each	29061.00	
	(v) 10 H.P	each	35276.00	

CHAPTER 40- ELECTRICAL WORK – LABOUR RATES FOR WIRING

Notes :-

1. Rates include all lead and lift, for all materials for all items, unless otherwise specified.
2. The socket out let point on the same board shall be treated as 1/2 point in the respective system of wiring.
3. Labour rates for point are inclusive of labour for fitting all accessories and fittings such as switch, ceiling rose, sockets, Brass lamp holders etc. as required.
4. Labour rates for each circuit shall be same as one point in respective system of wiring.

Item No.	Item	Unit	Rate	Remarks
4001	Labour rate for wiring a light/ Fan/ Twin control light/ socket out-let on separate board/call-bell point on TW batten system.	each	54.00	
4002	Labour rate for wiring a light/ Fan/ Twin control light/ socket out-let on separate board/ call- bell point on TW casing and capping system.	each	68.00	
4003	Labour rate for wiring a light/ Fan/ Twin control light/ socket out-let on separate board/call-bell point in (open) rigid steel conduit system.	each	81.00	
4004	Labour rate for wiring a light/ Fan/ Twin control light/ socket out-let on separate board/call-bell point in	each	81.00	
4005	Labour rate for wiring a light/ Fan/ Twin control light/ socket out-let on separate board/call-bell point in surface (open) rigid PVC conduit system.	each	81.00	
4006	Labour rate for wiring a light/ Fan/ Twin control light/ socket out-let on separate board/call-bell point in recessed (concealed) rigid PVC conduct system.	each	81.00	
4007	Labour rate for wiring a power point exclusive of socket outlet in surface rigid steel conduit system, including labour for fixing earth continuity conductor.	each	95.00	

Item No.	Item	Unit	Rate	Remarks
4008	Labour rate for wiring a power point (exclusive of socket outlet) in recessed (concealed) rigid steel conduit system, including labour for earth continuity conductor.	each	108.00	
4009	Labour rate for fixing rigid steel conduit in surface conduit wiring system, as per specification -			
	(i) 20 mm conduit.	m	13.00	
	(ii) 25 mm & 32 mm conduit	m	20.00	
	(iii) 40 & 50 mm conduit	m	21.00	
4010	Labour rate for rewiring light / fan / Twin control light/socket out-let on separate board/call-bell point in rigid steel /rigid PVC non metallic conduit in (open) surface conduit wiring system.	each	41.00	
4011	Labour rate for rewiring of light/fan/twin control light/socket/out-let on separate board / call-bell point in rigid steel / rigid PVC non-metallic conduit in recessed (concealed) conduit wiring system.	each	49.00	
4012	Labour rate for fixing rigid steel conduit as per specification in recessed (concealed) conduit wiring system-			
	(i) 20 mm conduit	m	24.00	
	(ii) 25 mm & 32 mm conduit	m	33.00	
	(iii) 40 mm & 50 mm conduit	m	39.00	
4013	Labour rates for drawing cables in existing rigid steel conduit (surface or recessed)-			
	“A” 2 wires-			
	(i) 2.5 sq mm/4 sq mm/ 6 sq mm	m	5.00	
	(ii) 10 sq mm/16 sq mm/25 sq mm	m	6.00	
	(iii) 35 sq mm/50 sq mm	m	8.00	
	“B” 3 wire & 4 wires-			
	(i) 2.5 sq mm/4 sq mm/6 sq mm	m	6.00	
	(ii) 10 sq mm/16 sq mm/25 sq mm	m	10.00	
	(iii) 35 sq mm/50 sq mm	m	11.00	

CHAPTER 41 - DRILLING OF TUBE WELL

Notes :-

1. General: -
 - (a) The rates are based on the working rates of the departmental rig including the labour charges and market rates for the miscellaneous items required for the drilling of the tube wells.
 - (b) The contractor shall make or repair the approach roads at his own cost, for which no extra amount will be payable to him.
 - (c) All stores supplied to the contractor by the department will be lifted by him from the sub-divisional stores at his own cost.
 - (d) Precautions should be taken to prevent damage to the tube well during the drilling. Precautions should also be taken to avoid any accident during drilling.
 - (e) The drilling shall be done in accordance with the specification.
 - (f) Fixing of tube well sites marking their numbers, fixing water level gauges/records collection of well data etc. will be done by the department.
 - (g) The rates provided in this schedule include the cost of all materials and labour required for performance of all workmanship including other necessary items etc. required for the proper execution of tube well construction. The rates of all items include transport of machinery from the contractors place or office to the site of work and from one tube well site to another.
 - (h) The rates also include water charges required for drilling work. No extra payment for water and its lead will be paid. However the contractors will be allowed to take water from Government owned tube well if available close to drilling sites. The rates for water used by contractor from Government tube wells would be according to the volumetric rates fixed by Water Resources Department from time to time. The use of such water can be allowed only when it can be done without detriment to the primary purpose for which the source is meant.
 - (i) No claim for compensation for amount paid by drilling contractors in respect of any passage rights through the private properties or field will be entertained. The officer in-charge of the construction shall however assist the contractor using his good offices for having such facilities either at no charge or minimum reasonable charges. In case of any dispute between the contractor and the cultivator the charges fixed by Agriculture or Revenue authorities shall be payable by the contractor without any claim for reimbursement by the department.

2. Well assembly and supply of pipes :-
 - (a) The rates of blind and slotted pipes include the cost of transportation, storage and supervision charges. The pipes shall be supplied departmentally at Sub-Divisional stores. Extra lead for carting will only be permissible for the materials supplied departmentally from the place other than sub-divisional store.
 - (b) In the case of well assembly, supplied by the Department only labour charges for lowering will be payable to the contractor. If the contractor wants to use his own pipes, he shall obtain written permission from the competent authority, and before lowering well assembly, he shall get it checked and measurements recorded by the Engineer-in-Charge.
 - (c) Contractor shall submit monthly statement of stock to Engineer-in-Charge of work in case of pipes etc. supplied departmentally.
 - (d) Precautions should be taken to prevent damage to the pipes and other assembly during lowering in to the well.
 - (e) The lowering of well assembly shall be done as per specifications.

3. Development (a) The rates include the average rates of 7,9 cum/M (cubic meter per minute) or more than 9 cum/M. compressors, the rates of consumable and the labour charges.
 - (b) The development by compressor shall be done by 7, 9 and above 9 cum/M compressors depending upon the type of Tube well i.e. shallow or Deep. Work by compressors with less than 7 cum/M capacity or with more than 9 cum/M capacity will be done after the permission of Engineer-in-Charge is obtained. Development can also be done by over pumping methods.
4. Yield Test- (a) The rates include, the working cost of submersible pump of 0.03, 0.06, 0.09 cumec or more capacity at 30 m head keeping in view the designed discharge, including labour charges and cost of consumables.
 - (b) The yield test shall be done as per para 5.3 of IS:- 2800 (Pt-II) 1979.
5. Labour charges for installation of pumps :- (a) Rates cover all labour charges, transportation of pipes and accessories, fixing clamps, trial test, fixing irrigation panel etc.
 - (b) The suitable pump motor unit and its accessories shall be supplied by the Department at Sub-Divisional stores. The contractor shall be paid labour charges only.
6. Specifications for the construction of tube wells.

A General: - A complete tube well shall mean:-

 - (a) A bore hole vertical within the prescribed non-vertical limits drilled up to designed depth in alluviums or rocky areas.
 - (b) Installation of requisite well assembly i.e., housing pipe, blind pipe, slotted pipe of strainers, bail plug and other accessories.
 - (c) Placing of suitable gravel pack (in case of gravel, packed tube wells). Placing of suitable sand pack (in case of sand packed tube wells).
 - (d) Development of tub-well with object of :-
 - (i) Producing effect of natural gravel pack (in case of naturally packed design).
 - (ii) Producing maximum sand free yield of water for the specified standard draw down in alluvium and rocky areas.
 - (e) Conducting yield test by over pumping of the tube well.
 - (f) Installation of suitable turbine, or submersible pump assembly as specified and comprising of :-
 - (i) Pump (ii) Motor (iii) Column (iv) Airline (v) Sluice and Reflux valve (vi) Water level guard with signal cable and electrode (vii) Pressure gauge (viii) Water

level indicator (x) Irrigation panel containing starter no load and over current relays with metal parts duly earthed as per India Electricity Rules, 1936.

- (g) Making provision of pump house as per specified design.
 - (h) Energisation of tube well and handing over to the cultivator, with specified completion certificate and manual of preventive instructions as per booklet 'Aapke Apna Nalkoop'
- B. Strata:- (a) Rocky area shall mean, area where the strata essentially comprises of the rock formation. Rocks may be with or without fissures and faults, joints and bedding planes, may have fractured and weathered zones. Rocks may be soft, medium or hard, and comprise of shale's, sand stones, lime stones, dolomites, quart-sites, basalts, granites, schist's, fillites, slates, gneisses and their intercalation, intrusive and conglomerates of these, but shall exclude clays, sands, pebbles, cobbles and boulders moorum and silt stones.
- (b) All alluvium areas shall mean areas where the strata comprises of loose, unconsolidated materials like clays, sits, s ands gravels, pebbles, cobbles and boulders.
- C. Verticality and alignment :- (a) Verticality of a tube well means verticality of casing pipe or housing pipe up to 200 mm dia and up to 30 m depth in one direction and in one plane and up to 50 m depth for casing pipes of more than 200 mm dia.
- (b) The bore hole should be in a vertical alignment so that installation of vertical turbine pump or submersible pump can be done in the tube well without any difficulty. Alignment means plumbness and straightness of the tube well. Plumbness refers to the variation with the depth of the actual centre line of the tube well from the true vertical line drawn through the centre of the tube well from top, down to its depth. Straightness merely considers whether actual centre line of the tube well is straight or otherwise. Thus a tube well may be straight but not in plumb, since its alignment may be displaced in one direction or other from the vertical.
- A drilled hole may not be in a perfect vertical alignment because of various reasons, hence a tolerance limit of verticality has been fixed while drilling, such that within this limit also the installation of vertical turbine pump or submersible pump is possible in the tube well.
- (c) The limits of verticality of shallow and deep tube wells are specified in the table given below and will be applicable to all contracts.

Limits of Verticality:-

Serial No.	Type of tube well	Dia of bore	Dia of casing	Permissible limit of verticality in 30 m depth (all in one direction)	Penalty for non-verticality beyond permissible limits
1	Shallow	Up to 30 cm	15 cm	15 mm	(a) Rs. 200 per tube well when pump can be installed (b) Rs. 500 per tube well when zigzag bore is used and pump can be installed.
2.	Shallow & deep	37.2 cm or 40 cm	20 cm	30 mm	10% deduction in the cost of drilling of tube well, provided pump can also be installed.
3.	Deep	45 cm or more	25 cm or more	50 mm	do

- (d) Method of testing verticality-Refer figure on page no. 304. The plumb is a short cylinder with outside dia about 6 mm smaller than the casing pipe of the tube well. It is provided with a hook by which it can be suspended on a wire line. The point of suspension must be in the exact centre of the device, which can be achieved by means of adjustable guide pulley. The plumb-bob should be heavy enough to stretch the line taut. A 3-mm wire cable makes a good line that does not kink easily.

A transparent plastic sheet on which a number of concentric circles are marked and a slot is cut, extending from the centre out to the edge of the sheet, is placed on housing pipe. The concentric circles permit centering the plastic sheet accurately on top of the well casing.

The sheet is used first to determine, whether the wire line is in the centre of the casing with the plumb bob hanging just below the top of the pipe.

As the plumb-bob is lowered below the top of the pipe, the plastic sheet can be rotated on the top of casing pipe until the slot is oriented in the direction that the wire line tends to drift away from the centre. Measurements along the edge of the slot can be then made to determine the amount of drift as the test proceeds. Drift from the perpendicular at any depth can be calculated from the formula :-

$$V = \frac{H}{hxe} + \frac{D - d}{2}$$

- here V = Drift in cm at depth H
H = Total depth from point of suspension in m.
H = Height of point of suspension of gauge disc above top of lining tube in m.
e = Eccentricity of suspending wire from central axis measured in cm at top of lining tube.

D = Dia. of bore hole in cm.

D = Dia of gauge plate in cm.

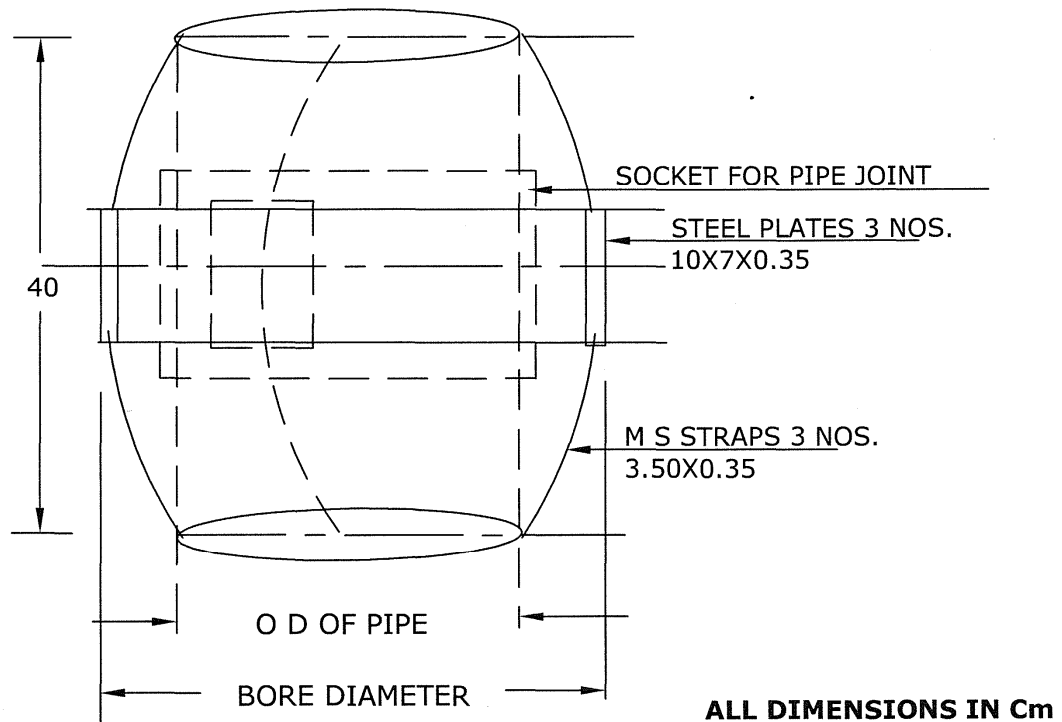
- D. Materials: - (a) Housing pipe – It is the pipe provided in upper portion of the tube well in which pump and motor assembly is accommodated. The dia of the housing pipe should be 25 mm more than the bowl dia of the pump with capacity up to 750 liters minute. In case of pump having capacity more than 750 liter minute and up to 1815 liter minute, the dia of housing pipe should be kept as 50 mm more than the bowl dia of pump. The clearance is allowed so that the pump may be lowered without any damage to the cable etc. the pipe should be of heavy duty and provided at least 0.6 m above the ground level to have good and strong foundation. Further length of the pipe should be decided as given below:-

Length of housing pipe = (0.6 m above ground + Depth of SWL)

= (Fluctuation + draw down + length of pump motor assembly + 0.9 m extra)

- (b) Blind pipe or casing pipe-Blind pipe or casing pipe is provided in non-aquifer-portion and below housing pipe and up to slotted pipe. The dia of the blind pipe can be less than the housing pipe in order to have economy in construction cost. The length of the blind pipe should be decided on the basis of non-aquifer portion or unwanted aquifer portions, which are to be cased.
- (c) Slotted pipe or screen: - The screen or slotted pipe should be provided against the required thickness of aquifer in order to allow ground water to be pumped into the tube well. The length of the slotted pipe should be decided by the thickness of the aquifer portion needed to be tapped and normally the screen should be provided against coarsest and bottom most aquifer layer. The upper one and unwanted aquifer layers should be made up by smallest feasible dia blind pipe.
- (d) The housing pipe, blind pipe and slotted pipe (as mentioned above in a, b, and c) to be used in the tube-well, shall be of mild steel conforming to IS: 1239 (Pt-I)- 1985 for dia up to 150 mm and IS:4270-1983 for dia above 150 mm. the pipes may be seamless or Electric Resistance welded as may be contracted for and approved by the Engineer-in-Charge with specified threads. Plain ended pipes, duly welded on work-spot or pipes with threaded ends with sockets can also be used. In order that the well assembly be centrally lowered in the bore, the housing and casing pipe to be fitted in alluvium or overburden portion of the tube well shall be fitted with centralising guides of the design specified by the department or specially approved by the Engineer-in-Charge. These guides should be fitted at every 10 m subject to minimum of 3 guides per tube well.

SPECIFIED CENTRALISING GUIDE



- e) The slotted pipes to be used will have lined slots (vertical or horizontal) of required size to give an area of opening as prescribed in the design. The percentage area of opening will be generally 15 to 22%. The slot size should not exceed the thickness of slotted pipe. Generally the slot size will be D 10 size of the gravel pack or may be within limits of 1 mm to 3 mm thickness. The length of the slot can also vary from 50 mm to 80 mm within the prescribed percentage area of opening allowed. The length of the slotted pipe/strainer will not be less than 3 m. The slotted pipe shall be attached to the housing or blind pipe by means of a strong M.S. coupling (reducer if required) of quality and design approved by Engineer-in-Charge.

Screen length- The length of strainer is usually determined from the thickness of the aquifer encountered. It is not necessary to screen the whole depth of the aquifer and only that depth should be screened, which will be enough theoretically for about 200% of the desired discharge. Wherever a full aquifer has been drilled through, the screened portion of the aquifer may be limited as follows:-

- (i) In fine sand gravel aquifers, only 40% of the aquifer need be screened.
- (ii) In coarse to medium sand grade aquifer, a maximum of 60% of the aquifer be screened.

- (iii) In confined aquifer the percentage of strainer length should be kept:-

Thickness of aquifer	% of screen length
Less than 7.5 m	70
7.5 m to 15 m	75
Above 15 m	80

- (f) 1.5 m long bail plug of M.S. blind pipe with close bottom and lifting hook of 20 mm dia bars or bail plug of approved type shall be provided at the bottom of screen pipe.
- (g) Standard slot size for 150 mm dia 4.85 mm thick slotted pipes are slot size 76.2 mmx3.2 mm.

Design pattern (staggered and vertical)-

- | | | |
|-------|----------------------------------|-------|
| (i) | No. of slots per set - | 3 |
| (ii) | No. of sets per row- | 11 |
| (iii) | No. of rows per m- | 13 |
| (iv) | No. of slots per m- | 429 |
| (v) | % Area of opening at inner face- | 22.2% |
- (h) Slot size 72.5x1.6 mm
- | | | |
|-------|----------------------------------|-------|
| (i) | No. of slots per set- | 5 |
| (ii) | No. of sets per row- | 12 |
| (iii) | No. of rows per m- | 13 |
| (iv) | No. of slots per m- | 780 |
| (v) | % Area of opening at inner face- | 19.2% |
- (i) Painting: - Before placing into bore holes coat of approved anti-corrosive paint should be given to all the mild steel parts of the well assembly, both inside and outside.
- (j) Gravel packing: - The term gravel packing is used to be placing of uniform gravel adjacent to the well screen. The thickness of the pack ranges from 75 mm to 150 mm depending upon design.

The main purpose of gravel pack is to enable water bearing formation to yield sand free water to its maximum capacity. The gravel must be-

- (i) Fine enough to prevent the passage through its pores of particles from the formation materials.
- (ii) Coarse enough to give a lesser resistance so that the head loss in flow of water through it should be relatively small.

The gravel in the pack shall consist of clean, hard, well-rounded uniform particles of silica or quartzes free from dirt, foreign material as well as

flaky particles. The uniformity coefficient $cu = (D_{60}) / (D_{10})$ shall not be more than 2. The size of the gravel will depend upon mechanical analysis of the aquifer materials for uniform aquifer.

The packing of gravel around the well assembly will be a continuous process and shall start from bottom upward. The gravel should be packed systematically in layers through 35 mm dia to 50 mm dia GI pipe. A 450 mm dia trough can be manufactured and to it 3 such GI pipes are attached. The trough kept on casing pipe of the tube well from which pouring of the gravel can be done conveniently. The three G.I. pipes should at least be carried down on the side walls of the casing up to 200 mm to 250 mm detailed instructions given in technical circular No. 17-D&R-71, dated, 16-6-1971 issued by the Director, Tube wells.

