GOVERNMENT OF MADHYA PRADESH

DEPARTMENT OF URBAN ADMINISTRATION & DEVELOPMENT

INTEGRATED STANDARD SCHEDULE OF RATES

(VOLUME II)

BUILDING WORKS

IN FORCE FROM

10th MAY, 2012

COMMISSIONER

URBAN ADMINISTRATION AND DEVELOPMENT

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FOREWORD

India is part of the global trend of increasing urbanisation. The urban population in India has increased by 5 times as compared to the overall population growth of 2.5 times during last 5 decades. As per 2001 census, 27.8% of India's population lived in 4378 towns/ cities. This share increased to 31.16% in Census 2011. Urbanization in Madhya Pradesh has also expanded rapidly. As per provisional figures of Census 2011, in Madhya Pradesh, 27.63% of the population lives in towns and cities.

Cities hold tremendous potential as engines of socio-economic development, creating jobs and generating wealth through economies of scale. They need to be sustained and augmented through the high urban productivity for country's economic growth. For cities to become growth oriented and productive, it is essential to achieve a world class urban system. This, in turn, depends on attaining efficiency and equity in the delivery and financing of urban infrastructure.

74th Constitutional Amendment Act created a focus on improving and strengthening Urban infrastructure and Services in Urban Local Bodies. With the availability of substantial funds from various sources and with our own increased revenues, availibility of development funds is no longer a major constraint. However, tapping these sources effectively is a major concern.

While preparing Detailed Project Reports, accurate Cost estimation is one of the most important and challenging aspects. Till 31st May 2011, in the absence of Departmental Schedule of Rates, Urban Local Bodies had to depend on Schedule of Rates of various Works Departments of the State Government such as MP Public Health Engineering Department, MP Public Works Department, Water Resource Department etc. for civil works and Madhya Pradesh State Electricity Board for electrical works. The infrastructure and maintenance works done by our Urban Local Bodies are town specific as well as need specific. The SoRs of these departments do not contain many such items.

Looking to the problems faced by the ULBs in cost estimation, Department of Urban Administration and Development decided to develop its own Integrated Standard Schedule of Rates for all Building and other Infrastructure works keeping in view the current and future requirements of the Urban Local Bodies and to provide them effective tool for preparing accurate cost estimates. The Department prepared and adopted its first Integrated Standard Schedule of Rates in four volumes along with related specifications, on 1st June 2011.

The prices are ever changing. To accommodate the annual price rise, Department intends to update the ISSR annually. We are extremely happy that the Department, with

the able assistance of Project Utthan, Madhya Pradesh Urban Services for the Poor (MPUSP), a DFID assisted programme, has not only successfully completed the task of ISSR preparation but also has updated the ISSR well within time.

To complete this task, a Working Group was formed which deliberated about the new items and revisions required by Urban Local Bodies to carry out the infrastructure development and construction works smoothly.

An Output Review Panel was also constituted to review the process outputs and finalize various reports including Rate Analysis for various items under Integrated Standard Schedule of Rates.

The updated ISSR has been prepared in four parts i.e. Volume - 1 Water Supply, Sewerage & Tube well works, Volume - 2 Building works, Volume - 3 Roads & Bridges works, Volume - 4 Municipal Electrical works. Specifications for various works have also been illustrated in four separate volumes.

All the volumes of the ISSR along with the applications are also available on the Website of UADD (mpurban.gov.in). This will help the Urban Local Bodies in preparing cost estimates reflecting prevailing market values and hence, avoid high tender rates.

I extend my sincere thanks to all the members of Working Group and the Output Review Panel for taking keen interest in completing the voluminous job of updation & completion of ISSR well in time.

I am sure that this Updated Integrated Standard Schedule of Rates will be quite useful for all the Urban Local Bodies of Madhya Pradesh to prepare accurate cost estimates in Detailed Project Reports.