- (k) Prepacked filters:- The prepack filters are suitable when the gravel of suitable size and quality is not available within a reasonable economical lead. For determining its feasibility, the study may be made for the extra cost of prepack filter and the amount expected for the transportation. If the transportation charges for gravel comes more than the difference of cost of prepack filter and the suitable screen, it should be used. The prepack filter is available in different dia pipes. It reduced the dia of the above. A prepack filter filled with 2.5 cm thickness prepack on 15 cm slotted pipe can easily be installed on 25 cm dia bore and the intervening spaces filled with formation stabiliser. These filters can be used to advantage in fine sandy aquifers which will otherwise need installation of brass Strainer No. 20 or 0.5 mm slot size. It can be used both for confined and unconfined aquifers. The grain sizes of the pack are available in 6 mesh (3.36 to 4 mm), 8 mesh (2.38 to 3.36 mm) and 10 mesh (2 to 2.38 mm) and suitable one can be chosen based on D-60 of the formation and method of drilling employed.
- (l) Use of cage type wire wound Strainer/Brass Strainer:- These strainers are used in fine sandy formation or for filter points. In this a fine mesh is wound around the M.S. perforated pipes (64 hole of 2 cm dia/30 cm). The size of the perforations varies from 1.5 cm to 2 cm dia depending upon the dia of the M.S. pipe around the mesh a copper wire is wound in helical manner on which a brass punched strap is provided. The actual area available is the area of perforation in M.S. pipes and the wire mesh. These are relatively cheaper than the brass strainer.
- (m) Column pipe: - It is G.I. pipe directly connected with pump motor assembly, acts as delivery pipe, which is brought above top of housing pipe, and provided with a 90° bend and a sluice valve for controlling discharges. The entire pump motor assembly along with column pipes rests on top of housing pipe by means of two strong clamps as specified. Length of column pipe is governed by: - (SWL- fluctuations-draw down \pm 0.6 m) and it should have 0.9 m horizontal length. Dia of the column pipe will be decided by the size and capacity of the pump.
- (n) Pumps:- For function of tube-wells either vertical turbine or submersible pumps are in use. The selection of pump will depend upon the pumping head and discharge.

- (i) Pump setting should be kept at, $H = (\text{Peak summer SWL} + \text{Permissible draw down} + \text{seasonal fluctuation})$. Additional head for frictional loss and 5 cm for command should also be accounted, and thus total head H for the pump is arrived.
- (ii) The horsepower of the pump is then worked out from the relation.

$$\text{H.P.} = \frac{WQH}{75}$$

Where

H.P. = horsepower.

Q = Discharge in cubic meter per second

W = Unit wt. Of water in kg/cum

H = Head against which water is to be lifted in m.

N = Efficiency of Pump-motor assembly.

- (o) Valves: - Gun metal sluice valve of size 50, 60, 75 and 100 mm should be used.
- (p) Irrigation panels of following specification may be used.
 - (1) D.O.L. up to 5 H.P.
 - (2) Star – Delta type form 5 HP-12.5 H.P.
 - (3) Auto Transformer Starter above 12.5 H.P. Suitable capacitor improving power factor as per recommendation of M.P.E.B. should also be installed.
- (q) Water level guard will have single electrode 20 mm and with single indicator.
- (r) Pressure gauge will be of 100 – mm size.
- (s) Bentonite for drilling mud should have swelling factor of 1200%

7. Drilling :- (a) The contractor will employ his reverse circulation, Direct rotary, cable percussion or down the hole hammering or Calyx machine (as may be suitable for the formation) to drill the holes of size and depths indicated in the design. The contractor shall provide all equipment for the execution of this work.
- (b) The contractor shall make his own arrangement for water required for drilling purposes and also for ancillary excavation. He shall also arrange for the drilling mud and mud pump etc., where required. Any precautions or steps required to control caving of the bore hole shall also be the responsibility of the contractor.
 - (c) Contractor shall also make arrangements of first aid facilities available during any accident. All care and precautions should be taken and it should be ensured that there shall be no accidents while drilling the bore hole. Proper dress and

equipment like gumboots, helmets and tentage for drilling shall be provided to the workmen at site.

8. Sample Collection:- (I) The contractor shall take samples (not less than 500 gms) of stratum at his cost at every 3 m or often where the stratum changes and shall preserve these samples with care at the site for the inspection of Engineer-in-Charge or his authorised representative. In addition at least 1 kg of samples of all the aquifer materials in proper sample boxes or bags be handed over to Engineer-in-Charge free of cost for mechanical analysis. All such samples along with 2-kg sample of gravel if being used be sent to the laboratory of tube-well organisation immediately for testing and design of screen and gravel pack size. Particular of tube-well No. etc., should invariably be given along with samples.

- (ii) Tube-well/dug-well water samples are also to be collected and sent to laboratory of tube-well department for their chemical analysis.

Water sample for analysis should be collected in 2 liters bottle made of glass, polyethylene or hard rubber, where transportation is expected glass containers should be avoided as much as possible. Bottle should be thoroughly washed and rinsed before collecting the water samples.

In case of tube-wells, the pump should run at least for 10 minutes before the sample is obtained for test.

Sample should be sent to laboratory for analysis as soon as possible within 24 hours but not later than 60 hours.

The sample container should be marked with unwashable paint, well No. and sample number. The position of the well under test should be marked on the mazmuli map showing the proper well No. with a map, showing well No. name of village and name of owner of tube-well.

The log details of the well should also be prepared along with the assemble details and it should be sent to the tube-well organisation for record.

- (iii) Rock samples of tube-wells or collected rock sample from any specific area of ground water interests should also be sent to laboratory for petrological tests.

9. Lowering of well assembly- The contractor shall have to ensure that the slotted pipe strainers are lowered in the well at the places indicated in the design. The lowering of the assembly should be done by the contractor in the presence of the person duly authorised by the Engineer-in-Charge for this purpose. The contractor shall see that the joints in pipes are rigid, water tight and free from kinks. Immediately after lowering the assembly the contractor shall furnish a chart showing the aquifer positions in the bore and the location where slotted pipes or strainers have been placed. This chart shall be signed both by the contractor and the Engineer-in-Charge. This chart will also show the positions of joints in well assembly, the contractor will be entitled to payment for the well assembly and/or its lowering only on his producing this chart along with his bill.

10. Development :- (a) the contractor shall develop the well with his own equipment by such as would extract maximum practical quantity of sand, drilling and unwanted fine material in order to bring the well to maximum yield per m of draw down and to sand free condition. Compressed air, surge block or pump may be used for development work.

This work must be done in a manner that does not cause undue settlement and disturbances of the strata's above the water bearing formation.

- (b) The well shall be developed either by surging and agitating or by over pumping and backwashing with an airlift and high velocity jetting, etc. Any other acceptable method may also be adopted. This development process shall be continued until the stabilisation of sand and gravel pack has taken place.

The development of the tube-well by over-pumping should be done at 15% to 25% higher discharge than the expected discharge from the tube-wells. The final discharge should be free from sand with a maximum tolerance of 20 parts of sand in one million parts of water by volume after 20 minutes of starting the pump.

- (c) The development shall be carried out for the period as may be decided by the Engineer-in-Charge and will be so certified both by the Engineer-in-Charge and by the contractor after the development is completed.

Development of tube-well is the process by which unwanted fine particles of sand are removed from aquifer. By doing so better permeable layers of the aquifer are created around the tube-well screen or slotted pipes. Development ensures greater efficiency and long life to the tube-wells.

Methods of Development as Specified-

- (i) Development by over pumping-The simplest and the most common method of removing fines where a well ends in sand or gravel is by over pumping. It means pumping the well at a higher capacity than it will be pumped when in regular service it is quite convincing if a well can stand a discharge of 2280 LPM during over pumping will naturally stand a discharge of 1380 LPM in regular service and will provide water free of sand. But there are three main objections to this method of development:-
 - (a) Over pumping will not generally develop maximum efficiency in the wells.
 - (b) It tends to cause sand to "Bridging Action" in addition to clogging of the gravel pack if used.
 - (c) It often requires use of large pumping equipment than conveniently available.

By over pumping a tubular flow is created in the formation, fines are removed with greater speed but it does not assure greater permeability as can be achieved by other methods. Thus so called maximum efficiency is not obtained.

"Bridging" of sand in water bearing formations is a very important factor. When the water is pumped out of the well, there is a tendency to move the sand in the direction of the well end, with a steady pull in one direction, the finer sand grains wedge against each other and bridge across the openings between coarser grains of the gravel pack of the screen. The only way to avoid bridging is to provide agitation in movement of water.

Wells with small yields can easily be developed by over pumping but where a large quantity of water is required to be pumped, over pumping is not practicable.

- (ii) Development with compressed air: - There are two general methods of applying compressed air for the development of wells (a) Back washing method and (b) Open wells, or surging and pumping method.

The principle of back washing with compressed air is to force the water of the well through the screen, into the water bearing formation. The air is introduced into the well through the top of the casing after it has been closed. In order to prevent the possibility of air locking the formation, provision has to be made to prevent the air from entering into the formation. This can be achieved by terminating the drop pipe above the well screen.

A point of relief is also provided for the air introduced into casing back washing.

The principle of this method is a combination of surging and pumping by means of sudden release of large volumes of air a strong surge is produced by virtue of the resistance of water head friction and inertia. Pumping is done with an ordinary air lift pump. This is most popular and suitable method of development used by many drillers. To do the job, an air lift is done with the air pipe provided inside an educator pipe (pumping pipe) in the well. The equipment needed for this method includes the following:-

- (a) Air compressor and air tank.
- (b) Pumping pipe and air line in the well, with means for raising and lowering each independently of the other.
- (c) Flexible, high pressure, air hose to permit rising and lowering of the air line in the well.
- (d) Pressure gauge and relief valve to safe guard against accidental loading.
- (e) Quick opening valve in the outlet of the air tank for controlling air flow. The outlet of the compressor should be connected to the air tank in a way which will minimise resistance to air flow. The outlet pipe leading from the tank to the well should be larger than air line in the well.

The drop or pumping pipe is handled by the drilling line while the air line is handled separately by another line.

The table below gives the recommended sizes of pumping or educator drop pipe and air line to be used for various sizes of wells.

TABLE

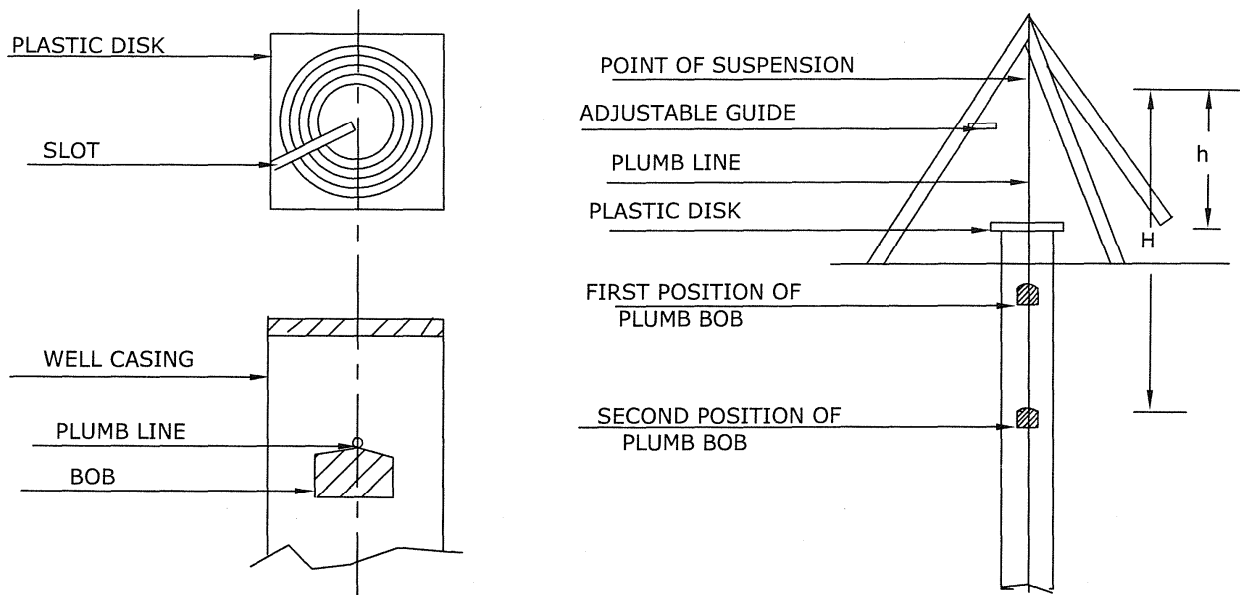
Pumping In LPM	Size of well Casing in Cm	Size of pumping Pipe in Cm	Size of air line in Cm
113-226	10	5	1.25
226-302	12.5	7.5	2.50
302.378	15	8.25 to 10	2.50
378.567	15	10	3.75
567-945	20	12.5	3.75
945-1512	20	15	5.00

Air development produces best results, when the submergence ratio of the air line is about 60% submergence ratio is the ratio of the total length of air line to the air pipe below the water while pumping, that is pumping level. if for example, the air line is 55 m long and the

static water level is 19 m below ground, the submerged length is 36m. therefore non-pumping submergence ratio is $19/55 = 0.65$ or 65% if the air lift is started and water level drops to 23 m below ground the submerged length becomes 32 m and the submergence ratio while pumping will be $23/55 = 0.42$ or 42%.

Reasonably good results can be obtained by a skilful operator with submergence as low as 30% while pumping.

Figure for note C(d) on page no. 321



In using air for development the drop pipe is lowered about 0.6 m below bottom of the well. The air line is placed such that it is 0.3 or 0.6 m up in the drop pipe. The compressed air is turned into the air line and the well is pumped in a regular manner of an air lift until water appears to be free of sand. The valve on the air line is then closed, allowing the pressure in the tank to build up to 7 or 10.5 kg/sq. cm. In the meantime the air line is lowered so that it is 30 cm or so below the drop pipe. The valve is then opened quickly allowing the air to rush into the well under full pressure.

There will be a forceful surge of water though brief and if the air line is then pulled back into the drop pipe the strong reverse flow will be produced, up the drop pipe thereby effectively agitating the water bearing formation.

The well is then pumped as an air lift for a short time, and another head of air is released with the air line below the drop pipe and the air line is again lifted to

resume pumping. The cycle of surging and pumping is continued, until the water is free from sand indicating that development is completed in the region near the bottom of the air lift.

The air lift assembly is then raised to a position about 30 cm higher and the same surging operations are repeated. In this way the entire length of the screen is developed. At the end the assembly should finally be lowered to its original position near the bottom of the well and operated in order to clean out any sand that has accumulated at the bottom levels.

Limitation of method:

When used correctly under proper conditions and with adequate equipment, this method of development is very effective and rapid. There is a little chance of development being over done but where the yield is very low and draws down is rapid, or where submergence is low, the compressor method is of on use and should resort to over pumping method.

11. Yield Tests. (a) The yield test of the tube well shall be carried out by pumping out well water, after the well is satisfactorily developed. Pumping rate shall be increased gradually until the desired draw down is attained. After this the test shall be continued at the same draw down for 10 hours. The duration shall be increased suitably and up to 12 hours at the specific direction of the Engineer-in-Charge. During this period the contractor will be required to collect, at his own cost, the sample of water coming out of the well in 2 litre capacity polyethylene bottles, for chemical and other analysis. The contractor will be required to handover to the Engineer-in-Charge one such sample for every well drilled. After the test, a certificate will have to be signed by both the contractor and the authorised representatives of the Engineer-in-Charge about the yield of the well at the specified draw down.
 - (b) Designed discharge will be anticipated yield indicated in the design of the well. Minimum yield of 378 LPM and 189 LPM have been specified at 6 m and 12 m specified standard draw down respectively for the alluvial and rock areas.
12. Unsuccessful wells.- The tube wells which do not give the minimum yield at the specified standard draw down will be declared by the Engineer-in-Charge as unsuccessful wells and a certificate to this effect will be obtained by the contractor from the Engineer-in-Charge. In such cases the contractor will be required to pull out the well assembly by jacking or by any other method that will be approved by the Engineer-in-Charge. In this process, care should be taken by the contractor to see that no part of the well assembly becomes irremovable or becomes unfit for further use, All assembly pulled out shall be immediately measured both by the contractor and the authorised representative of the Engineer-in-Charge. This assembly after the approval of Engineer-in-Charge may be used on other successful wells, of the contractor.
13. Abandoned wells - A well declared as abandoned by the Engineer-in-Charge due to non-verticality, caving in or any other defects attributable to the poor workmanship of the contractor, unsuitability of his equipment shall be termed abandoned well. No payment for this shall be due to the contractor. In such a case, the well assembly if lowered (complete or incomplete) will have to be pulled out and retrieved by the contractor at his own cost.

14. Erection of Pump and Accessories. – The contractor shall install in the tubewell suitable pump and motor and their accessories as may be supplied from sub-divisional stores by the Engineer-in-Charge. The store will have to be lifted from sub-divisional stores by the contractor, labour charges only will be paid for erection work. Contractor shall very carefully and diligently do the work of erecting all the components in the pump assembly such as:-

- (1) Pump.
- (2) Motor.
- (3) Column pipe, delivery pipes, bends, valves etc.
- (4) Electric water level guard with signal cable and electrode.
- (5) Air line.
- (6) Water level gauge.
- (7) Pressure gauge.
- (8) Irrigation panel.

The column pipes should be truly vertical without any kinks and securely jointed so as to preclude any chances of pump failing and resulting in the well being declared as abandoned in case of the pump cannot be retrieved.

15. Fishing operation – If during any of the operations carried out for completing the tubewells, any tools, pipes, accessories etc. fall down in the well the contractor shall carry out the necessary fishing operations at his own cost in such a way as not to damage the fallen part in any manner. He shall use his own equipment for such operations.

16. Back filling of Abandoned or Unsuccessful wells.- All abandoned or unsuccessful wells, from which well assembly has been extracted shall be suitably back filled with the natural material of the formations encountered, and duly rammed at ground level with allowances for settlement so as not to cause injury or accidents to people or cattle. The back filling for the abandoned well will be at the contractor's cost.

17. The following Indian Standards may be referred to:-

I. S. No.	Title
1239(Pt.-I)-2004 2800	Specification for mild steel tubes, tubulars and other wrought steel fittings, (part-1 Mild steel tubes) sixth revision) . Code of practice for construction and testing of tube wells.
2800(Pt.-I)-1991	Tube well Construction (II revision) (Reaffirmed 2001).
2800(Pt.-II)-1979 3043-1987	Tube well Testing (first revision) (Reaffirmed 1999). Code of practice for earthing(with amendments 1 to 5) Re2006
4097-1988	Gravel for use as pack in tube wells (reaffirmed-1999).
4270-2001	Steel tubes used for water wells (III revision).
4412-1981	Copper wires for general engineering purpose (Reaffirmed 2006).
5120-1977	Technical requirements for rotodynamic special purpose pumps. (Reaffirmed 2001).
5494-1969	Leaded brass sheets and strips for use in the manufacture of tube well stainers.
7156-1974	General requirements for reverse circulation drillings rigs (Reaffirmed 2001)
7206-1986	General requirements for straight rotary drillings rigs (Reaffirmed 2001)
7209-1974	General requirements for blast hole drillings rigs (Reaffirmed 2001)
8110-2000 9439-2002	Well screens and slotted pipes (II revision) (Reaffirmed 2006). Glossary of terms used in water-well drilling technology (Ist revision).

Item No.	Item	Unit	Rate	Remarks
4101	Drilling of 200 mm dia bore by reverse rotary or any other method in alluvium or overburdens (clay, sand, gravel, pebbles and boulders). Depth 0 to 70 m	m	545.00	
4102	Drilling of 250 mm dia bore by reverse Rotary or any other method in alluvium or overburden (clay, sand, gravel, pebbles and boulders). Depth 0 to 70 m.	m	616.00	
4103	Drilling of 300 mm dia bore by reverse rotary or any other method in alluvium or overburdens (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	741.00	
	(b) Beyond 70m and up to 150m depth	m	786.00	

Item No.	Item	Unit	Rate	Remarks
4104	Drilling of 375 mm dia bore by reverse rotary or any other method in alluvium or overburdens (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	824.00	
	(b) Beyond 70m and up to 150m depth	m	869.00	
4105	Drilling of 400 mm dia bore by reverse rotary or any other method in alluvium or overburden - (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	895.00	
	(b) Beyond 70m and up to 130m depth	m	929.00	
	(c) Beyond 130m and up to 190m depth	m	945.00	
4106	Drilling of 450 mm dia bore by reverse rotary or any other method in alluvium or overburden - (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	1013.00	
	(b) Beyond 70m and up to 130m depth	m	1030.00	
	(c) Beyond 130m and up to 190m depth	m	1064.00	
4107	Drilling of 500 mm dia bore by reverse rotary or any other method in alluvium or overburden - (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	1165.00	
	(b) Beyond 70m and up to 130m depth	m	1181.00	
	(c) Beyond 130m and up to 190m depth	m	1209.00	
4108	Drilling of 550 mm dia bore by reverse rotary or any other method in alluvium or overburden - (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	1286.00	
	(b) Beyond 70m and up to 130m depth	m	1350.00	
	(c) Beyond 130m and up to 190m depth	m	1384.00	
4109	Drilling of 600 mm dia bore by reverse rotary or any other method in alluvium or overburden - (clay, sand, gravel, pebbles and boulders).			
	(a) Depth 0 to 70 m.	m	1460.00	
	(b) Beyond 70m and up to 130m depth	m	1519.00	

Item No.	Item	Unit	Rate	Remarks
	(c) Beyond 130m and up to 190m depth	m	1536.00	
4110	(a) Drilling of 200 mm dia bore in rock of all types and hardness by DTH unit/direct rotary with rock rollers.	m	1291.00	
	(b) Drilling of 200mm dia bore in rock of all types and hardness by calyx machine.	m	1148.00	
4111	(a) Drilling of 150 mm dia bore in rock of all types and hardness by DTH unit/direct rotary with rock rollers.	m	1055.00	
	(b) Drilling of 150 mm dia bore in rock of all types and hardness by calyx machine.	m	929.00	
4112	Supplying and fixing of 100 mm dia E.R.W, MS pipes 4.85 mm thick conforming to medium grade of IS 1239 (Part I) with screwed ends with sockets.	m	753.00	
4113	Supplying and fixing in position 125 mm dia E.R.W, MS pipes 4.85 mm thick pipe conforming to medium grade of IS 1239 (Part I-) with screwed ends with sockets.	m	871.00	
4114	Supplying and fixing in position 150 mm dia E.R.W, MS pipes 4.85 mm thick conforming to medium grade of IS 1239 (Part I-) with screwed ends with sockets.	m	985.00	
4115	Supplying and fixing in position 150 mm dia E.R.W, MS pipes 5.4 mm thick conforming to grade of IS: 1239 (Part I) with screwed ends with sockets.	m	1148.00	
4116	Supplying and fixing in position 150 mm dia E.R.W, MS pipes 5.4 mm thick conforming to heavy grade of IS: 1239 (Part I) with welded joints (welded on spot)	m	951.00	
4117	Supplying and fixing in position 200 mm dia E.R.W, MS pipes 8 mm thick conforming to IS: 4270 with screwed ends and sockets.	m	2030.00	
4118	Supplying and fixing in position 250 mm dia E.R.W, MS pipes 9.5 mm thick conforming to IS: 4270 with screwed ends with sockets.	m	2371.00	

Item No.	Item	Unit	Rate	Remarks
4119	Supplying and fixing in position 300 mm dia E.R.W, MS pipes 9.5 mm thick conforming to IS: 4270 with screwed ends and sockets.	m	2759.00	
4120	Supplying and fixing in position 350 mm dia E.R.W, MS pipes 9.5 mm thick conforming to IS: 4270 with screwed ends and sockets.	m	3203.00	
4121	Supply and fixing of 100 mm dia E.R.W, MS slotted pipes 4.5 mm thick pipes conforming to medium grade of IS: 1239 (Part I) with slots of approved pattern (opening between 15% to 22 %).			
	(a) 3.2 mm slot	m	780.00	
	(b) 1.6 mm slot	m	1055.00	
4122	Supplying and fixing of 125 mm dia ERW, MS slotted pipes 4.85 mm thick (pipes conforming to medium grade of IS: 1239 (Part I) with slots of approved pattern-			
	(a) 3.2 mm slot	m	1064.00	
	(b) 1.6 mm slot	m	1199.00	
4123	Supplying and fixing of 150 mm dia ERW, MS slotted pipes 4.85 mm thick (pipes conforming to medium grade of IS: 1239 (Part I) with slots of approved pattern-			
	(a) 3.2 mm slot	m	1215.00	
	(b) 1.6 mm slot	m	1306.00	
4124	Supplying and fixing of 200 mm dia ERW, MS slotted pipes 8 mm thick (pipes conforming to IS: 4270 with slots of approved pattern-			
	(a) 5 mm slot	m	2373.00	
	(b) 3.2 mm slot	m	2474.00	
	(c) 1.6 mm slot	m	2589.00	
4125	Supplying and fixing 250 mm dia ERW, MS slotted pipes 9.5 mm thick (pipe conforming to IS: 4270 with slots of approved pattern-			
	(a) 5 mm slot	m	2719.00	
	(b) 3.2 mm slot	m	2819.00	
	(c) 1.6 mm slot	m	2903.00	

Item No.	Item	Unit	Rate	Remarks
4126	Supplying and fixing of 300 mm dia ERW, MS slotted pipes 9.5 mm thick (pipes conforming to IS: 4270 with slots of approved pattern-			
	(a) 5 mm slot	m	2983.00	
	(b) 3.2 mm slot	m	3046.00	
	(c) 1.6 mm slot	m	3145.00	
4127	Supplying and fixing 350 mm dia ERW, MS slotted pipes 9.5 mm thick (pipes conforming to IS: 4270 with slots of approved pattern-			
	(a) 5 mm slot	m	3385.00	
	(b) 3.2 mm slot	m	3460.00	
	(c) 1.6 mm slot	m	3540.00	
4128	Supplying and fixing slotted pipes with pre packed gravel filters of approved specifications-			
	(a) 150 mm dia	m	1693.00	
	(b) 200 mm dia	m	2373.00	
4129	Supplying and fixing of cage type wire wound strainer of approved specifications-			
	(a) 150 mm dia	m	2715.00	
	(b) 200 mm dia	m	3038.00	
4130	Supplying and fixing brass strainers of approved specifications-			
	(a) 150 mm dia	m	3418.00	
	(b) 200 mm dia	m	4229.00	
4131	Supplying and fixing of mild steel reducers type I (socket welded) as per specifications of size-			
	(a) 100 mm x 150 mm (wall thickness 4.85 mm)	each	368.00	
	(b) 125 mm x 150 mm (do)	each	391.00	
	(c) 150 mm x 200 mm (wall thickness 8 mm)	each	694.00	
	(d) 200 mm x 250 mm (wall thickness 9.5 mm)	each	1009.00	
	(e) 200 mm x 300 mm (do)	each	1075.00	

Item No.	Item	Unit	Rate	Remarks
	(f) 250 mm x 300 mm (do)	each	1119.00	
	(g) 300 mm x 350 mm (do)	each	1326.00	
4132	Supplying and fixing of mild steel reducers type II (natural) as per specifications of size-			
	(a) 100 mm x 150 mm	each	405.00	
	(b) 125 mm x 150 mm	each	444.00	
	(c) 150 mm x 200 mm	each	850.00	
	(d) 200 mm x 250 mm	each	1146.00	
	(e) 200 mm x 300 mm	each	1310.00	
	(f) 250 mm x 300 mm	each	1389.00	
	(g) 300 mm x 350 mm	each	1590.00	
4133	Supplying and fixing of central guide of approved specifications.	each	233.00	
4134	Supplying and fixing of bail plug type `A' as specified made with socket with bottom plate 12 mm thick and rod 20 mm dia welded as hock including labour charges for fixing-			
	(a) 100 mm dia	each	328.00	
	(b) 125 mm dia	each	411.00	
	(c) 150 mm dia	each	493.00	
	(d) 200 mm dia	each	659.00	
	(e) 250 mm dia	each	828.00	
	(f) 300 mm dia	each	993.00	
4135	Supplying and fixing of bail plug of type `B' as specified made from 75 cm long blind pipe extra attached to ballies plug type `A' as in item 4134 above including labour charges for fixing-			
	(a) 100 mm dia	each	671.00	
	(b) 125 mm dia	each	820.00	
	(c) 150mm dia	each	1009.00	
	(d) 200 mm dia	each	1703.00	
	(e) 250 mm dia	each	2016.00	
	(f) 300 mm dia	each	2359.00	

Item No.	Item	Unit	Rate	Remarks
4136	Supplying and fixing of well cap of approved specification including labour charges for fixing etc., complete-			
	(a) 150 mm dia	each	390.00	
	(b) 200 mm dia	each	516.00	
	(c) 250 mm dia	each	659.00	
	(d) 300 mm dia	each	780.00	
	(e) 350 mm dia	each	901.00	
4137	Conducing vertically test by plastic disc method as per IS: 2860 (Pt-II) of 1979.	per tubewell	796.00	
4138	(a) Collection of gravel (hard, insoluble and roughly rounded) from specified source including screening-			
	(i) 3.35 to 4.75 mm size	cum	486.00	
	(ii) 4.75 to 6.30 mm size	cum	466.00	
	(iii) 6.30 to 8.00 mm size	cum	443.00	
	(b) Packing of gravel in tubewell as specifications-	cum	133.00	
4139	(a) Development charges by compressor-			
	(i) with 7 cum/M	per hour	621.00	
	(ii) with 9 cum/M	per hour	746.00	
	(iii) above 9 cum/M	per hour	929.00	
	(b) Development by over pumping	per hour	621.00	
4140	Yield test by pumping-			
	(a) up to 0.03 cumec	per hour	655.00	
	(b) More than 0.03 cumec and upto 0.06 cmuec.	per hour	884.00	
	(c) More than 0.06 cumec	per hour	1043.00	
4141	Labour charges for pulling out the well assembly from unsuccessful and abandoned tube wells-			
	(a) 100 mm to 200 mm dia.	m	190.00	
	(b) above 200 mm dia.	m	218.00	

Item No.	Item	Unit	Rate	Remarks
4142	Labour charges for installation of Pump in the tubewell, including transportation of pipes, pumps, column pipes, etc.-			
	(a) Electrical submersible pump	each	1691.00	
	(b) Turbine pump electrically driven	each	3254.00	
	(c) Turbine pump Diesel driven with foundation etc., completes.	each	5531.00	
4143	Labour charges for lowering of assembly, fixing in position with central guides & reducers, wherever required including, cleaning of threads of sockets, fixing bail plug & well cap & welding to avoid accidental slipping of threads at socket joints-			
	(a) 100 mm to 200 mm dia.	m	126.00	
	(b) above 200 mm dia.	m	144.00	
4144	Fixing centrifugal pump electrically driven.	each	1263.00	
4145	Taking out pump from the tube well for repairs and maintenance.	each	2541.00	
4146	Providing of submersible pump for 150 mm dia. bore with all material suitable as per pump, pump / motor, Delivery pipe, control panel, M.S. clamp, wooded panel board, Ammeter, Volt meter, cable jointing kit, G.I. bend, earthing kit and all Misc. item for installation of pump and Motor.			
	(a) 250 LPM/40 meter Head	each	42250.00	
	(b) 450 LPM/30 meter Head	each	47875.00	
	(c) 500 LPM/30 meter Head	each	53750.00	

CHAPTER 42-FIELD TESTING AND MATERIAL TESTING

1. (a) Each representative sample shall be distinctly marked for identification and securely packed to avoid damage or loss of fines during transit. The outside cover should bear proper seal or name of sender as well as that of the receiving research formation. A tin sheet giving all details of the sample should also be kept inside the sample.

(b) Specifications for sampling of undisturbed soil samples should be rigidly followed. Utmost care by way of wax sealing and safe transit must be taken to see that the in-situ conditions are not changed until the samples are received in the laboratory.

(c) No charge will be borne by the laboratory for the samples supplied or their freight up to the laboratory.

(d) The quantities of samples to be supplied have to be intimated separately.
2. A detailed report with drawings indicating the necessity of testing with details of project should accompany the samples to enable the laboratory officers to decide on the mode of testing after understanding the problem. The drawings for trial pits, borrow areas, logs of boring data, should be furnished with geological details, water table and other relevant information.
3. (a) The test on samples will be taken up on the basis of priority fixed by the officer incharge of the lab. If, any party desires to have test results by a definite date, they should officer in charge enquire in advance from the officer in charge as to whether the test results can be made available by those dates on special priority. However testing of cubes of concrete samples shall be invariably done on due date and test report sent within two days.

(b) The work for private parties or other than Water Resources Department will be taken up only with special permission of the officer in charge in each individual case, and special priority will normally not be allowed to them.
4. (a) On receipt of the request for testing, the officer in charge will send an estimated bill for testing charges as per U.S.R. The charges will be paid by the sponsoring authority in advance by bank draft. No test will be carried out until the receipt of these charges. Supplementary demand for advance payment of fees will also be made on basis of U.S.R., if in the course of testing, it is felt that the earlier amount of advance may be inadequate.

(b) For items, not included in this Schedule of Rates, separate rates will be quoted depending on the type of job involved.
5. Once the results are sent to the party concerned, request for rechecking of these results will only be done if the officer in charge feels it to be justified. Extra charges, if any fixed by the Director will have to be paid for such re-testing.
6. The testing will be carried out by the staff of the laboratory alone, and no other parties will be permitted to carry out the test.

7. For all tests, Indian Standard specifications would be followed where available. For other tests, specifications finalised by the officer in charge would be followed. Any clarification in the method of testing can be obtained from the officer in charge .
8. The staff of the W.R. Deptt. shall not be responsible for giving legal defence or for appearing in a court of law in connection with tests carried out by laboratories and no such request shall be entertained.
9. Officer in charge of laboratory the right to publish the result of any test without the permission of the party concerned.
10. The samples supplied for testing will be stored up to a period of 3 months after their reports are communicated to the party. After this period, they will be finally disposed off.
11. On matters of dispute and interpretations of any rules and results, the decision of the Director, Research will be final.
12. For field tests rates quoted include only the cost for testing. The transportation cost for equipments to site of work will be charged extra as per actual or may be arranged by the party for whom the work is undertaken.
13. The preparation of site, including excavation of pits, areas, scaffolding, dewatering, air supply, meter charges for electricity, drilling cost, water supply, fixing of anchor rods, concrete pedestals and foundations, supply of labour, tools and plants and all such other miscellaneous arrangements which are directly or indirectly connected with actual performance of field test will be the exclusive responsibility of the party. This should be arranged in advance in consultation with the officer in charge of lab.
14. Normal facilities like residential accommodation, conveyance etc. for the staff deputed for conducting the field tests will be provided by the party.
15. Rates given in this schedule are for works done for Water Resources Department, Chhattisgarh, 25% extra will be charged for work undertaken for other departments or private agencies.
16. The T.A. and D.A. charges for staff deputed for field tests plus 25% extra will be recoverable from private parties or other departments in addition to the scheduled rate for testing.
17. The rates are for departmental execution of work. Hence no deduction is to be made.
18. The following Indian Standards may be referred to :-

IS NO.	Title
460	Test sieves
460- (Pt. I) – 1985	Wire cloth test sieves (III revision) Reaffirmed 2004
460 - (Pt. II) – 1985	Perforated plate test sieves (III revision) Reaffirmed 2004
460 - (Pt. III) – 1985	Method of examination of test sieves (III revision) Reaffirmed 2006
456-2000	Code of practice for plain and Reinforced concrete. (III revision) Reaffirmed 2006

IS NO.	Title
516 – 2000	Methods of tests for strength of concrete (with amendment No.2). Reaffirmed 2004
650 – 1991	Standard sand for testing of cement (first revision) (with amendment No. I) (Reaffirmed 2004)
1121 -	Methods of test for determination of strength properties of natural building stones.
1121 (Pt. I) – 1974	Compressive strength (first revision) (with amendment No. 1).
1121 (Pt. Iv) – 1974	Shear strength (first revision)
1122 – 1974	Methods of test for determination of true specific gravity of natural building stones. (first revision)
1124 – 1974	Methods of test for determination of water absorption, apparent specific gravity and porosity of natural building stones (first revision)
1125 – 1974	Method of test for determination of weathering of natural building stones (first revision) Reaffirmed 2003
1126-1974	Method of test for determination of durability of natural building stones (first revision) Reaffirmed 2003
1199 – 1959	Methods of sampling and analysis of concrete.(Re 2004)
1498 – 1970	Classification and identification of soils for general engineering purposes (first revision). (Re 2002)
1727-1967	Methods of test for pozzolanic materials (first revision). (Re 2004)
1888-1982	Method of load test on soils (first revision). (Re 2002)
2386 -	Method of test for aggregates for concrete
2386 – (Pt. I) – 1963	Particle size and shape (Re 2007)
2386 – (Pt. II) – 1963	Estimate of deleterious materials and organic impurities. (Re 2007)
2386 – (Pt. III) – 1963	Specific gravity, density, voids, absorption and bulking.(Re 2007)
2386 – (Pt. Iv) – 1963	Mechanical properties (with amendment No. 1). (Re 2007)
2386 – (Pt. v) – 1963	Soundness (Re 2007)
2386 – (Pt. vi) – 1963	Measuring mortar making properties of fine aggregate. (Re 2007)
2386 – (Pt. vii) – 1963	Alkali aggregate reactivity
2430 – 1969	Methods for sampling of aggregate for concrete.
2720	Methods of test for soils -
2720 – (Pt. I) – 1983	Preparation of dry soils samples for various tests (first revision) (with amendment No. I). (Re 2006)
2720 – (Pt. II) – 1973	Determination of water content (second revision). (Re 2002)
2720 – (Pt. III) – 1980	Determination of specific gravity.
2720 – (Pt. III/Sec.1) – 1980	Section I-Fine grained soils (first revision) (Re 2002)
2720 – (Pt. III/Sec.2) – 1980	Section 2-Fine medium and coarse grained soils (first revision) (Re 2002)
2720 – (Pt. Iv) – 1985	Grain size analysis (II revision). (Re 2001)
2720 – (Pt. v) – 1985	Determination of liquid and plastic limits (first revision) (reaffirmed 2006).
2720 – (Pt. vi) – 1972	Determination of Shrinkage factors (first revision) (Re 2001)

IS NO.	Title
2720 (Pt. VII) –1980	Determination of water content, dry density relation using light compaction.(Re 2002)
2720 (Pt. VIII) –1983	Determination of water content, dry density relation using heavy compaction (III revision) (with amendment No.1) (Re 2006)
2720 (Pt. ix) –1992	Determination of dry density moisture content relation by constant weight or soil method (with amendment No.1) (reaffirmed – 2002) .
2720 (Pt. x) –1991	Determination of unconfined compressive strength (first revision). (Re 2006)
2720 (Pt. xi) –1993	Determination of the shear strength parameters of a specimen tested in unconsolidated undrained triaxial – compression without the measurement of pore water pressure (with amendment Nos. 1 and 2) (reaffirmed 2002).
2720 (Pt. xii) –1981	Determination of shear strength parameters of soil from consolidated undrained triaxial compression test with measurement of pore water pressure. (Re 2002)
2720 (Pt. xiii) –1986	Direct shear test (II revision). (Re 2002)
2720 (Pt. xv) –1965	Determination of consolidated properties (with amendment Nos.1 and 2) . (Re 2002)
2720 (Pt. xvi) –1987	Laboratory determination of C.B.R. (first revision).
2720 (Pt. xvii) –1986	Laboratory determination of permeability (with amendment Nos.1). II revision). (Re 2002)
2720 (Pt. xxi) –1977	Determination of total soluble solids (I revision) (Re 2006)
2720 (Pt. XIII) –1976	Determination of calcium carbonates (first revision).(Re 2006)
2720 (Pt. XXVI) 1983	Determination of PH values (II revision)(Re 2002)
2720 (Pt. XXIX) 1975	Determination of dry density of soils in-place by the core cutter method (first revision) (Re 2001)
2720 (Pt.XL) 1977	Determination of free swell index of soils (Re 2002)
2720 (Pt.XLI) 1977	Measurement of swelling pressure of soils . (Re 2002)
2809-1972	Glossary of items and symbols relating to soil engineering (first revision). (Re 2006)
3085-1965	Methods of test for permeability of cement mortar and concrete (reaffirmed 2007).
3495 (Pt. 1 to IV)-1992	Methods of tests of burnt clay building bricks (second revision) (with amendment No. 1). (Re 2002)
4031-1996	Methods of physical tests for hydraulic cement (Reaffirmed 2005).
4032-1985	Method of chemical analysis of hydraulic cement (Reaffirmed 2005).
4434-1978	Code of practice for in-situ vane shear test for soils (first revision). (Re 2002)
4464-1985	Code of practice for presentation of drilling Information and core description in foundation investigation. (Re 2000)
4968	Method for subsurface sounding for soils. (Re 2002)
4968 (Pt.II)-1976	Dynamic method using cone and bentonite slurry (first revision) (with amendment No. 1). (Re 2002)
4968 (Pt.III)-1976	Static cone penetration test (first revision) (Re 2002)