(Sanjay Kumar Shukla)
Commissioner
Urban Administration and Development
Government of Madhya Pradesh
Bhopal

MEMBERS OF WORKING GROUP

1.	Shri Ashok Khare, Chief Engineer, Directorate of Urban Administration and Development, Bhopal	Chairman
2.	Shri S.K. Sogani, Superintending Engineer, UADD, Indore	Member
3.	Shri J.M. Dagaonkar Superintending Engineer, Municipal Corporation, Ujjain	Member
4.	Shri H.K. Jain Superintending Engineer, Municipal Corporation, Indore	Member
5.	Shri Pawan Sharma, Executive Engineer, UADD, Jabalpur	Member
6.	Shri S.K. Devgan Deputy City Engineer, Municipal Corporation, Bhopal	Member
7.	Shri B.K. Sonwani, Executive Engineer, UADD, Sagar	Member
8.	Shri A.G. Khan, Executive Engineer, UADD, Bhopal	Member
9.	Shri Alok Chokse, Executive Engineer, UADD, Rewa	Member
10.	Shri Pradeep Nigam, Executive Engineer, UADD, Indore	Member
11.	Shri Anand Singh, Executive Engineer, Directorate of UAD	Member
12.	Shri Kamlesh Bhatnagar, Engineer, Project Utthan, Municipal Support Unit, MPUSP, Urban Administration and Development, Bhopal	Member
13.	Shri Rakesh Rawat, Assistant Engineer, Municipal Council, Vidisha	Member
14.	Shri P.P. Kaithwas, Assistant Engineer, Municipal Council, Neemuch	Member
15.	Shri Suresh Sejkar, Executive Engineer, Directorate of Urban Administration and Development, Bhopal	Member Secretary

MEMBERS OF OUTPUT REVIEW PANEL

1.	Shri Ashok Khare, Chief Engineer, Directorate of Urban Administration and Development, Bhopal	Chairman
2.	Shri M.J.S Tulsi, Deputy Director (Engineering), Project Utthan, Municipal Support Unit, MPUSP, Urban Administration and Development, Bhopal	Convener
3.	Shri Kamlesh Bhatnagar, Engineer, Project Utthan, Municipal Support Unit, MPUSP, Urban Administration and Development, Bhopal	Member

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GENERAL NOTES

1 The SOR of UADD Department consists of 4 Volumes

VOLUME - I Water Supply, Sewerage & Tube Well Works
VOLUME - II Building Works
VOLUME - III Road & Bridge Works
VOLUME - IV Electrical Works

2 The contents of each Volume are given below

VOLUME - I
WATER SUPPLY, SEWERAGE AND TUBE WELL WORKS

1	Cast Iron Pipes and Specials with with Socket & Spigot lead joints.
2	Cast Iron Tyton Pipes with Tyton Joints.
3	Cast Iron Pipes and Specials with flanged joints.
4	Ductile Iron Pressure Pipes and Special with Tyton joints.
5	Unplasticized PVC Pipes & Fittings for potable water supply.
6	Cast Iron Valves.
7	Galvanised Iron Pipes, Specials and Gun Metal/Brass Metal Fittings.
8	HDPE Pipes, MDPE Pipe & Specials and Zero Velocity Valves.
9	GRP Pipes and Specials.
10	Asbestos Cement Pressure Pipe and Cast Iron Fittings.
11	Salt Glazed Stoneware Pipes.
12	Unplasticized Non-Pressure Polyvinyl Chloride (PVC-U) Pipes, DWC Pipes for use in underground sewerage system.
13	Reinforced Cement concrete Pipes.
14	Sewer Appurtenances.
15	Civil Works for Water Supply & Sewerage works.
16	Miscellaneous.
17	Drawings for Water Supply & Sewerage.
18	Drilling of Tube Wells.

VOLUME - II
BUILDING WORKS

1	Carriage of Material
2	Earth work
3	Mortars
4	Concrete work
5	Reinforced Cement Concrete
6	Brick work
7	Stone work
8	Marble Work Other Than Flooring
9	Wood Work & P.V.C. Works
10	Steel work
11	Flooring
12	Roofing and Ceiling
13	Finishing
14	Repair to Building
15	Dismantling & Demolishing
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18	Water proofing
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20	Form Work
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22	Rainwater Harvesting, Recycle and Reuse wastewater
23	Building Water Supply
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25	Sanitary Installation

VOLUME - III

ROAD & BRIDGES WORKS

ROAD	
1	Carriage of Material
2	Site Clearance
3	Earth work, Erosion control and Drainage
4	Sub-Bases, Bases (Non-Bituminous) and Shoulders
5	Bases and Surface courses (Bituminous)
6	Cement Concrete Pavements
7	Geosynthetics and Reinforced Earth
8	Traffic Signs, Marking & other Road Appurtenances
9	Supply of Material
10	Maintenance of Roads
11	Horticulture
12	Survey & Investigation, Preparation of D.P.R. and other Miscellaneous items
BRIDGE	
13	Foundations
14	Sub-Structure
15	Super-Structure
16	River Training and Protection works
17	Repair and Rehabilitation