IS NO.	Title
5513-1996	Vicat apparatus (II revision) (Re 2005)
5514-1996	Apparatus used in Lechateller test. (Re 2005)
5529	Code of practice for in-situ permeability tests
5529(Pt.I_-1969	Tests in overburden
5529 (Pt.II)-1973	Test in bedrock
6632 (Pt. I to X) 1988	Methods of test for building limes. (Re 2002)
6632 (Pt.III)-1973	Determination of residue on slaking of quicklime. (Re 2000)
6932 (Pt.IV)-1973	Determination of fineness of hydrated lime. (Re 2000)
6932 (Pt.V)-1973	Determination of volume yield of quick lime. (Re 2000)
6932 (Pt.VII)-1973	Determination of compressive and transverse strength.(Re 2000)
6932 (Pt. VIII) 1973	Determination of workability. (Re 2000)
6932 (Pt. IX) 1973	Determination of soundness (Re 2000)
6932 (Pt. X) 1973	Determination of popping and pitting of hydrated lime. (Re 2000)
7320 – 1974	Concrete slump test apparatus (Re 2004)
7746 – 1991	Code of practice for in-situ shear test on rock (with amendment No. 1).
8763 – 1978	Guide for undisturbed sampling of sands. (Re 2002)
8764 – 1998	Method of determination of point load strength index of rocks.
9013 – 19780	Method of making curing and determining compressive strength of accelerated-cured concrete specimens. (Re 2004)
9143 – 1979	Method for the determination of unconfined compressive strength of rock materials. (Re 2006)
9179 – 1979	Method for preparation of rock specimen for laboratory testing. (Re 2006)
9259 – 1979	Liquid limit apparatus for soils (with amendment No. 1). (Re 2002)
9376 – 1979	Apparatus for measuring aggregate crushing value and ten percent fines value. (Re 2004)
9377 – 1979	Apparatus for aggregate impact value (Re 2004)
9399 – 1979	Apparatus for flexural testing of concrete. (Re 2004)
9399 – 1980	Apparatus for uses in measurement of length change of hardened cement paste, mortar and concrete.
9669 – 1980	CBR Moulds and its accessories.(Re 2002)
10050 – 1981	Slake durability index of rocks, method for determination. (Re 2006)
10740 – 1983	Operating requirement or power takeoff driven implements.
SP-23-1982	Hand book on concrete mix design (Based on Indian standard)
SP-36-1987(Part I)	Compendium of Indian standards on soil engineering (Laboratory Testing)
SP-23-1982(Part II)	Hand book on concrete mix design (Field Testing)

Item No.	Item	Unit	Rate	Remarks
1. Soil testing – (A) Laboratory test -				
4201	Grain size analysis (IS : 2720 Pt. IV)	per sample	598.00	
4202	Apparent specific gravity test (IS : 2720 Pt. III and Sec. – I and II of Pt. III).	per sample	259.00	
4203	Liquid, Plastic and Shrinkage limits (IS : 2720 Pt. V& VI)	per sample	443.00	
4204	Standard (light Compaction test/relative density test) (IS : 2720 Pt. VII & VIII)	per sample	596.00	
4205	Laboratory permeability test (IS: 2720 Pt. XVII).	per sample	1164.00	
4206	Effective shear parameters by consolidated undrained test by triaxial machine on 37.5 mm dia sample.	per sample	1950.00	
4207	Determination of in-situ moisture content and density of undisturbed sample (IS : 2720 Pt. XXIX) .	per sample	265.00	
4208	Shear parameters by quick saturated test (Qsat) by triaxial machine on undisturbed samples (IS: 2720 Pt. XI).	per sample	2002.00	
4209	Shear parameters by quick test on sample at OMC & MDD or NMC & NDD by triaxial machine on 37.5 mm dia sample (IS : 2720 Pt. XI).	per sample	1469.00	
4210	Box shear test (IS: 2720 Pt. XIII).	per sample		
	(a) At OMC & MDD	per sample	621.00	
	(b) On undisturbed sample	per sample	621.00	
4211	Consolidation test on disturbed or undisturbed samples (IS: 2720 Pt. XV).	per sample	805.00	
4212	California bearing ratio (IS: 2720 Pt. XVI).	per sample	811.00	
4213	Void ratio	per sample	283.00	
4214	Chemical tests on soils –			
	(a) Lime content test (IS: 2720 Pt. XXIII).	per sample	269.00	
	(b) Soluble salt test (IS: 2720 Pt. XXI).	per sample	227.00	

Item No.	Item	Unit	Rate	Remarks
	(c) PH value test	per sample	269.00	
4215	Chemical test for water suitability for Irrigation use.	per sample	618.00	
4216	Unconfined compression test on 37.5 mm dia sample (IS: 2720 Pt. X).	per sample	562.00	
4217	Swelling pressure test.			
	(a) Free swell (IS: 2720 Pt. XL).	Per sample	265.00	
	(b) Swelling pressure (IS: 2720 Pt. XLI).	Per sample	562.00	
4218	Bearing capacity of soil by triaxial shear test on soil sample.	per sample	2821.00	
(B) Field Tests -				
4219	Load bearing test on soil (IS : 1881)	per no.	6869.00	
4220	Field permeability test -			
	(A) Pumping in test (IS: 5529 Pt. I)	per no.	3056.00	
	(B) Pumping out test (IS : 5529 Pt. II)	per no.	4418.00	
4221	Vane shear test on soft fine grained soil (IS : 4434).	per no.	2153.00	
4222	(a) Static cone penetration test (IS : 4968 II & III)	per no.	3415.00	
	(b) In-situ shear test on rock (IS: 7746).	per no.	3401.00	
II. Material Testing -				
(A) Test on Lime				
4223	Fineness of Hydraulic Lime (IS : 6932 Pt. IV)	per sample	235.00	
4224	Workability test (IS : 6932 Pt. VIII)	per sample	273.00	
4225	Setting time	per sample	273.00	
4226	Soundness test (By Le-chatelier method) (IS : 6932 Pt. IX)	per sample	273.00	
4227	Compressive strength test (IS : 6932 Pt. VII)			
	(a) Preparing 12 specimen size (50 mm cubes)	per job	353.00	

Item No.	Item	Unit	Rate	Remarks
	(b) Testing of cubes 12 specimen	per job	131.00	
4228	Transverse strength test (IS: 6932 Pt. VII)			
	(a) Preparing six specimen	per job	328.00	
	(b) Testing 6 specimen	per job	120.00	
4229	Popping and pitting test (IS : 6932 Pt. X)	Per sample	603.00	
4230	Volume yield of quick lime (IS: 6932 Pt. VI)	per sample	366.00	
4231	Residue on slaking of quick lime (IS : 6932 Pt. III) .	per sample	273.00	
4232	Calcinations of lime of soil	per sample	892.00	
(B) Test on Cement :-				
4233	Fineness modulus test (IS : 4031).			
	(a) By sieving method	per sample	252.00	
	(b) By specific surface i.e. air permeability apparatus.	per sample	341.00	
4234	Consistency test (IS: 4031).	per sample	322.00	
4235	Test for setting time (IS: 4031).	per sample	385.00	
4236	Specific gravity test (IS: 4031).	per sample	252.00	
4237	Heat of Hydration test (IS: 4031).	per sample	887.00	
4238	Soundness test (IS : 4031)-			
	(a) By Le-chateller's method	per sample	273.00	
	(b) By Autoclave method	per sample	512.00	
4239	Tensile strength (IS : 4031)-			
	(a) Preparing 12 specimens and curing.	per job	426.00	
	(b) Testing 12 specimens	per job	120.00	
4240	Compressive strength of cement (IS: 4031)-			

Item No.	Item	Unit	Rate	Remarks
	(a) Preparing 6 specimens and curing.	per job	404.00	
	(b) Testing 6 specimens	per job	165.00	
4241	(C) Test on L.D.P. Film -			
	(a) Detemination of Density test	per job	169.00	
	(b) Detemination of Thickness test	per job	102.00	
	(c) Detemination of Tensile Strength & Elongation at break cross wise Direction test	per job	203.00	
	(d) Detemination of Tensile Strength & Elongation at break length wise Direction test	per job	203.00	
	(D) Test on aggregates including sand -			
4242	Sieve analysis (IS: 2386 Pt. I)-	per sample	275.00	
4243	Unit weight or bulk density (IS: 2386 Pt. III) -	per sample	209.00	
4244	Test for Organic impurities (IS: 2386 Pt. II)-	per sample	266.00	
4245	Absorption and specific gravity test (IS: 2386 Pt. III)-	per sample	515.00	
4246	Absorption of aggregates (IS: 2386 Pt. III)-	per sample	344.00	
4247	Test for finding out percentage of clay, fine slit and fine dust (IS: 2386 Pt. II)-	per sample	494.00	
4248	(a) Soundness test (10 cycles) (IS: 2386 Pt. V)-	per sample		
			2227.00	
	(b) Soundness test (5 cycles) (IS: 2386 Pt. V)-	per sample	1135.00	
4249	Aggregate impact test (IS: 2386 Pt. IV)-	per sample	275.00	
4250	Abrasion test by any of the following methods (IS: 2386 Pt. IV)-			
	(a) Deval attrition test machine	per sample	519.00	
	(b) By Los Angles machine	per sample	519.00	

Item No.	Item	Unit	Rate	Remarks
	(c) By Derry's Abrasion testing machine	per sample	519.00	
4251	Aggregate crushing value (IS: 2386 Pt. IV)-	per sample	621.00	
4252	Compressive strength of stone specimen (IS: 1121 Pt. I)-			
	(a) Cutting and dressing stone block of size 10x10x10 cm.	per sample	231.00	
	(b) Testing the above specimen	per sample	161.00	
4253	Determination of Coal. Lignite and shale in aggregates (IS: 2386 Pt. II)-	per sample	273.00	
4254	Alkali aggregate reactivity test as per ASTM (Reduction of Alkali silica release test) (IS: 2386 Pt. VII)-	per sample	848.00	
4255	Potential alkali aggregate reactivity test (IS: 2386 Pt. VII)-	per sample	1940.00	
(E) Test on concrete –				
4256	Compressive strength of cube of cube specimen of size 15 cm (IS: 516)-			
	(a) Preparing cubes including curing for specified time (minimum for 6 specimens).	per specimen	147.00	
	(b) Testing of one specimen	per No.	156.00	
4257	Compressive strength of cube specimen of 10 cm (IS: 516)-			
	(a) Preparing cube specimen of 10cm size including curing.	per No. (minimum Rs. 75)	121.00	
	(b) Testing specimen	Per No.	129.00	
4258	(a) Preparing cylindrical specimen of size 15 cm dia x30 cm height including curing (IS: 516)-	per no. (minimum Rs. 110)	155.00	
	(b) Testing cylindrical specimen	per No.	201.00	
4259	(a) Preparing cylindrical specimen of size 10 cm dia x20 cm height including curing (IS: 516) -	per No. (minimum Rs. 80)	107.00	
	(b) Testing cylindrical specimen	per No.	125.00	

Item No.	Item	Unit	Rate	Remarks
4260	Flexural strength -			
	(a) Preparing concrete beam of size 10x10x50 cm.	per No. (minimum Rs. 75)	121.00	
	(b) Testing specimen	per No.	103..00	
4261	(a) Compressive strength test for concrete block	per No.	146.00	minimum three blocks will be tested
	(b) Non destructive test of concrete by pulse velocity meter min. no. of specimen three no.	per No.	1292.00	
	(c) Non destructive test of concrete by rebound hammer min. no. of specimen three no..	per No.	685.00	
4262	Determination of cement content in hardened concrete -			
	(a) By lime and calcium oxide determination process.	per sample	994.00	
	(b) By silica process SiO ₂ determination (IS: 1199).	per sample	994.00	
4263	Determination of permeability of concrete (IS: 3085).	per sample	366.00	minimum three blocks will be tested
4264	Slump test	per sample	316.00	Including mixing concrete.
(F) Test on Bricks -				
4265	Water absorption) of burnt clay bricks (five specimens) –	per job	706.00	
4266	Compressive strength of bricks (IS : 3495) -			
	(A) Five Nos.	per job	331.00	
	(B) One No.	per sample	78.00	
4267	Determination of effelorence (IS : 3495) -			
	(A) Five Nos.	per job	331.00	
	(B) One No.	per sample	105.00	

Item No.	Item	Unit	Rate	Remarks
4268	Flexural strength	Per No.	142.00	
4269	Specific gravity	per sample	230.00	
4270	Unit weight	per sample	230.00	
(G) Surkhi and other Miscellaneous Testing -				
4271	Lime reactivity test (IS : 1727) - (a) Preparing 50 sq cm specimen (6 Nos.)	per job	1971.00	
	(b) Testing of the above specimens	per job	1971.00	
4272	Finding out of the optimum temperature of buming of clay and the optimum fineness of surkhi preparing and testing of 15 Nos. of lime surkhi mortar cubes of size 50 sq. cm (for fineness and temperature) (IS : 1727) -	per job	6613.00	
4273	Finding out the optimum fineness of ready surkhi by preparing and testing of 15 Nos. of lime surkhi mortar cubes of size 50 sq. cm (IS : 1727)	per job	1501.00	
4274	Compressive strength of lime surkhi and cement surkhi mortar cubes 50 sq. cm (IS : 1727) - (a) Preparing 12 cubes of size 50 sq. cm.	per job	1126.00	
	(b) Testing of above specimen (6 Nos.)	per job	481.00	
4275	Chemical analysis of cement/lime or surkhi samples (IS : 4032) –	per job	880.00	
(H) Tests on Natural Building Stone -				
4276	Compressive strength test (IS: 1121 Pt. I) (a) Preparing specimen	per job	322.00	
	(b) Testing above specimen	per job	113.00	
4277	Shear strength test (IS: 1121 Pt. IV)- (a) Preparing specimen	per job	315.00	
	(b) Testing above specimen	per job	162.00	
4278	Specific gravity and porosity test (3 specimens) (IS : 1122) –	per job	522.00	
4279	Water absorption test (24 hour immersion and five hour boiling test)-			

Item No.	Item	Unit	Rate	Remarks
	(a) Preparing specimen	per specimen	147.00	
	(b) Testing specimen	per specimen	147.00	
4280	Durability test (IS: 1126) -			
	(a) Preparing specimen	per specimen	147.00	
	(b) Testing the specimen	per specimen	1174.00	
4281	Weathering test (IS : 1125) -			
	(a) Preparing specimen	per specimen	344.00	
	(b) Testing the specimen	per specimen	1496.00	
4282	Abrasion test -			
	(a) Preparing specimen	per job	279.00	
	(b) Testing specimen	per job	344.00	
4283	Compressive strength on cores (IS: 1 121 Pt. I) -			
	(a) Cores received, cut and polished	per specimen	235.00	
	(b) Cores drilled, cut and polished	per specimen	423.00	
	(c) Testing the specimen	per specimen	171.00	
4284	Cubes received, Capped and tested.	per specimen	189.00	
(I) Tests on Tiles –				
4285	(a) Water absorption test per sample	per specimen	187.00	
	(b) Determination of Flexural strength	per specimen	83.00	
	(c) Resistance of wear	per specimen	120.00	
	(d) Impact test	per specimen	213.00	
	(e) Permeability of tiles	per specimen	241.00	

Item No.	Item	Unit	Rate	Remarks
(J) Tests on Soil Cement Blocks –				
4286	(a) Moisture absorption tests group of five.	per job	508.00	
	(b) Compressive strength test	per sample	120.00	
	(c) Weathering test	per sample	1168.00	

QUANTITIES OF MATERIALS FOR COMPLETED ITEMS OF WORK

Notes :-

1. For items of works, which are not listed in this Appendix, actual quantities should be worked out as mode of measurements specified in schedule of rates.

S. No.	Item	Unit	Material	Quantities of materials	Remark
1	Hard moorum filling	cum	Moorum	1.00 cum	
2	Rammed sand filling	cum	Sand	1.00 cum	
3	Rammed moorum & bolder	cum	Moorum	0.40 cum	
			Bolder	1.00 cum	
4	Rammed moorum and metal (or shingle or gravel).	cum	Moorum	0.33 cum	
			Metal	1.00 cum	
5	Cement mortar 1:2	cum	Cement	0.50 cum	
			Sand	1.00 cum	
6	Cement mortar 1:3	cum	Cement	0.33 cum	
			Sand	1.00 cum	
7	Cement mortar 1:4	cum	Cement	0.25 cum	
			Sand	1.00 cum	
8	Cement mortar 1:5	cum	Cement	0.20 cum	
			Sand	1.00 cum	
9	Cement mortar 1:6	cum	Cement	0.16 cum	
			Sand	1.00 cum	
10	Cement mortar 1:8	cum	Cement	0.12 cum	
			Sand	1.00 cum	
11	(a) Plum cement concrete 1:2:4 with 25% plums.	cum	Plum	0.21 cum	
			Metal	0.64 cum	
			Cement	0.16 cum	
			Sand	0.32 cum	
	(b)Plum cement concrete 1:3:6 with 25% plums.	cum	Plum	0.22 cum	
			Metal	0.68 cum	
			Cement	0.11 cum	
			Sand	0.34 cum	
	(c)Plum cement concrete 1:4:8 with 25% plums.	cum	Plum	0.23 cum	
			Metal	0.69 cum	
			Cement	0.09 cum	
			Sand	0.35cum	
12	Cement concrete 1:1:2	cum	Metal	0.77 cum	
			Cement	0.40 cum	
			Sand	0.38cum	

S. No.	Item	Unit	Material	Quantities of materials	Remark
13	Cement concrete 1:1.5:3	cum	Metal	0.82 cum	
			Cement	0.283 cum	
			Sand	0.41cum	
14	Cement concrete 1:2:4	cum	Metal	0.85 cum	
			Cement	0.22 cum	
			Sand	0.43cum	
15	Cement concrete 1:3:6	cum	Metal	0.90 cum	
			Cement	0.154 cum	
			Sand	0.45cum	
16	Cement concrete 1:4:8	cum	Metal	0.92 cum	
			Cement	0.12 cum	
			Sand	0.46cum	
17	Cement concrete 1:5:8	cum	Metal	0.85 cum	
			Cement	0.11cum	
			Sand	0.53cum	
18	Cement concrete 1:5:10	cum	Metal	0.94 cum	
			Cement	0.09 cum	
			Sand	0.47cum	
19	Cement concrete 1:6:12	cum	Metal	0.94 cum	
			Cement	0.08 cum	
			Sand	0.47 cum	
20	Brick bat filling	cum	Brick bats	1.00 cum	
21	Metal filling	cum	Metal	1.00 cum	
22	Plain Ashlar masonry/Ashlar Rough tooled masonry/Ashlar rock (quarried) faced masonry	cum	Masonry stone	1.00 cum	
			Mortar	0.12 cum	
23	Squared rubble masonry (first sort) / Squared rubble masonry (second sort)/ hammer dressed coursed rubble masonry/Face stone masonry.	cum	Rubble	0.84 cum	
			Masonry Stone (Bond Stone)	0.16 cum	
			Mortar	0.35 cum	
24	Dry random rubble masonry	cum	Rubble	1.00 cum	
25	Uncoursed or Random Rubble masonry	cum	Rubble	0.84 cum	
			Masonry Stone	0.16 cum	
			Mortar	0.42 cum	
26	Fixing fine dressed cut stone lintels in mortar	cum	Cut stone	1.00 cum	
			Mortar	0.03 cum	
27	Fixing fine dressed cut stone Copings, comices, string courses and plinth coursed in mortar.	cum	Cut stone	1.00 cum	
			Mortar	0.12 cum	

S. No.	Item	Unit	Material	Quantities of materials	Remark
28	Stone block masonry with solid stone masonry block precast in c. c. 1:4:8	cum	Precast blocks	0.90 cum	
			Mortar	0.12 cum	
29	Sun dried brick masonry	cum	Bricks	1.00 cum	
			Mortar	0.25 cum	
30	Burnt brick masonry	cum	Bricks	1.00 cum	
			Mortar	0.21 cum	
31	Honey comb brick masonry	cum	Bricks	0.72 cum	
			Mortar	0.05 cum	
32	Flag stone flooring over 20 mm thick bedding of CM 1:6 including pointing in CM : 1:3	sqm	Flag stone	1.10 cum	
			CM 1:6	0.0224 cum	
			CM 1:3	0.0026 cum	
33	Grouted stone pitching	cum	Pitching stone	1.00 cum	
			Mortar	0.20 cum	
34	Dry stone pitching	cum	Pitching stone	1.00 cum	
35	Dry Boulder pitching	cum	Boulder	1.00 cum	
36	75 mm thick improved terrace flooring in cement concrete with neat cement floating coat.	sqm	C.C.	0.075 cum	
			Cement (for Finishing and slurry)	0.003 cum	
37	40 mm thick improved terrace flooring in cement concrete with neat cement floating coat.	sqm	C.C.	0.04 cum	
			Cement (for Finishing and slurry)	0.003 cum	
38	15 mm thick lime plaster on brick masonry with neeru finish.	sqm	L.M.	0.025 cum	
			White wash	0.003 cum	
			Lime		
39	20 mm thick lime plaster on brick masonry with neeru finish.	sqm	L.M.	0.025 cum	
			White wash	0.003 cum	
			Lime		
40	Cement plaster on stone work-				
	(a) 20 mm thick	sqm	C.M.	0.025 cum	
	(b) 25 mm thick	sqm	C.M.	0.028 cum	
41	6 mm thick cement plaster to ceiling	sqm	C.M.	0.0072 cum	
42	Cement plaster on brick work-				
	(a) 10 mm thick	sqm	C.M.	0.012 cum	
	(b) 15 mm thick	sqm	C.M.	0.018 cum	
	(c) 20 mm thick	sqm	C.M.	0.022 cum	

S. No.	Item	Unit	Material	Quantities of materials	Remark
43	Rough cast Cement plaster-				
	(a) 15 mm thick	sqm	C.M.	0.02 cum	
	(b) 20 mm thick	sqm	C.M.	0.022 cum	
44	Cement for floating coat of neat cement over plaster.	sqm	Cement	2.20 kg	
45	Pebble dash plaster as per item 1124	sqm	C.M.	0.023 cum	
			6 to 12 mm pebbles or crushed stone	0.01 cum	
46	Pointing of brick work-				
	(a) Flush pointing	sqm	Mortar	0.003 cum	
	(b) Ruled pointing	sqm	Mortar	0.003 cum	
	(c) Raised and cut pointing	sqm	Mortar	0.0046 cum	
47	Pointing of brick work				
	(a) Flush pointing	sqm	Mortar	0.0023 cum	
	(b) Ruled pointing	sqm	Mortar	0.0023 cum	
	(c) Raised and cut pointing	sqm	Mortar	0.0038 cum	
48	Cement pointing to flage stone flooring	sqm	C.M.	0.0026 cum	
49	Mangalore tile roofing	sqm	Tiles	15 Nos	
50	A. C. sheets roofing	sqm	AC sheet	1.07 sqm	
51	White washing with lime				
	(a) One coat	sqm	Quick lime	0.1 kg	
			Indigo	0.3 gm	
			Gum	2 gm	
			Sodium Chloride	0.3 gm	
	(b) Two coat	sqm	Quick lime	0.2 kg	
			Indigo	0.6 gm	
			Gum	4 gm	
			Sodium Chloride	0.6 gm	
	(c) Three coat	sqm	Quick lime	0.3 kg	
			Indigo	0.9 gm	
			Gum	6 gm	
			Sodium Chloride	0.9 gm	
52	Cement wash with portland cement slurry	sqm	Cement	0.107 kg	

S. No.	Item	Unit	Material	Quantities of materials	Remark
53	White washing with Chalk whiting- (i) One coat	sqm	Chalk	0.1 kg	
			Indigo	0.3 gm	
			Gum	2 gm	
	(ii) Two coats	sqm	Copper sulphate	0.3 gm	
			Chalk	0.2 kg	
			Indigo	0.6 gm	
			Gum	4 gm	
	(iii) Three coats	sqm	Copper sulphate	0.4 gm	
			Chalk	0.3 kg	
Indigo			0.9 gm		
Gum			6 gm		
54	Distempering with dry distemper- (a) One coat excluding priming Coat of whiting	sqm	Dry distemper	0.06 kg	
			Whiting chalk	0.1kg	
	(b) Two coats including priming Coat of whiting	sqm	Dry distemper	0.1 kg	
			Glue	4.0 gm	
	(c) Two coats excluding priming coat	sqm	Dry distemper	0.1 kg	
55	Distempering with oil bound washable distemper- (a) One coat excluding priming coat	sqm	Oil bound distemper	0.10 kg	
			Primer	0.018 liter	
	(b) two coats including priming coat	sqm	Oil bound distemper	0.15 kg	
			Oil bound distemper		
	(b) two coats excluding priming coat	sqm	Oil bound distemper		
56	Snowcem or Durocem- (a) One coat	sqm	Snowcem	0.18 kg	
			Durocem		
	(b) two coats	sqm	Snowcem	0.30 kg	
57	Painting coat with ready mixed- (a) Wood primer, pink (for hard & softwood).	sqm	Durocem		
			Primer	0.075 liter	

S. No.	Item	Unit	Material	Quantities of materials	Remark
	(b)Aluminum priming water resistant (for resinous wood and plywood).	sqm	Primer	0.075 liter	
	(c) Zinc chorme priming or red lead priming (for steel surface).	sqm	Primer	0.054 liter	
58	Painting two or more coats (excluding priming coat) on new surfaces with-				
	(a) Ready mixed paint (for wooden surfaces).	sqm	Paint	0.125 liter	
	(b)Ready mixed paint (for G.S. Sheets)	sqm	Paint	0.08 liter	
	(c) Aluminum paint	sqm	Paint	0.08 liter	
	(d) Enamel paint	sqm	Paint	0.10 liter	
59	Painting one or more coats on prviously painted surface with				
	(a)Ready mixed paint (for wooden surfaces).	sqm	Paint	0.075 liter	
	(b)Ready mixed paint (for G.S. Sheets)	sqm	Paint	0.046 liter	
	(c) Aluminum paint	sqm	Paint	0.046 liter	
	(d) Enamel paint	sqm	Paint	0.061 liter	
60	Painting with ready mixed anti-corrosive bituminous black paint-				
	(a) Two or more coats on new Surfaces	sqm	Paint	0.095 liter	
	(b) One or more coats on previously painted surfaces	sqm	Paint	0.057 liter	
61	Painting with synthetic enamel paint-				
	(a) Two or more coats on new Surfaces	sqm	Paint	0.116 liter	
	(b) One or more coats on previously painted surfaces	sqm	Paint	0.07 liter	
62	Wall painting with plastic emulsion paint (excluding priming coat)-				
	(a) Two or more coats on new Surfaces	sqm	Paint	0.121 liter	
	(b) One or more coats on previously painted surfaces	sqm	Paint	0.073 liter	
63	Painting one or more coats with black Japan Paint.	sqm	Paint	0.07 litre	

S. No.	Item	Unit	Material	Quantities of materials	Remark
64	Varnishing one or more coats with-				
	(a) Clear synthetic varnish	sqm	varnish	0.075 litre	
	(b) Copal varnish	sqm	varnish	0.07 litre	
65	Painting with oil type wood preservatives-				
	(a) Two or more coats on new Surfaces	sqm	Wood preservative	0.10 liter	
	(b) One or more coats on previously painted surfaces	sqm	Wood preservative	0.081 liter	
66	Oiling with linseed oil-				
	(a) Two or more coats on new Surfaces	sqm	linseed oil	0.116 liter	
	(b) One or more coats on previously painted surfaces	sqm	linseed oil	0.07 liter	
67	Seepage drains 60x60 cm-				
	(a) Filled with graded boulders or quarried stone.	m	Boulder	0.36 cum	
	(b) Filled in layers with boulders (or quarried stone) shingle and sand.	m	Boulder	0.09 cum	
			Shingle	0.112 cum	
			Sand	0.158 cum	
68	Seepage drains 60x60 cm-				
	(a) Filled with graded boulders or quarried stone.	m	Boulder	0.563 cum	
	(b) Filled in layers with boulders (or quarried stone) shingle and sand.	m	Boulder	0.14 cum	
			Shingle	0.174 cum	
			Sand	0.246 cum	
69	Filter blanket	cum	Graded metal or shingle or sand	1.00 cum	
70	Rock toe in earthen embankment	cum	Quarried stone or bould	1.00 cum	
71	45 cm thick stone pitching	sqm	Stone chips	0.45 cum 0.03 cum	
72	30 cm thick stone pitching	sqm	Stone chips	0.30 cum 0.021 cum	
73	90 cm thick stone pitching	sqm	Stone chips	0.90 cum 0.06 cum	
74	Fixing in position 1 mm thick and 355 mm wide annealed copper Sheet strips for contraction joints.	m	Copper Sheet	3.5 kg.	

S. No.	Item	Unit	Material	Quantities of materials	Remark
75	40 mm thick plaster for contraction joints.	sqm	Mortar	0.05 cum	
76	Providing dumped rip rap	cum	Rubble metal	0.65 cum 0.35 cum	
77	Fixing in position NP2 or NP3 Hume pipe in CM 1:3-				
	(a) 80 mm dia	each joint	mortar	0.001 cum	
	(b) 100 mm dia	each joint	mortar	0.0013 cum	
	(c) 150 mm dia	each joint	mortar	0.0016 cum	
	(d) 250 mm dia	each joint	mortar	0.0023 cum	
	(e) 300 mm dia	each joint	mortar	0.0033 cum	
	(f) 350 mm dia	each joint	mortar	0.0037 cum	
	(g) 400 mm dia	each joint	mortar	0.004 cum	
	(h) 450 mm dia	each joint	mortar	0.007 cum	
	(i) 500 mm dia	each joint	mortar	0.008 cum	
	(j) 600 mm dia	each joint	mortar	0.009 cum	
	(k) 700 mm dia	each joint	mortar	0.011 cum	
	(l) 750 mm dia	each joint	mortar	0.011 cum	
	(m) 800 mm dia	each joint	mortar	0.012 cum	
	(n) 900 mm dia	each joint	mortar	0.013 cum	
	(o) 1000 mm dia	each joint	mortar	0.015 cum	
	(p) 1100 mm dia	each joint	mortar	0.016 cum	
	(q) 1200 mm dia	each joint	mortar	0.018 cum	
78	Portland cement	cum	Portland cement	28.80 bags	

AREAS AND WEIGHTS OF STEEL SECTIONS
(i) Round bars (I.S. : 1732-1971)

Dia	Weight per meter	Sectional area	Perimeter	Dia	Weight per meter	Sectional area	Perimeter
mm	kg	sqm	cm	mm	kg	sqm	cm
5	0.154	0.196	1.571	20	2.47	3.14	6.286
6	0.222	0.283	1.886	22	2.98	3.8	6.914
8	0.395	0.503	2.514	25	3.85	4.91	7.857
10	0.617	0.785	3.143	28	4.83	6.16	8.8
12	0.888	1.13	3.771	32	6.31	8.04	10.057
14	1.21	1.54	4.4	36	7.99	10.2	11.314
16	1.58	2.01	5.029	40	9.85	12.6	12.571
18	2	2.54	5.657				

(ii) Square bars (I.S. : 1732-1971)

Side width	Weight per meter	Sectional area	Side width	Weight per meter	Sectional area
mm	kg	sqm	mm	kg	sqm
5	0.196	0.25	20	3.14	4
6	0.283	0.36	25	4.91	6.25
8	0.502	0.64	32	8.04	10.2
10	0.785	1	40	12.6	16
12	1.13	1.44	45	15.9	20.2
16	2.01	2.56	50	19.6	25

(iii) Flats (IS : 1731-1971)

Width mm	Thickness mm							
	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
	Weight per meter length kg							
10	0.236	0.314	0.393	0.471	-	-	-	-
14	0.33	0.44	0.55	0.659	0.879	-	-	-
20	0.471	0.628	0.785	0.942	1.26	1.57	1.88	2.51
25	0.689	0.785	0.981	1.18	1.57	1.96	2.36	3.14
30	0.707	0.942	1.18	1.41	1.88	2.36	2.83	3.77
35	0.824	1.1	1.37	1.65	2.2	2.76	3.3	4.4
40	0.942	1.26	1.57	1.88	2.51	3.14	3.77	5.02
45	-	1.41	1.77	2.12	2.83	3.53	4.24	5.65
50	1.18	1.57	1.96	2.36	3.14	3.93	4.71	6.28
55	-	1.73	2.16	2.59	3.45	4.32	5.18	6.91
60	1.41	1.88	2.36	2.83	3.77	4.71	5.65	7.54
65	-	2.04	2.55	3.06	4.08	5.1	6.12	8.16
70	-	2.2	2.75	3.3	4.4	5.5	6.59	8.79
75	-	2.36	2.94	3.53	4.77	5.89	7.07	9.42
80	-	2.51	3.14	3.77	5.02	6.28	7.54	10
90	-	-	3.53	4.24	5.65	7.07	8.48	11.3
100	-	-	3.93	4.71	6.28	7.85	9.42	12.6
110	-	-	4.32	5.18	6.91	8.64	10.4	13.8
120	-	-	4.71	5.65	7.54	9.42	11.3	15.1
130	-	-	-	6.12	8.16	10.2	12.2	16.3
140	-	-	-	-	8.79	11	13.2	17.6
150	-	-	-	-	9.42	11.8	14.1	18.8
160	-	-	-	-	10	12.6	15.1	20.1
180	-	-	-	-	11.3	14.1	17	22.6
200	-	-	-	-	-	15.7	18.8	25.1
250	-	-	-	-	-	19.6	23.6	31.4
300	-	-	-	-	-	-	28.3	37.2

Equal Leg Angles

Designation	Size mm x mm	Thickness mm	Sectional area sq cm	Weight per meter Kg
1	2	3	4	5
ISA 20 20	20x20	3	1.12	0.19
		4	1.45	1.10
ISA 25 25	25x25	3	1.41	1.10
		4	1.84	1.40
		5	2.25	1.80
ISA 30 30	30x30	3	1.73	1.40
		4	2.26	1.80
		5	2.77	2.20
IAS 35 35	35x35	3	2.03	1.60
		4	2.66	2.10
		5	3.27	2.60
		6	3.86	3.00
ISA 40 40	40x40	3	2.34	1.80
		4	3.07	2.40
		5	3.78	3.00
		6	4.47	3.50
ISA 45 45	45x45	3	2.64	2.10
		4	3.47	2.70
		5	4.28	3.40
		6	5.07	4.00
ISA 50 50	50x50	3	2.95	2.30
		4	3.88	3.00
		5	4.79	3.80
		6	5.68	4.50
		7	6.56	5.15
		8	7.41	5.82
ISA 55 55	55x55	5	5.27	4.10
		6	6.26	4.90
		8	8.18	6.40
		10	10.02	7.90

Designation	Size mm x mm	Thickness mm	Sectional area sq cm	Weight per meter Kg
ISA 60 60	60x60	4	4.71	3.70
		5	5.75	4.50
		6	6.84	5.40
		8	8.96	7.00
		10	11.00	8.60
ISA 65 65	65x65	5	6.25	4.90
		6	7.44	5.80
		8	9.76	7.70
		10	12.00	9.40
ISA 70 70	70x70	5	6.77	5.30
		6	8.06	6.30
		7	9.40	7.30
		8	10.68	8.30
		10	13.02	10.20
ISA 75 75	75x75	5	7.27	5.70
		6	8.66	6.80
		8	11.38	8.90
		10	14.02	11.00
ISA 80 80	80x80	6	9.29	7.30
		10	15.05	11.80
		12	17.81	14.00
ISA 90 90	90x90	6	10.47	8.20
		8	13.79	10.80
		10	17.03	13.40
		12	20.19	15.80
ISA 100 100	100X100	6	11.67	9.20
		6.5	12.70	9.99
		8	15.39	12.10
		12	22.59	17.70
		15	27.90	21.90
ISA 110 110	110X110	8	17.08	13.40
		10	21.12	16.60
		12	25.08	19.70

Designation	Size mm x mm	Thickness mm	Sectional area sq cm	Weight per meter Kg
		16	32.76	25.70
ISA 120 120	120X120	8	18.70	14.70
		10	23.20	18.20
		12	27.50	21.60
		15	33.90	26.60
ISA 130 130	130X130	8	20.28	15.90
		10	25.12	19.70
		12	29.88	23.50
		16	39.16	30.70
ISA 150 150	150X150	10	29.21	22.90
		12	34.77	27.30
		15	43.00	33.80
		16	45.65	35.80
		18	51.00	40.10
		20	56.21	44.10
ISA 180 180	180X180	15	52.10	40.90
		18	61.90	48.60
		20	68.30	53.70
ISA 200 200	200X200	12	46.94	36.90
		16	61.82	48.50
		20	76.38	60.00
		24	90.60	71.10
		25	94.13	73.90

(v) Unequal Leg Angles (I.S. :808(Pt-V)-1976)

Designation	Size mm x mm	Thickness mm	Sectional area sq cm	Weight per meter Kg
1	2	3	4	5
ISA 30 20	30x20	3	1.41	1.10
		4	1.84	1.40
		5	2.25	1.80
ISA 40 20	40x20	3	1.73	1.36
		5	2.77	2.17
ISA 40 25	40x25	3	1.88	1.50
		4	2.46	1.90
		5	3.02	2.40
		6	3.56	2.80
ISA 45 30	45x30	3	2.18	1.70
		4	2.86	2.20
		5	3.52	2.80
		6	4.16	3.30
ISA 50 30	50x30	3	2.34	1.80
		4	3.07	2.40
		5	3.78	3.00
		6	4.47	3.50
ISA 60 30	60x30	5	4.29	3.37
		6	5.08	3.99
ISA 60 40	60x40	5	4.76	3.70
		6	5.65	4.40
		7	6.55	5.14
		8	7.37	5.80
ISA 65 45	65x45	5	5.26	4.10
		6	6.25	4.90
		8	8.17	6.40
ISA 65 50	65x50	5	5.54	4.35
		6	6.58	5.16
		7	7.60	5.96
		8	8.60	6.75

Designation	Size mm x mm	Thickness mm	Sectional area sq cm	Weight per meter Kg
ISA 70 45	70x45	5	5.52	4.30
		6	6.56	5.20
		8	8.58	6.70
		10	10.52	8.30
ISA 75 50	75x50	5	6.02	4.70
		6	7.16	5.60
		7	8.31	6.53
		8	9.38	7.40
		10	11.52	9.00
ISA 80 50	80x50	5	6.27	4.90
		6	7.46	5.90
		8	9.78	7.70
		10	12.02	9.40
ISA 80 60	80x60	6	8.11	6.37
		7	9.38	7.36
		8	10.60	8.34
ISA 90 60	90x60	6	8.65	6.80
		10	14.01	11.00
		12	16.57	13.00
ISA 90 65	90x65	6	9.01	7.07
		7	10.40	8.19
		8	11.80	9.29
		10	14.60	11.40
ISA 100 50	100X50	6	8.73	6.85
		7	10.10	7.93
		8	11.40	8.99
ISA 100 75	100X75	6	10.14	8.00
		8	13.36	10.50
		10	16.50	13.00
		12	19.56	15.40
ISA 120 80	120X80	8	15.50	12.20
		10	19.10	15.00
		12	22.70	17.80