VOLUME - IV

ELECTRICAL WORKS

PART – 1 – INTERNAL ELECTRIFICATION

1	Wiring in surface /concealed rigid P.V.C. conduit system.
2	Wiring in surface /concealed rigid Steel conduit system.
3	Wiring in surface rigid P.V.C. casing capping system
4	Wiring in existing/conduit/P.V.C. casing capping system
5	Sub Mains in surface/concealed rigid steel conduit system.
6	Rewiring in existing conduit.
7	Control switch gear/Bus bar.
8	MCCB's, Isolators, MCB's, MCB-DB and fixing.
9	Accessories/Pannel/Lamp/Telephone wires/Fens/Luminaries.
10	Miscellaneous
11	Earthing
12	Dismantiling of Civil and Electrical Works

PART – 2 – EXTERNAL ELECTRIFICATION

13	External Electrification and Over head lines
14	Power Cable & laying
15	Transformers. & Fire Extinguishers
16	High Mast
17	Pump Sets with G.I. Pipe
18	Solar street light system
19	Supply of Materials

3 Rate for completed items include the cost of following :-

3.1 All material, labour, workmanship, templates, tools, hire and running charges of plants & machinery required to complete the work, unless specified otherwise.

3.2 All lead & lift of materials required for execution of work inclusive of charges like duties, tax, royalty etc.

3.3 Provision for erection, removal of centering form works, scaffolding, benching, ladders and all other applications etc, required for execution of the work, unless otherwise specified.

3.4 Provision for necessary covering to protect the work/structure from inclement weather etc. and damage arising from falling of materials or rains, fire etc shall be the responsibility of the contractor.

3.5 Curing wherever required including arrangement of water and also including its lead or lift whatsoever.

4 The mode of measurements shall be as per provisions contained in the relevant chapters and in specifications/relevant IS codes.

5 All materials shall conform to the relevant prevailing Indian Standard Specifications. All material before use in works shall require approval of the Engineer in charge, who will get them sampled, tested as per relevant IS code at contractor's cost and samples so approved shall be kept in the office of the concerned Engineer-in-charge till finalization of the work.

6 Material obtained from excavation shall be the property of the Local body (Municipal Corporation, Municipal Council & Nagar Panchayat).

7 Hard Rock available from excavation, shall be used for conversion into coarse aggregates or for other construction material and shall be issued to the contractor on the rate as decided by competent authority.

8 **Cement :-**

8.1 Where contract provides for cement to be arranged by the Contractor himself, only I.S.I. Marked cement as per IS for 33 grade cement, IS 269 for 43 grade cement, IS 8112 for 53 grade cement, IS 12269 for Portland Pozzolana cement, IS 1489 Part - I & II specifications shall be allowed to be used in the work subject to the prescribed tests.

8.2 Make of cement shall be got approved by the Engineer-in-charge. The engineer in charge shall get cement tested as per relevant IS codes, at the cost of the contractor, before use in work.

8.3 Pozzolona cement is now being widely produced all over the country. This may be used in structures as per provisions of IS code.

8.4 When the strength of concrete required upto M-30, then O.P.C. 33 grade conforming to IS 269-1989 or P.P.C. conforming to IS : 1489-1991 may be used.

8.5 When the strength of concrete required is more than M-30, the O.P.C. 43 grade conforming to IS : 8112-1989 shall be used.

8.6 For prestressed concrete works where the strength of concrete required is more than M-30, then O.P.C. 53 grade cement conforming to IS : 12269-1987 shall be used.

8.7 In specific cases requiring higher grade of strength, use of Ordinary Portland Cement (OPC) should be invariably ensured.

8.8 The arrangement for necessary equipment and testing shall have to be made by the contractor himself at site, as decided by the Engineer-in-Charge. All expenses shall be borne by the contractor.

8.9 Any lot of cement brought to site by the contractor, would be permitted to be used in the work only after the satisfactory results of the tests, under the supervision of the Engineer-in-Charge or his authorised representative. The record of the test results shall be maintained in register mentioned in subsequent para.

8.10 A duplicate register as prescribed by the competent authority of technical authority shall be maintained at the site of the work. Extract certified copies of the entries for each month shall be submitted to the Engineer-in-Charge by the Contractor.

8.11 The original register shall also be submitted to the Engineer-in-Charge on completion of the work by the Contractor.

9 **Steel :-**

9.1 Steel used for reinforcement shall conform as per under :-

(a) Mild Steel and medium tensile steel bars shall conform to IS : 432 (Part-I),
(b) Hot rolled deformed bars shall conform to IS : 1139,
(c) Cold twisted bars shall conform to IS : 1786,
(d) Hard drawn steel wire fabric shall conform to IS : 1566 and
(e) Rolled steel made from structural steel shall conform to IS : 226.

9.2 All reinforcement shall be free from loose mill scales, loose rust and coats of paints, oil, mud or other coatings which may destroy or reduce bond.

9.3 Only such steel obtained from main producers of steel i.e. SAIL, IISCO, TISCO or such steel rolling mills as having licence from the B.I.S. to manufacture such steel for reinforcements, shall be allowed to be used in the work. The make of the steel shall be approved by engineer-in-charge.

9.4 The Contractor shall have to produce Test Certificate in the proforma prescribed approved by B.I.S. from the manufacturer for every batch of steel brought to the site of work.

9.5 Before commencement of use of steel, from any batch brought to site the of the work by the contractor, the Engineer-in-Charge shall arrange to get samples tested for nominal mass, tensile strength, bend test and rebend test from any Laboratory of his choice at the cost of Contractor. The selection of test specimens and frequency shall be as per relevant I.S. specification of the steel used.

10 If any item of work is found not upto the prescribed standard but the Engineer-in-charge is of the opinion that the same is structurally adequate and can be accepted at a reduced rate, then in such case, the Engineer-in-charge shall submit proposal for the same, supported by an analysis in justification thereof, through proper channel to the Superintending Engineer UADD to obtain his approval expeditiously (ordinarily within 15 days). The approved analysis along with orders of the Superintending Engineer should be appended to the final bill of the contractor.

11 In case of any contradiction in the provisions of the specifications and this schedule of rates, the decision of Chief Engineer, UADD will be of precedence.

12 (a) Rates of items would apply for work order/piece work system also.
(b) Rates payable for any work to be done departmentally then rates should be reduced by 10.434% (contractor profit percentage 10% + T&P charge 2%) i.c. 100x12/115 = 10.434%.

13 **Interpretations** :- The Chief Engineer, UADD, Bhopal shall be the sole deciding Authority as to the meaning, interpreation and implications of various provisions in this schedule of rates. His decision shall be final and binding on all concerned.

14 **Safety** :- The contractor shall be fully and solely responsible for making all the safety arrangements pertaining to the work. The contractor shall be fully responsible and liable in all respects for any accidents and subsequent legal action initiated by any party including the department.

15 Latest I.S. Codes with upto date amendments shall be applicable.

16 **Concrete Work : -**

16.1 Testing of Concrete :- The concrete shall be sampled in accordance with the norms specified in IS 456. The frequency of sampling is given below.

Quantity of Concrete in the Work m^3	Number of Samples
1 - 5	1
6 - 15	2
16 - 30	3
31 - 50	4
51 and above	4 plus one additional sample for each additional $50m^3$ or part thereof.

Note:
(i) At least one sample shall be taken from each shift.

(ii) Where concrete is produce as continuous production unit, such as ready mix concrete plant. The frequency of sampling may be agreed upon mutually by suppliers and purchasers.

16.2 **Test specimen**

Three test specimen shall be made for each sample for testing at 28 days. Additional samples may be required for various purposes such as to determine the strength of concrete at 7 days or at the time of striking the formwork, or to determine the duration of curing, or to check the testing error. Additional samples may also be required for testing samples cured by accelerated methods as described in IS 9103. The specimen shall be tested as described in IS 516.

16.3 Nominal mix concrete may be used for concrete for M-20 or lower. The proportions of material for nominal mix concrete shall be in accordance with the table given below: -

Grade of Concrete	*Total Quantity of Dry Aggregates by Mass per 50 kg of cement, to be taken as the Sum of the Individual Masses of Fine and Coarse Aggregates, Kg. Max*	*Proportion of Fine Aggregate to Coarse Aggregate (by Mass)*	*Quantity of Water per 50 kg of Cement, max Ltr*
(1)	*(2)*	*(3)*	*(4)*
M5	800	Generally 1:2 but subject to an upper limit of 1:1½ and a lower limit of 1:2 V2	60
M7.5	625		45
M10	480		34
M15	330		32
M20	250		30

Note:-

The proportions of the fine to coarse aggregate should be adjusted from upper limit to lower limit progressively as the grading of fine aggregate become finer and the maximum size of coarse aggregate becomes lower. Granded coarse aggregate shall be used.