Designation	Size mm x mm	Thickness mm	Sectional area sq cm	Weight per meter Kg
ISA 125 75	125x75	6	11.66	9.20
		8	15.38	12.10
		10	19.02	14.90
		12	22.70	17.80
ISA 125 95	125X95	6	12.92	10.10
		8	17.04	13.40
		10	21.08	16.50
		12	25.04	19.70
ISA 135 65	135X65	8	15.10	11.80
		10	18.60	14.60
		12	22.10	17.30
ISA 150 90	150X90	10	23.20	18.20
		12	27.50	21.60
		15	33.90	26.60
ISA 150 115	150X115	8	20.71	16.30
		10	25.66	20.10
		12	30.52	24.00
		16	40.00	31.40
ISA 200 100	200X100	10	29.21	22.90
		12	34.77	27.30
		15	43.00	33.70
		16	45.65	35.80
ISA 200 150	200X150	10	34.29	26.90
		12	40.85	32.10
		15	50.50	39.60
		16	53.73	42.20
		18	60.00	47.10
		20	66.29	52.00

(VI) Channel [I.S. :808 (Pt. III)-1979]

Designation Kg	Weight per meter sqcm	Sectional area mm	Depth of section mm	Width of flange mm	Thickness of flange mm	Thickness of web mm
Mc 75	7.14	9.10	75	40	7.50	4.80
Mc 100	9.56	12.20	100	50	7.70	5.00
Mc 125	13.10	16.70	125	65	8.20	5.30
Mc 125*	13.70	17.50	125	66	8.10	6.00
Mc 150	13.80	17.50	150	75	9.00	5.70
Mc 150*	17.70	22.60	150	76	9.00	6.50
Mc 175	19.60	24.90	175	75	10.20	6.00
Mc 175*	21.70	27.60	175	77	10.20	7.50
Mc 200	22.30	28.50	200	75	11.40	6.20
Mc 200*	24.30	31.00	200	76	11.40	7.50
Mc 225	26.10	16.70	225	80	12.40	6.50
Mc 225*	30.70	17.50	225	83	12.40	9.00
Mc 250	30.60	21.30	250	80	14.10	7.20
Mc 250*	24.20	22.60	250	82	14.10	9.00
Mc 250*	38.10	22.60	250	84	14.10	11.00
Mc 300	36.30	24.90	300	90	13.60	7.80
Mc 300*	41.50	27.60	300	92	13.60	10.00
Mc 300*	46.20	28.50	300	94	13.60	12.00
Mc 350	42.70	31.00	350	100	13.50	8.30
Mc 400	50.10	22.60	400	100	15.30	8.80
McP 75	7.14	9.10	75	40	7.50	4.80
McP 100	9.56	12.20	100	50	7.70	5.00
McP 125	13.10	16.70	125	65	8.10	5.30
McP 125*	13.70	17.50	125	66	8.10	6.00
McP 150	16.80	21.30	150	75	9.00	5.70
McP 150*	17.70	22.60	150	76	9.00	6.50
McP 175	19.60	24.90	175	75	10.20	6.00
McP 175*	21.70	27.60	175	77	10.20	7.50
McP 200	22.30	28.50	200	75	11.40	6.20
McP 200*	24.30	31.00	200	76	11.40	7.50
McP 225	26.10	33.30	225	80	12.40	6.50

Designation Kg	Weight per meter sqcm	Sectional area mm	Depth of section mm	Width of flange mm	Thickness of flange mm	Thickness of web mm
McP 225*	30.70	39.00	225	83	12.40	9.00
McP 250	30.60	39.00	250	80	14.10	7.20
McP 250*	34.20	43.50	250	82	14.10	9.00
McP 250*	38.10	48.50	250	84	14.10	11.00
McP 300	36.30	46.30	300	90"	13.60	7.80
McP 300*	41.50	52.80	300	92	13.60	10.00
McP 300*	46.20	58.80	300	94	13.60	12.00
McP 350	42.70	54.40	350	100	13.50	8.30
McP 400	50.10	63.80	400	100	15.30	8.80

***Thick section**

Hot Rolled Steel Beams [I.S.:808 (Pt. I)-1973]

Designation Kg	Weight per meter sqcm	Sectional area mm	Depth of section mm	Width of flange mm	Thickness of flange mm	Thickness of web
MB 100	11.50	14.70	100	70	7.50	4.50
MB 125	13.40	17.00	125	70	8.00	5.00
MB 150	15.00	19.10	150	75	8.00	5.00
MB 175	19.50	24.90	175	85	9.00	5.80
MB 200	25.40	32.30	200	100	10.80	5.70
MB 225	31.20	39.70	225	110	11.80	6.50
MB 250	37.30	47.60	250	125	12.50	6.90
MB 300	46.10	58.70	300	140	13.10	7.70
MB 350	52.40	66.70	350	140	14.20	8.10
MB 400	61.60	78.50	400	140	16.00	8.90
MB 450	72.40	92.30	450	150	17.40	9.40
MB 500	86.90	111.00	500	180	17.20	10.20
MB 550	104.00	132.00	550	190	19.30	11.20
MB 600	123.00	156.00	600	210	20.80	12.00

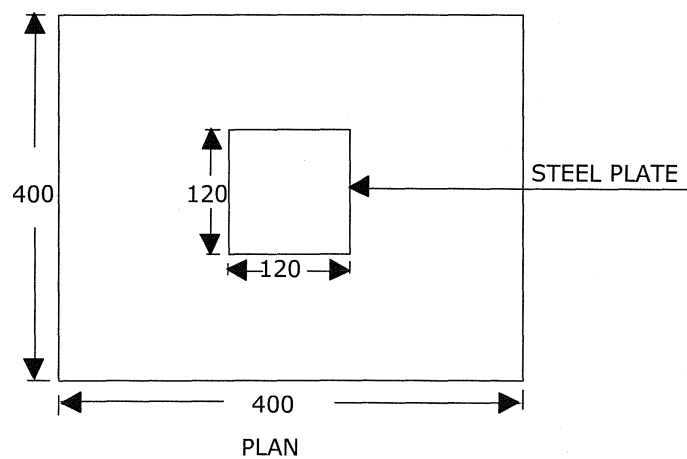
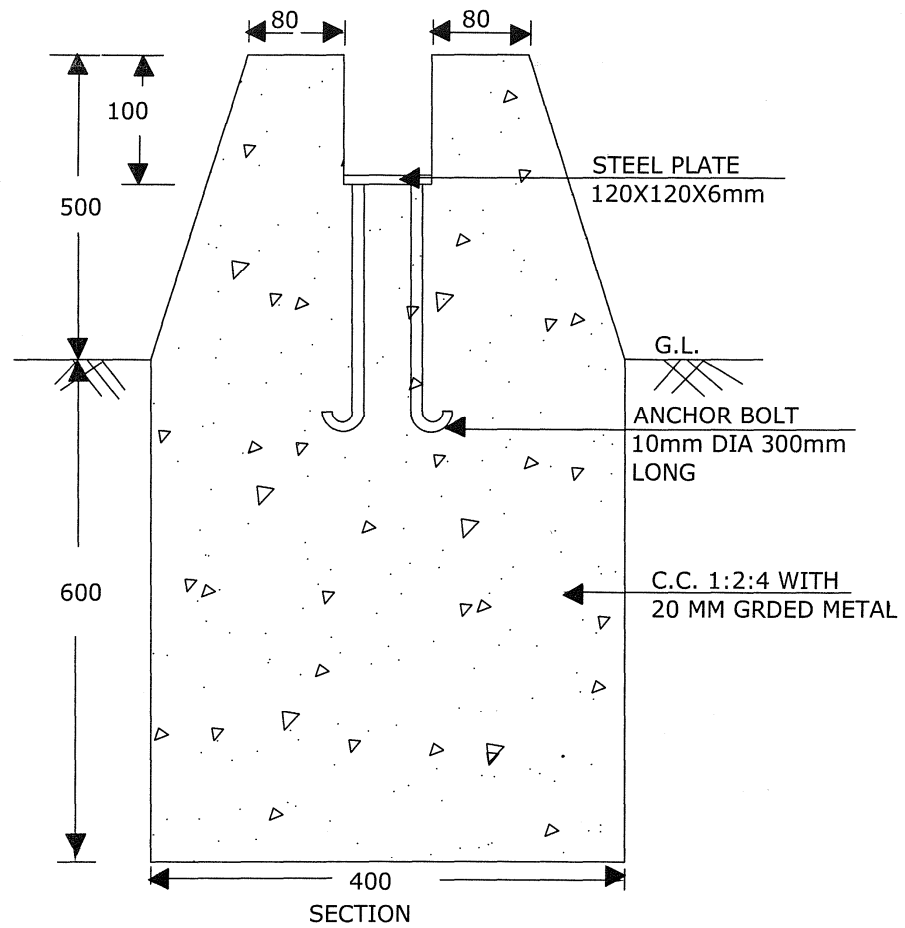
Hot Rolled Steel Columns [I.S.:808 (Pt. II)-1973]

Designation Kg	Weight per meter sqcm	Sectional area mm	Depth of section mm	Width of flange mm	Thickness of flange mm	Thickness of web
SC 100	20.00	2.55	100	100	10.00	6.00
SC 120	26.20	3.34	120	120	11.00	6.50
SC 140	33.30	4.24	140	140	12.00	7.00
SC 160	41.90	5.34	160	160	13.00	8.00
SC 180	50.50	6.44	180	180	14.00	8.50
SC 200	60.30	7.68	200	200	15.00	9.00
SC 220	70.40	8.98	220	220	16.00	9.50
SC 250	85.60	10.90	250	250	17.00	10.00

CONVERSION TABLE

To convert	into	Multiply by	
Length			
Inch	centimeter (cm)	2.54	0.393701
Feet	meter (m)	0.3048	3.28084
yard	meter	0.9144	1.09361
furlong	kilometer(Km)	0.201168	4.97097
mile	kilometer	1.609344	0.621371
international nautical mile	kilometer	1.852	0.53996
Area			
Sq inch	Sq centimeter (sqcm)	0.4156	0.155
Sq feet	Sq meter (sqm)	0.092903	10.7639
Sq yard	Sq meter (sqm)	0.836127	1.19599
Sq mile	Sq kilometer (sqkm)	1.58999	0.386103
Acre	Hectare(Ha)	0.404686	2.47105
Volume and Capacity			
Cubic Inch	Cubic centimeter (cucm)	16.3871	0.0610237
Cubic Feet	Cubic meter (cum)	0.0283168	35.3147
Cubic yard	Cubic meter (cum)	0.764555	1.30795
Imperial gallon	Liter	4.54069	0.219969
Mass			
Ounce	Gram	28.3495	0.035274
Pound	Kilogram	0.453592	2.20462
Ton	Tonne	1.10605	0.984207
Mound	Kilogram	37.3242	0.0267923
Seer	Kilogram	0.931	1.07169
Tola	Gram	11.6638	0.085735
Pressure or stress			
Pounds per sq. foot	kg per sqm	4.88234	0.204816
Pounds per sq. inch	kg per sq cm	0.070307	14.2233
Tons per sq. foot	tonne per sq m	10.9366	0.0914358
Newton per sq. meter	kg per sq m	9.80665×10^4	1.01972×10^5
Density			
Pounds per cubic inch	grams per cum	27.679821	0.0361274
Pounds per cubic feet	Kg per cum	16.0185	0.062428
Moment of force			
Newton meters	kg force meters	0.101972	9.80665
To obtain	from		Multiply by

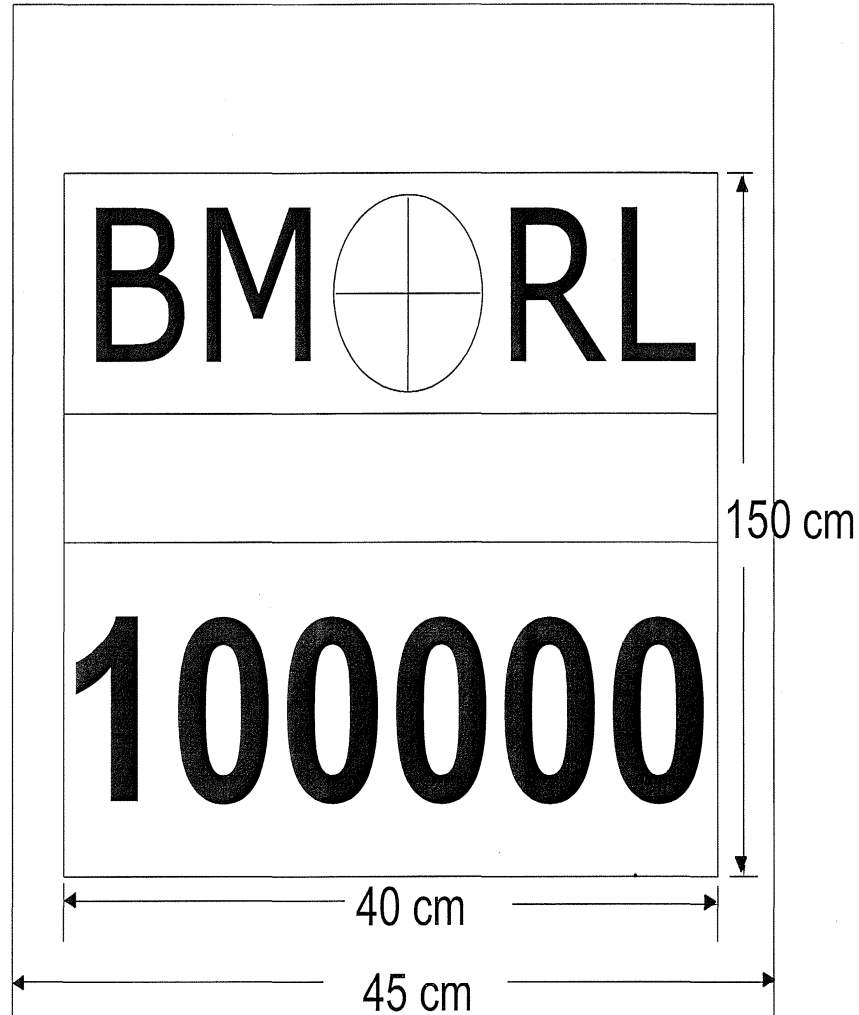
STANDARD BENCH MARK TYPE DESIGN - 8



NOT TO SCALE

All dimensions in mm

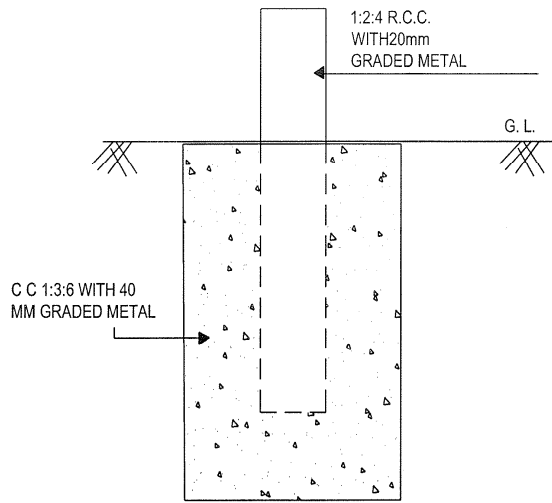
**BENCH MARK ON MASONRY WORK
TYPE DESIGN - 8**



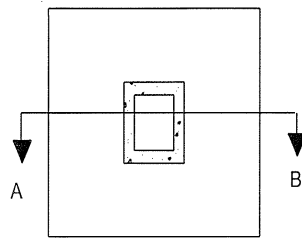
● NOT TO SCALE

BENCH MARKS ESTABLISHED ON MASONRY WORKS ARE INEXPENSIVE AND SERVE AS PERMANANT BM. THESE MAY BE ESTABLISHED EITHER NEAR THE EDGE OR IN THE CENTER OR THE PARAPET CONSTRUCTED ON THE OUTER EDGE OF THE SERVICE ROAD. BM'S SHOULD BE ESTABLISHED ON ALL IMPORTEENT MASONRY WORK ON CANAL. THERE SHOULD BE ATLEASD ONE BM AT EVERY KM. DISTANCE

TYPE DESIGN 6 – ORDINARY BENCH MARK



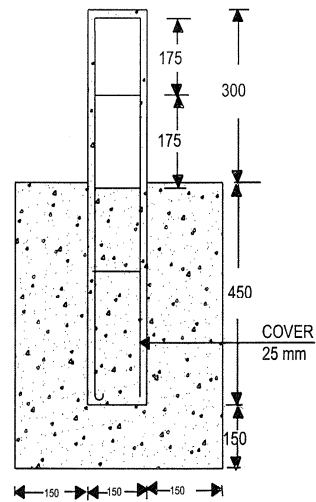
ELEVATION



PLAN

SCHEDULE OF REINFORCEMENT					
BAR NO.	DIA IN mm	NO. OF BARS	SHAP OF BARS	LENGTH IN mm	
				EACH BAR	TOTAL
1	6	2		1632	3264
2	6	3		496	1488
				TOTAL	4752

TOTAL Wt. = 1.05 Kg.
ALL DIMENSIONS IN mm

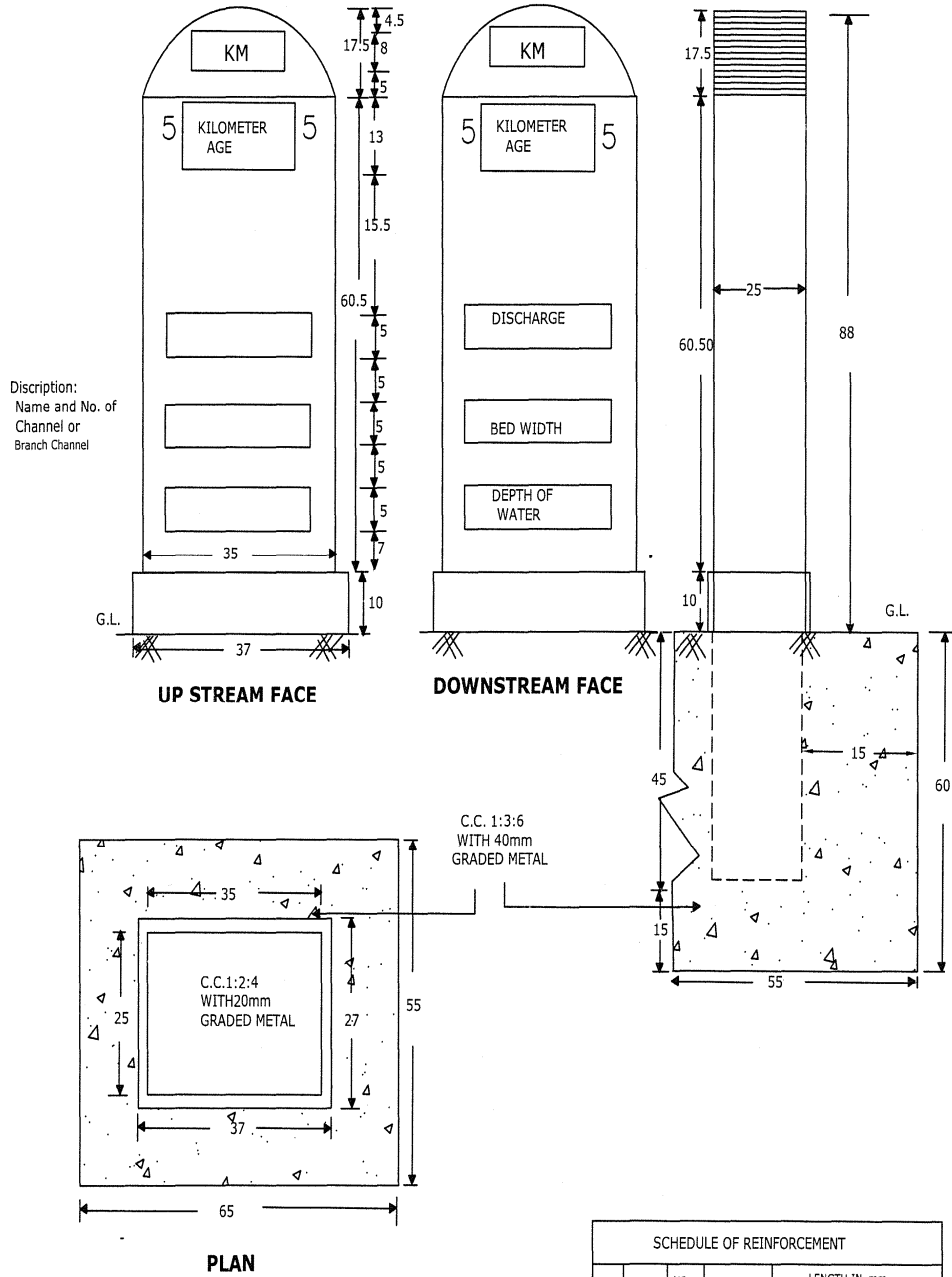


SECTION A-B

● NOT TO SCALE

KILOMETER STONE TYPE – 1

TYPE DESIGN -1



● NOT TO SCALE

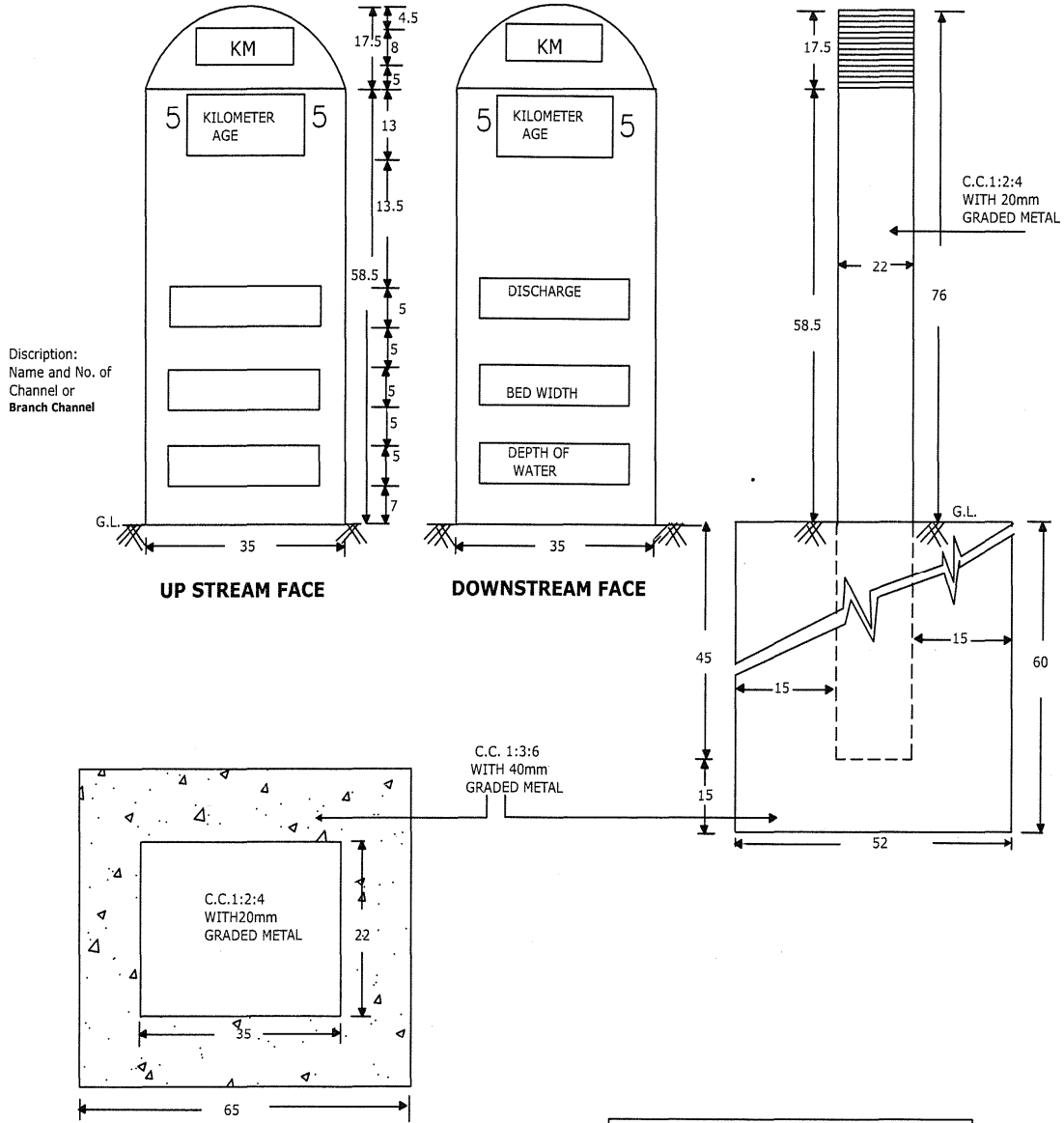
NOTE

1. All Dimensions in cm.
2. For all Chennals carrying Discharge more than 3 cumec.

SCHEDULE OF REINFORCEMENT					
BAR NO.	DIA IN mm	NO. OF BARS	SHAP OF BARS	LENGTH IN mm	
				EACH BAR	TOTAL
1	10	2		2911	5822
2	6	6		1144	6864
				TOTAL Wt.	5.2 Kg.

KILOMETER STONE TYPE – 2

TYPE DESIGN -2



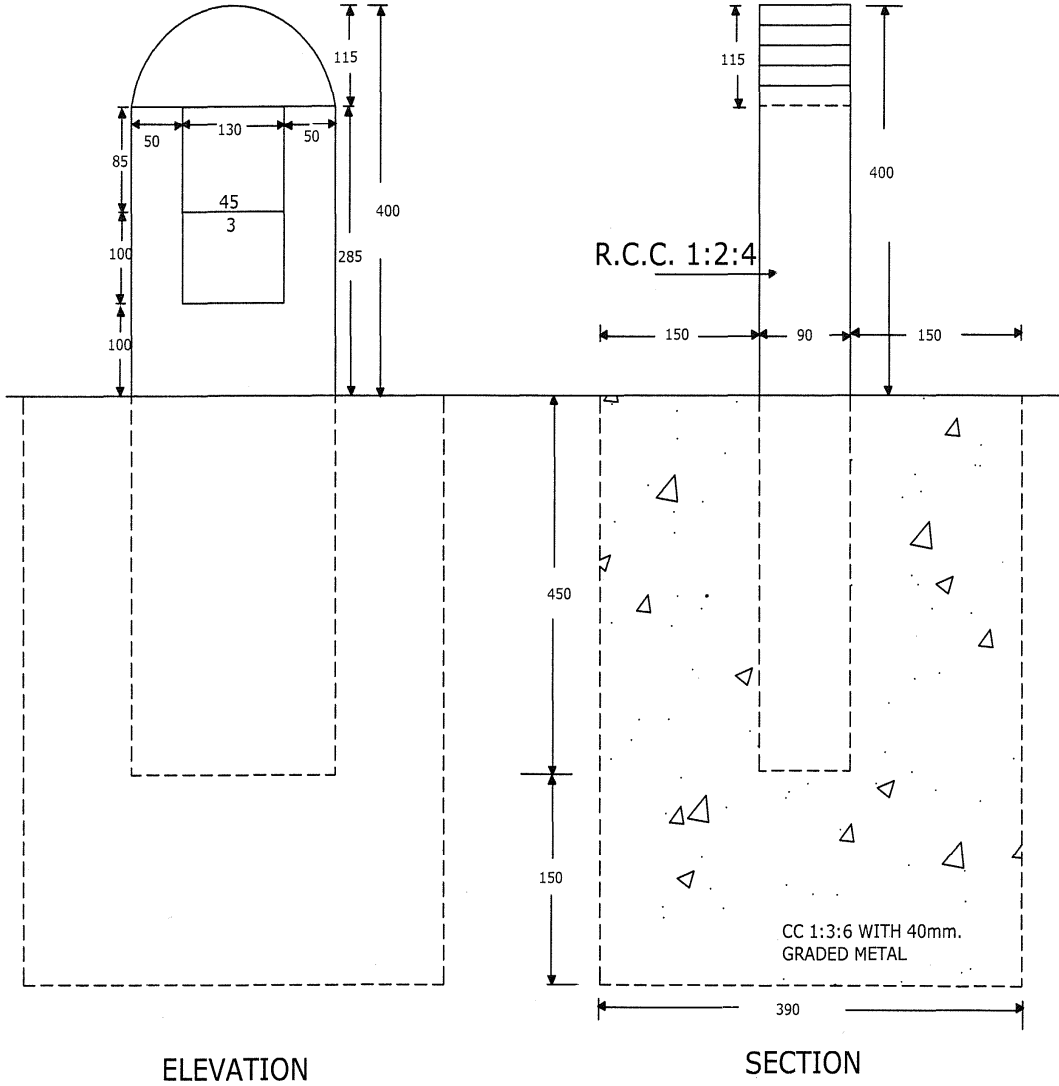
• NOT TO SCALE

SCHEDULE OF REINFORCEMENT					
BAR NO.	DIA IN mm	NO. OF BARS	SHAP OF BARS	LENGTH IN mm	
				EACH BAR	TOTAL
1	10	2		2671	5342
2	6	6		1144	6864
				TOTAL Wt	4.80 Kg.

NOTE

1. All Dimensions in cm.
2. For all Chennals carrying Discharge more than 3 cumec.

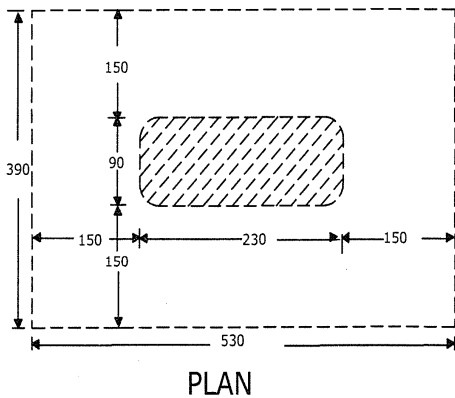
**0.2 KILOMETRE STONE
TYPE DESIGN - 3**



ELEVATION

SECTION

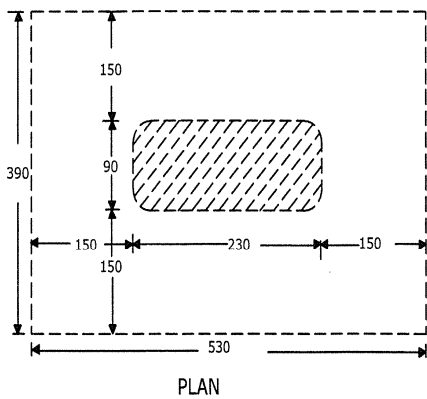
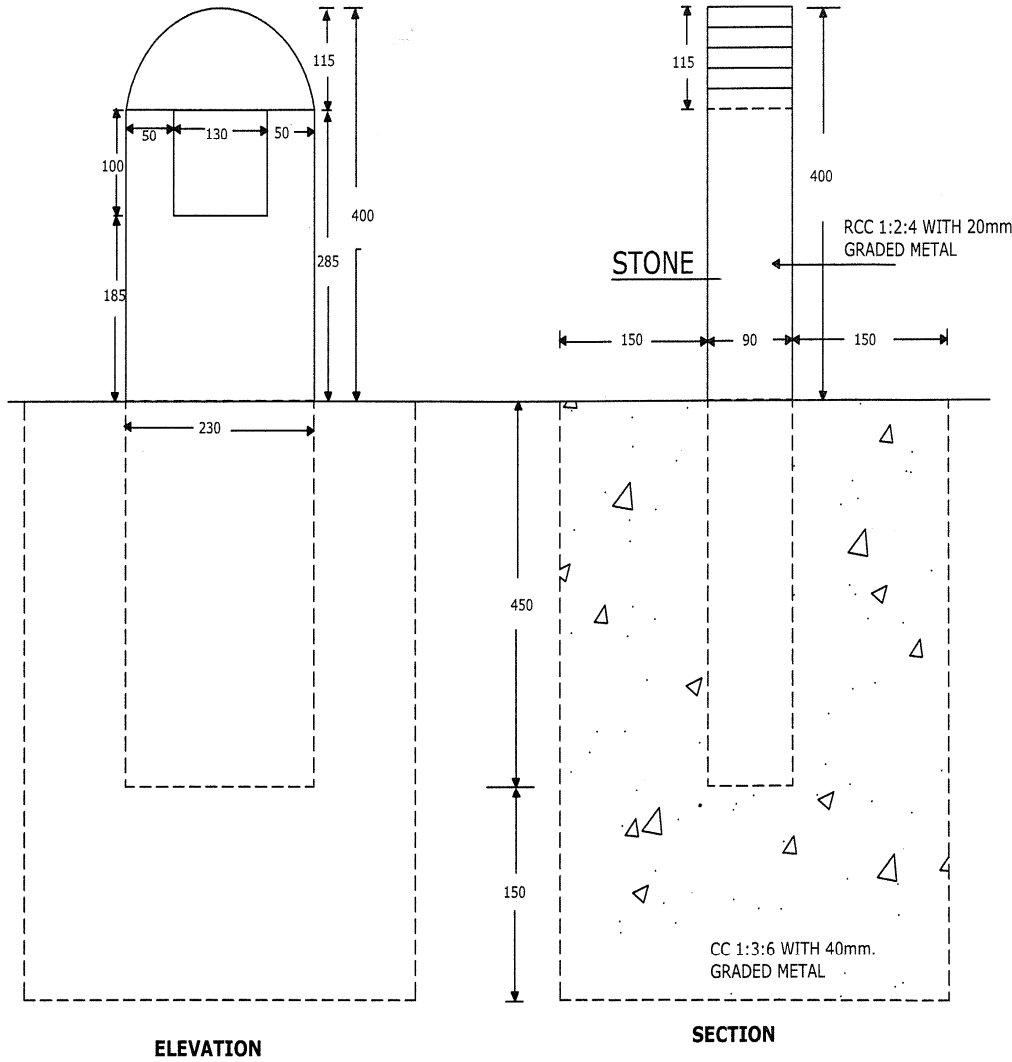
● NOT TO SCALE



PLAN

NOTE :-
SHALL BE NORMALLY FIXED AT
EVERY 200 METER ON CHENNAIS
CARRYING DISCHARGE OVER 0.3 cumec.

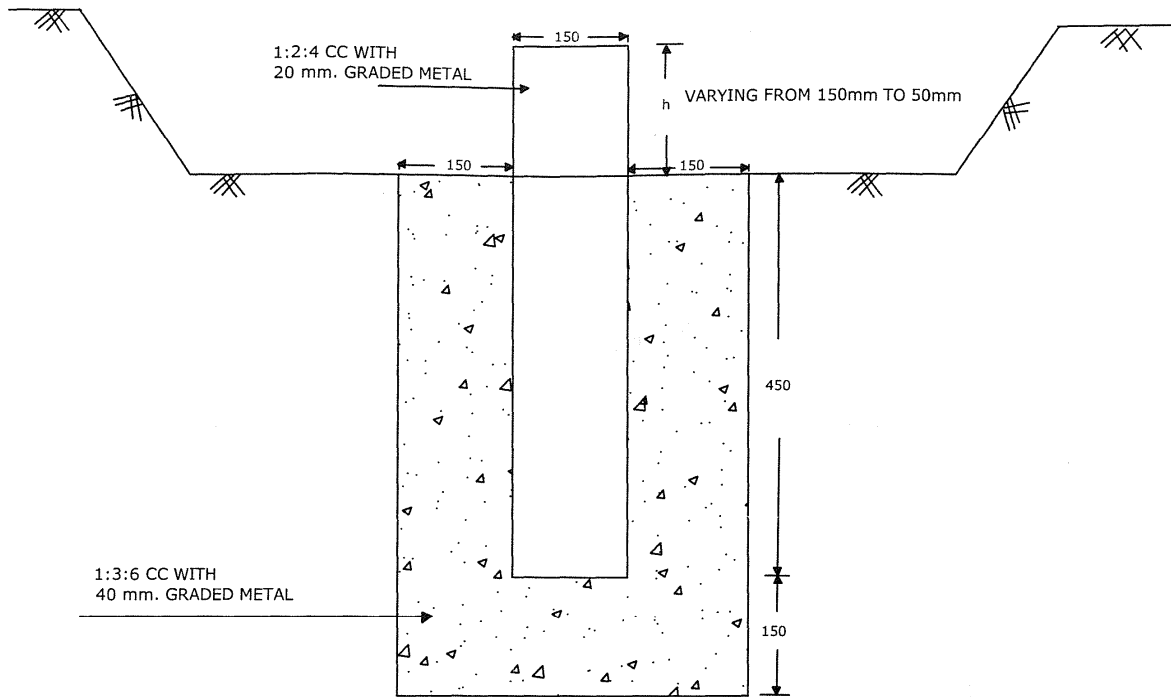
CHAINAGE CUM BOUNDARY STONE TYPE DESIGN - 4



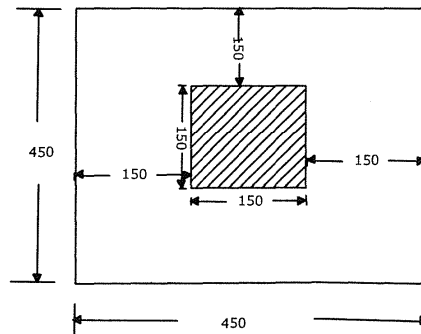
NOT TO SCALE

NOTE :-
SHALL BE USED AS CHAINAGE CUM BOUNDARY
STONE FOR ALL IRRIGATION CHANNELS AND AS
BOUNDARY STONES FOR DEMARCATING BOUNDARIES
OF HEAD WORK BUILDING, QUARRIES Etc.

BED GRADE STONE TYPE DESIGN - 5



ELEVATION



PLAN

NOTE:-

THE HEIGHT OF BED GRADE STONE ABOVE DESIGNED
BE LEVEL SHELL BE 15 cm FOR DISCHARGE ABOVE 3 cumec
10 cm FOR DISCHARGE FROM 0.50 TO 3 cumec
AND 5cm. BELOW 0.50 cumec.

LIST OF MANDATORY TESTS

Material/Test	Field/Laboratory Test	Test procedure	Minimum quantity of material of work for carrying out the test	Frequency of testing
Cement				
Adulteration test	Laboratory	IS:3535 – 1966	50 tonnes	Every 50 tonnes or part thereof.
Fine aggregates (sand)				
Particle size distribution	field	IS:2386 –(Pt-I) 1963	20 cum	Every 40 cum or part thereof.
Bulking of fine aggregate	field	IS:2386-(Pt-III) 1963	20 cum	One per shift per stock pile.
Silt content	field	IS:2386 -(Pt-II) 1963	20 cum	Every 40 cum or part thereof.
Coarse aggregates (Metal, shingle or gravel)				
Flakiness index	field	IS:2386 -(Pt-I) 1963	45 cum	Every 90 cum or part thereof.
Particle size distribution	field	IS:2386 -(Pt-I) 1963	45 cum	Every 45 cum or part thereof.
% of soft or deleterious materials	field	IS:2386 -(Pt-II) 1963	45 cum	Every 90 cum or part thereof.
Cement concrete and RCC not leaner than 1:3:6 (M 10)				
Slump test	field	IS: 1999 – 1959 IS: 7320 – 1974		One per every two hours working per mixer
Compressive strength of molded cement concrete specimen.	Laboratory	IS: 516 – 1959	15 cum	Quantity of No. of days sample concreting cum
		IS: 1199 – 1959		06....15 2
				16....30 3
		IS: 456 – 1978		31....50 4
				51 and above . 4 plus one additional sample for each additional 50 cum or part thereof.

Material/Test	Field/Laboratory Test	Test procedure	Minimum quantity of material of work for carrying out the test	Frequency of testing
Burnt clay building bricks.				
Water absorption and water efflorescence	Laboratory	IS:3495 (Pt.I to IV) 1976	1,00,000	One test per source of manufacture.
Compressive strength	Laboratory	IS:3495 (Pt.I to IV) 1976	1,00,000	Two tests for first lot on one lakh bricks and one test for every subsequent one lakh bricks or – part thereof.
Flush Door				
End immersion test knife test Adhesion.	Laboratory	IS: 2202 (Pt. I) 1980	26 shutters	As per sampling and testing specified in Table 3 of IS: 2202 (Pt.I) – 1980.
Reinforcement steel				
Tensile test	Laboratory	IS:1608 –1972 IS: 226 –1975	(i) 3 tonnes of bars of dia. Below 10 mm.	(i) Under 10 mm dia Every 25 tonnes or part thereof.
Bend test	Laboratory	IS : 1599 -1974	(ii) 3 tonnes of 10 to 16 mm dia bars.	(ii) 10 mm to 16 mm Every 35 tonnes or part thereof.
Rebend test	Laboratory	IS : 1786 –1979	(ii) 3 tonnes of bars of dia above 16 mm .	(iii) Over 16 mm dia Every 45 tonnes or part thereof.
Retest	Laboratory	IS : 1786 –1979		
Precast concrete slabs.				
Flexural strength.	Laboratory	IS : 4969 –1968	500 slabs.	