16.4 Design mix concrete is preferred to nominal mix. If design mix concrete can not be used for any reason on the work for grades of M-20 or lower. Nominal mixes may be used with the permission of Engineer in charge, which, however, is likely to involve a higher cement content.

17 **Best** shall mean that in the opinion of the concerned Engineer-in-Charge, there is no superior material or article or class of workmanship obtainable in the market.

18 The labour only provided in the Schedule of Rates includes the cost of all labour including necessary handling of the materials at site of work and all workmanship. The labour rates adopted for preparation of S.O.R. are inclusive of provision for weekly holiday.

Extra Notes for Building Works

1 The rates for completed items in the schedule of rates include the following.

1 2% for T&P
2 3% for over head charges
3 10% for contractor's profit
4 1% water charges

2 If there is any sources of water like tube well,hand pump,well etc.under Govt./ local body custody and if water from this source is used for construction activity by the contractor then water charge shall be deducted at the rate of 1% of the amount paid to the contractor from the item involving the use of water.

3 The rates also include the element of testing of samples of various materials brought by the contractor for use on the work, as well as other necessary tests for items of work as stipulated in the specifications. Frequency of such tests to be carried out must not be less than the prescribed frequencies. Copies of registers, containing records of tests shall have to be presented along with running account bills. Register (original) shall have to be submitted along with the final bill. Tests shall have to be conducted by the contractor's Engineer under the supervision of the Engineer-in-Charge or his authorised representatives. The contractor shall have to establish a field laboratory at the site of work, if the amount of contract exceeds Rs.25.00 lakhs. In other cases, testing of construction materials should be got done from any of the tests laboratories of the various Government Departments, Government/Semi Govt. under takings and Technical Institutes, Engineering College, Polytechnic, I.T.I. recognized and authorized lab.

3.1 The work should not be accepted in any case, if the contractor fails to observe the instructions of the department, regarding testing of materials.

3.2 Before making any payment, it will be the responsibility of the officers making payment to assure that all tests as per prescribed frequencies, have been carried out, and found as per requirement.

3.3 If tests are not conducted to the prescribed frequency, the Engineer in- Charge should reject that part of the work.

4 IS 1200 shall be referred for building measurement.

1.00 CARRIAGE OF MATERIALS			
Item No.	**Descriptions**	**Unit**	**Rate (in Rs)**
	Loading and unloading of stone boulder / stone aggregates / sand / kanker / moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)		
	(Volume to be computed as per provisions of IS:1200.		
1.1	Transportation of metal 20 mm		
i)	For a lead upto 1 Km.	Cum	73.00
ii)	For a lead upto 2 Km.	Cum	81.00
iii)	For a lead upto 3 Km.	Cum	88.00
iv)	For a lead upto 4 Km.	Cum	95.00
v)	For a lead upto 5 Km.	Cum	102.00
vi)	Beyond 5 Kms. and upto 10 Kms. (Add for every 1 Km)	Cum	6.00
vii)	Beyond 10 Kms. and upto 20 Kms. (Add for every 1 Km)	Cum	5.00
viii)	Beyond 20 Kms. and upto 50 Kms. (Add for every 1 Km)	Cum	4.00
ix)	Beyond 50 Kms. (Add for every 1 Km)	Cum	3.00
1.2	Transportation rate of different other material in comparison with 20 mm metal. (i.e. @ Rs. 48.81 Per Cum)		**Rate as % of metal**
a)	Marble, Kota Stone	Cum	18%Above
b)	Masonry Stone	Cum	18 % Above
c)	Rubble	Cum	18 % Above
d)	Loose moorum/sand/earth/surkhi.	Cum	As Metal
e)	Excavated Earth	Cum	25 % Above
f)	Excavated ordinary rock measured	Cum	100 % Above
g)	Cement	Tonne	11 % Below
h)	Steel	Tonne	11 % Below
i)	Timber/ ballies /planks/scantalies.etc	Cum	14 % Above
j)	Coal /fuel ,Iron work / steel / G.I.Sheets / pipes / lime / machinery etc.	Tonne	11 % Below
k)	150mm dia ballies	Cum	14 % Above
l)	Tar/paints/Bitumen etc.	Cum	As Metal