CHAPTER 43 – SPECIAL ITEMS OF BUILDING WORKS

Notes:-

1. The rates include-
 - (a) All lead and lifts for all materials.
 - (b) Cost of labour for installation, material, tools and plants necessary to complete the job.
 - (c) Cost of making holes in walls, excavation, cutting of floors and making goods the same to its original condition.
2. The rates also include, wherever necessary, conveyance and delivery, handling, loading and unloading, storing, fabrication, hoisting, all necessary labour for finishing to required shape and size, fitting and fixing in position, cutting and waste and other works etc.
3. The materials shall conform to relevant IS.

Item No.	Item	Unit	Rate	Remarks
4301	Supplying chlorpyrifos / Lindane emulsifiable concentrate of 20% in sealed containers including delivery as specified	litre	339.00	
4302	Diluting chemical emulsion (Chlorpyrifos/ lindane) in water as per manufacturers recommendation and injecting for post - constructional anti-termite treatment: Along external wall where the apron is not provided using diluted chemical emulsion @ 7.5 litres / sqm of the vertical surface of the substructure to a depth of 300 mm including excavation channel along the wall & rodding etc. complete:	RM	6.00	
4303	Diluting chemical emulsion (Chlorpyrifos/ lindane) in water as per manufacturers recommendation and injecting for post - constructional anti-termite treatment: Along external wall below concrete or masonry apron along the plinth wall using diluted chemical emulsion@ 0.65 litres per hole including drilling 12mmdia holes 300mm apart and plugging the same with cement mortar 1 :2 (1cement : 2 Coarse sand) to match the existing apron after injecting chemical emulsion.	RM	12.00	
4304	Diluting chemical emulsion (Chlorpyrifos/ lindane) in water as per manufacturers recommendation and injecting for post - constructional anti-termite treatment: Treatment of masonry wall/ soil under existing floors using diluted chemical emulsion @ one litre per hole, including drilling 12 mm diameter holes at the	RM	8.00	

Item No.	Item	Unit	Rate	Remarks
	junction of floor and walls along the cracks on the floor at the interval of 300 mm and plugging with cement mortar 1 :2 (1 cement : 2Coarse sand) to match the existing floor :			
4305	Diluting chemical emulsion (Chlorpyriphos/ lindane) in oil or kerosene based solution as per manufacturers recommendation and injecting the diluted chemical emulsion for post - constructional ani-termite treatment of wood work at points of contact @ 0.5 litres per hole by drilling 6 mm dia holes at downward angle of 45 degree at 150 mm centre to centre and sealing the same.	RM	77.00	
4306	15 mm thick Marble work (machine cut, table rubbed & polished) for wall lining (veneer work) in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) C12mixed with matching pigment. (Area of slab should be over 0.5 sq.m)			
(a)	Makrana white second quality.	Sqm	1629.00	
(b)	Raj Nagar plain.	Sqm	842.00	
(c)	Agaria White	sqm	1147.00	
(d)	Black Zebra.	Sqm	842.00	
(e)	Udaipur green marble	Sqm	857.00	
(f)	Pink plain marble	sqm	1015.00	
(g)	Granite stone	Sqm	3881.00	
4307	15 mm thick Marble work (machine cut, table rubbed & polished) for kitchen platform, vanity counters, window sills and similar locations of required size laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) including joints treated with white cement mixed with matching pigment including rubbing and polishing to edge moulding to give high gloss finish.			
(a)	Makrana white second quality	sqm	1346.00	
(b)	Raj Nagar plain.	Sqm	874.00	
(c)	Agaria White	Sqm	1164.00	
(d)	Black Zebra.	sqm	874.00	
(e)	Udaipur green marble	Sqm	888.00	

Item No.	Item	Unit	Rate	Remarks
(f)	Pink plain marble.	Sqm	1039.00	
4308	Extra for providing edge moulding to 15mm thick stone counters, vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.			
(a)	Marble work	RM	64.00	
(b)	Granite work	RM	106.00	
4309	Extra for fixing marble /granite stone in facia and drops of width upto 150 mm with epoxy resin based adhesive instead of cement mortar including cleaning etc. complete.	RM	240.00	
4310	Extra for making opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including making necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete]	RM	170.00	
4311	Mirror polishing on marble work/Granite work where ever required to give high gloss finish complete.			
(a)	On walls	sqm	139.00	
(b)	On kitchen platform, sills and similar	sqm	77.00	
4312	Making 50mm thick plinth protection of plain cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded crushed stone aggregate 20mm nominal size) over 75mm bed of dry brick ballast 40mm nominal size well rammed and consolidated and grouted with sand including finishing the top smooth.	sqm	150.00	
4313	Providing and fixing 600x450 mm beveled edge 4mm mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	each	494.00	
4314	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing :			
(a)	5mm thick mirror	sqm	2854.00	

Item No.	Item	Unit	Rate	Remarks
4315	Providing and fixing 600x120x5mm glass shelf with edges rounded off supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	each	212.00	
4316	Providing and fixing 15 mm nominal bore C.P. brass fittings of approved make and conforming to IS:8931 including C.P. brass extension if required:			
(a)	Toilet paper holder	each	231.00	
(b)	Soap dish plate	each	151.00	
(c)	Shower rose (revolving type) (150mm)	each	243.00	
(d)	Towel rail (600mm long x 20mm dia)	each	318.00	
4317	Providing, driving and installing driven cast-in-situ reinforced cement concrete piles of specified diameter and length below the pile cap M 35 in cement concrete, to carry safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of shoe and the length of pile to be embedded in the pile cap etc. all complete. (Length of pile for payment shall be measured from top of shoe to the bottom of pile cap) :			
(a)	400 mm dia piles	RM	1442.00	
(b)	450 mm dia piles	RM	1796.00	
(c)	500 mm dia piles	RM	2166.00	
(d)	550 mm dia piles	RM	2350.00	
4318	Boring, providing and installing bored cast-in-situ reinforced cement concrete pile of specified diameter and length below the pile cap M 35 in cement concrete, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with, bentonite solution and temporary casing of appropriate length for setting out and removal of same and the length of the pile to be embedded in the pile cap etc. all complete, including removal of excavated earth with all lifts and leads (Length of pile for payment shall be measured upto bottom of pile cap).			

Item No.	Item	Unit	Rate	Remarks
(a)	300 mm dia piles	RM	1089.00	
(b)	400 mm dia piles	RM	1347.00	
(c)	450 mm dia piles	RM	1752.00	
(d)	600 mm dia piles	RM	2728.00	
4319	Boring, Providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in cement concrete 1:1½:3 (1 cement : 1½ coarse sand : 3 graded stone aggregate 20mm nominal size), to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with bentonite solution and the length of the pile to be embedded in pile cap etc. all complete. (Length of pile for payment shall be measured upto to the bottom of pile cap) :			
(a)	300 mm dia piles	RM	1791.00	
(b)	400 mm dia piles	RM	2279.00	
(c)	450 mm dia piles	RM	2531.00	
(d)	550 mm dia piles	RM	2802.00	
4320	Extra over item No. 4319 for providing additional bulb in under reamed piles, under specified dia meter (Only the quantity of extra bulbs are to be paid).			
(a)	300mm dia piles.	RM	1038.00	
(b)	400mm dia piles.	RM	1183.00	
(c)	450 mm dia piles.	RM	1270.00	
(d)	550 mm dia piles	RM	1416.00	
4321	Providing, driving and installing driven Pre-cast reinforced cement concrete piles of specified diameter and length below the pile cap in M35 cement concrete to carry safe working load not less than specified. With a central through preformed hole with M.S. black pipe of dia, 40mm forgrouting with cement sand grouting of mix 1:2 (1 cement : 2 coarse sand) under sufficient positive pressure to ensure complete filling including centring, shuttering, driving and removing the steel casing pipe and lifting casing etc. complete but excluding the cost of steel			

Item No.	Item	Unit	Rate	Remarks
	reinforcement. (Length of pile for payment shall be measured from top of the shoe to the bottom of pile cap).			
(a)	400 mm dia piles.	RM	1566.00	
(b)	450 mm dia piles.	RM	1772.00	
(c)	500 mm dia piles	RM	1893.00	
(d)	550 mm dia piles.	RM	2083.00	
4322	Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge.			
(a)	Single pile upto 50 tonne capacity Initial test.	Per test	22035.00	
(b)	Single pile upto 50 tonne capacity Routine test	Per test	12995.00	
(c)	Single pile above 50 tonne and upto 100 tonne capacity Initial test.	Per test	31075.00	
(d)	Single pile above 50 tonne and upto 100 tonne capacity Routine test	Per test	20340.00	
(e)	Group of two or more piles upto 50 tonne capacity Initial test.	Per test	42375.00	
(f)	Group of two or more piles upto 50 tonne capacity Routine test	Per test	25990.00	
4323	Cyclic vertical load testing of pile in accordance with IS Code of practice IS : 2911 (part IV) including preparation of pile head etc for			
(a)	Single pile Upto 50 tonne capacity pile.	Per test	12995.00	
(b)	Single pile Above 50 tonne and upto 100 tonne capacity pile	Per test	20340.00	
(c)	Group of two piles Upto 50 tonne capacity pile.	Per test	25990.00	
4324	Lateral load testing of single pile in accordance with IS Code of practice IS : 2911 (Part IV) for determining safe allowable lateral load on pile :			
(a)	Upto 50 tonne capacity pile	Per test	12995.00	
(b)	Above 50 tonne and upto 100 tonne capacity pile	Per test	20340.00	

Item No.	Item	Unit	Rate	Remarks
HORTICULTURE & LANDSCAPING				
4325	Trenching in ordinary soil upto a depth of 60cm including removal and stacking of serviceable materials and then disposing of by spreading and neatly levelling with in a lead of 50m and making up the trenched area to proper levels by filling with earth or earth mixed with sludge or/and manure before and after flooding trench with water (excluding cost of imported earth, sludge or manure).	cum	69.00	
4326	Supplying and stacking of good earth at site including royalty, loading, unloading and carriage upto 100m (earth measured in stacks will be reduced by 20% for payment).	cum	107.00	
4327	Supplying and stacking sludge at site including royalty, loading, unloading and carriage upto 100m (sludge measured in stacks will be reduced by 8% for payment).	cum	104.00	
4328	Supplying and stacking at site well decayed cow dung manure from approved source, including loading, unloading and carriage upto 100m (manure measured in stacks will be reduced by 8% for payment	cum	104.00	
4329	Rough dressing the trenched ground including breaking clods	sqm	0.35	
4330	Uprooting weeds from the trenched area after 10 to 15 days of its flooding with water including disposal of uprooted vegetation	sqm	1.00	
4331	Fine dressing the ground	sqm	0.70	
4332	Spreading of sludge, dump manure or/and good earth in required thickness (Cost of sludge, dump manure or/ and good earth to be paid separately).	cum	11.00	
4333	Mixing earth and sludge or manure in proportion specified or directed	cum	7.00	
4334	Grassing with 'Doob' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for mowing including supplying good earth if needed (the good earth shall be paid for separately).			
(a)	In rows 15 cm apart in either direction	sqm	1.00	

Item No.	Item	Unit	Rate	Remarks
(b)	In rows 7.5 cm apart in either direction	sqm	1.65	
(c)	In rows 5 cm apart in either direction	sqm	3.30	
4335	Renovating lawns including weeding, cheeling the grass, forking the ground, top dressing with sludge or manure, mixing the same with forked soil, watering and maintaining the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for mowing and disposal of rubbish as directed, including supplying good earth if needed but excluding the cost of sludge or manure (the good earth shall be paid for separately).	sqm	6.60	
4336	Uprooting rank vegetation and weeds by digging the area to a depth of 60cm removing all weeds and other growth with roots by forking repeatedly, breaking clods, rough dressing, flooding with water, uprooting fresh growths after 10 to 15 days and then fine dressing for planting new grass, including disposal of all rubbish with all leads and lifts.	sqm	11.20	
4337	Preparation of beds for hedging and shrubbery by excavating 60cm deep and trenching the excavated base to a further depth of 30cm, refilling the excavated earth after breaking clods and mixing with sludge or manure in the ratio of 8:1 (8 parts of stacked volume of earth after reduction by 20% : one part of stacked volume of sludge or manure after reduction by 8%), flooding with water, filling with earth if necessary, watering and finally fine dressing, levelling etc.including stacking and disposal of materials declared unserviceable and surplus earth by spreading and levelling as directed,within a lead of 50m lift upto 1.5 m complete (cost of sludge, manure or extra earth to be paid for separately).	cum	69.00	
4338	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure,			

Item No.	Item	Unit	Rate	Remarks
	sludge or extra good earth if needed to be paid for separately			
(a)	Holes 1.2 m dia and 1.2 m deep	each	164.00	
(b)	Holes 0.6 m dia and 0.6 m deep	each	20.00	
4339	Half brick circular tree guard in modular well burnt clay bricks of crushing strength not less than 25kg/ sqcm, internal diameter 1.25 metre and height 1.2 metre above ground and 0.20 m below ground bottom two courses laid dry and top three courses in cement mortar 1:6 (1 cement : 6 fine sand) and the intermediate courses being in dry honey comb masonry as per design complete:	each	705.00	
4340	Providing and fixing M.S. flat iron tree guard 60cm dia. and 2m height above ground level formed of 4 nos.25x6mm and 8 nos. 25x3mm vertical M.S. flats rivetted to 3 nos. 25x6mm M.S. flat iron rings in two halves, bolted together with 8mm dia. and 30mm long bolts including painting two coats with paint of approved brand and manufacture over a coat of priming, complete in all respects.	each	1962.00	
4341	Making tree guard 53 cm dia. and 1.3 m high as per design from empty coal tar drums supplied free by the department including providing and fixing 2 nos. M.S. sheet rings 50 x 0.5 mm with rivets complete in all respects including painting inside and outside of tree guard with :			
(a)	coat of coal tar.	each	301.00	
(b)	Two or more coats of synthetic enamel paint of approved quality shade over a priming coat	each	301.00	
4342	Making tree guard 53 cm dia. and 2 m high as per design from empty coal tar drums supplied free by the department including providing and fixing four legs 40 cm long of 30 x 3 mm M.S. flat riveted to tree guard and providing and fixing 2 nos. M.S. sheet rings 50 x 0.5 mm with rivets complete in all respects including painting inside and outside of tree guard with :			
(a)	coat of coal tar.	each	385.00	

Item No.	Item	Unit	Rate	Remarks
(b)	Two or more coats of synthetic enamel paint of approved quality and shade over a priming coat.	each	568.00	
4343	Edging with bricks laid dry length wise including excavation, refilling, consolidating with hand packing and spreading neatly surplus earth within a lead of 50 m	meter	16.00	
4344	Filling mixture of earth and sludge or manure in the desired proportion in trenches, flooding with water and levelling (cost of supplying earth and sludge or manure and mixing excluded).	cum	43.00	
4345	Excavation in dumped stones or malba including stacking of serviceable and unserviceable material separately and disposal of unserviceable material lead upto 50 m and lift upto 1.5 m disposed material to be neatly dressed	cum	92.00	
4346	Excavation in bajri path including stacking of serviceable and unserviceable material lead upto 50 m and lift upto 1.5 m disposed material to be neatly dressed	cum	105.00	
4347	Excavation in water bound macadam road including stacking the serviceable and unserviceable material separately and disposal of unserviceable material lead upto 50 m and lift upto 1.5 m disposed material to be neatly dressed	cum	131.00	
4348	Flooding the ground with water including making kiaries and dismantling the same	100 sqm	66.00	
4349	Providing and fixing 12mm thick Pre-laminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade I Type II, in panelling fixed in aluminium doors, windows shutters and partition frames with C.P. brass/ stainless steel screws etc. complete.			
(a)	With decorative lamination on one side and balancing lamination on other side	sqm	795.00	

Item No.	Item	Unit	Rate	Remarks
4350	Providing and fixing 12mm thick Pre-laminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade I Type II, in panelling fixed in aluminium doors, windows shutters and partition frames with C.P. brass/ stainless steel screws etc. complete.			
(a)	With decorative lamination on Both side	sqm	906.00	
4351	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with PVC/ neoprene gasket tc.complete. (Cost of aluminium snap beading shall be paid in basic item):			
(a)	With float glass panes of 4 mm thickness	sqm	596.00	
(b)	With float glass panes of 5.5 mm thickness	sqm	702.00	
4352	Finishing with epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including priming coat with epoxy primer, preparation of surface, etc. complete.	sqm	106.00	
4353	Painting with aluminium paint on new work (two or more coats) on rain water, soil waste, vent pipes and fittings over and including a priming coat of red oxide zinc chromate primer:			
(a)	50 mm diameter pipes.	Metre	11.00	
(b)	75 mm diameter pipes.	Metre	15.00	
(c)	100 mm diameter pipes	Metre	20.00	
(d)	150 mm diameter pipes	Metre	30.00	
4354	Painting with black anticorrosive bitumastic paint on old work (one or more coats) on rain water, soil waste, vent pipes and fittings:			
(a)	50 mm diameter pipes.	Metre	3.00	
(b)	75 mm diameter pipes.	Metre	5.00	
(c)	100 mm diameter pipes	Metre	6.00	
(d)	150 mm diameter pipes	Metre	9.00	
4355	Coal tarring two coats on new work using 0.16 and 0.12 litre coal tar per sqm in the first and second coat respectively.	Sqm	8.00	
4356	Applying priming coat on steel work with red oxide primer	Sqm	15.00	

Item No.	Item	Unit	Rate	Remarks
4357	Painting on new work (two or more coats) to give an even shade with:			
(a)	Satin synthetic enamel paint	Sqm	59.00	
4358	Painting on new work (two or more coats) to give an even shade with			
(a)	Aluminium paint	Sqm	44.00	
4359	Painting on new work (two or more coats) to give an even shade with			
(a)	Acid proof paint	Sqm	47.00	
4360	Painting on new work (two or more coats) to give an even shade with			
(a)	Black anti-corrosive bitumastic paint	Sqm	28.00	
4361	Floor painting with superior quality enamel paint to give an even shade.			
(a)	On new work (two or more coats)	Sqm	47.00	
4362	Providing and laying french spirit polish on new wood work after preparing the surface by rubbing down smooth with sand papers, covering the knots, if visible, applying a coat of wood filler, cleaning the surface, applying 50 or more coats of french spirit polish till the surface gives high gloss.	sqm	91.00	
4363	Flooring polishing with superior quality wax polish of approved brand and manufacture	sqm	23.00	
4364	Lettering with black Japan paint, per cm height.	Per cm height	0.50	
4365	Applying one coat of cement primer on wall surface	sqm	16.00	
4366	Providing and applying 2mm thick ready mix exterior grade putty (Birla wall care, Alltek Superfine W/R of (NCL), J.K. wall putty) on walls to make the surface smooth and even.	sqm	42.00	
4367	Providing and laying 27 mm thick washed stone grit plaster on exterior walls of height upto 10m above ground level in two layers, under layer 15mm thick plaster in cement mortar 1:4 (1 cement : 4 fine sand) furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per sqm, top layer 12mm thick cement concrete 1:1 (1	sqm	234.00	

Item No.	Item	Unit	Rate	Remarks
4368	<p>Cement: 1 Marble stone chips by weight 10mm nominal size) in panels with groove (size 1cm. x1cm) all around as per approved pattern including scrubbing and washing the top layer with brushes and water to expose the stone chippings complete (Payment for providing grooves shall be made separately).</p> <p>Providing and laying brush concrete flooring of 12mm thick cement concrete (1 cement :2 black metal, 6mm size) mixed with granite pigment of approved quality in a ratio of 2.08 kg/sq meter are laid over & including a base of 40mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm size) with 12.50 mm size graded B.T metal mechanically mixed including neat cement finish over granite with red colour pigment including glass strip of size 45x3 mm including glass strip of size 45x3 mm including cost of all material & labor etc. complete.</p>	sqm	250.00	