1.3	Transportation by trucks on hire		
i)	Loading of trucks	Cum	26.00
ii)	Unloading of trucks and stacking.	Cum	26.00
iii)	Trucks hired for full load excluding loading/unloading and stacking for items not covered above for distances :		
	a) Upto 15 Kms.	Cum	47.00
	b) Beyond 15 Kms. and upto 50 Kms. add extra over a) above	Cum	31.00
	c) Beyond 50 Kms. add extra over b) above.	Cum	28.00
1.4	Unloading and stacking etc. at the railway yard from wagons.		
a)	Cement	M.T.	43.00
b)	Iron/steel/G.I. Sheet/pipes/machinery	M.T.	37.00

2. EARTH WORK

Notes for Specification :-

IS Codes

IS 632 : Gamma - BHC (Lindane) emulsifiable concentrates
IS 1200 (Pt1): Method of measurement of earth work
IS1200(Pt-27): Method of measurement of earth work (by Mechanical Appliances)
IS 4081: Safety code for Blasting and related drilling operation
IS 4988 (Part IV): Excavators
IS6313(pt"ll): Anti Termite measures in buildings (pre -constructional)
IS6313(pt.-lll) : Anti Termite Measures in Buildings for existing buildings
IS 6940: Methods of test for pesticides and their formulations
IS 8944 : Chiorpyrifos emulsifiable concentrates
IS 8963 : Chiorpyrifos ~ Technical specifications
IS 12138 : Earth moving Equipments

1 CLASSIFICATION OF EXCAVATED STRATA

a. All kind of soils: Generally any strata, such as sand, gravel, loam, clay, mud, black cotton moorum, shingle, river or nalla bed boulders, siding of roads, paths etc. and hard core, macadam surface of any description (water bound, grouted tarmac etc.), lime concrete mud concrete and their mixtures which for excavation yields to application of picks, showels, jumper, scarifiers, ripper and other manual digging implements. Removal of gravel or any other nodular material having dimensions in any one direction not exceeding 300mm occurring in such soil shall be deemed to be covered under this category.

b Ordinary rock: Generally any rock which can be excavated by splitting with crow bars or picks and does not require blasting, wedging or similar means for excavation such as lime stone, sand stone, hard literate, hard conglomerate and un-reinforced cement concrete below ground level.

If required light blasting may be resorted to for loosening the materials but this will not in any way entitle the material to be classified as 'Hard rock'.

Boulders which do not require blasting having maximum dimension in any direction of more than 300 mm,found laying loose on the surface or embedded in river bed, soil, talus, slope wash and terrace material of dissimilar origin.

c Hard Rock (Requiring Blasting) : This shall comprise Granites, Basalt and similar rocks/boulder, reinforced cement concrete for the excavation of which the use of mechanical plant and or blasting is required below ground level.

d. Excavation in Rocks, where blasting is prohibited : Hard rock requiring blasting but where blasting is prohibited for any reason and excavation has to be carried out by chiseling, wedging or any other agreed method.

2 BLASTING OPERATIONS

Blasting shall be carried out in a manner that completes the excavation to the lines and levels as indicated in the drawings with the least disturbance to adjacent material. It shall be done only with the written permission of the Engineer-in-Charge. All statutory laws, regulations, rules etc. pertaining to the acquisition, transport, storage, handling and use of explosives shall be strictly followed. The contractor may adopt any method or methods of blasting consistent with the safety and job requirements. Prior to starting any phase of the operation, the contractor shall provide information describing pertinent blasting procedures, dimensions and notes. The magazine for storage of explosives shall be limited to the designs and specifications of the explosive department concerned and located at the approved site. No unauthorised person shall be admitted in to the magazine, which when not in use, shall be kept security locked. No matches or inflamable material shall be allowed in the magazine. Materials, tools, plants, equipments and personnel, deputed on blasting operation, should be approved by Engineer-in-Charge.

3 EXCAVATION IN WATER. MUD OR FOUL POSITION

3 (a) All water that may accumulate in excavations during the progress of the work from springs, or river seepage, broken water mains or drains (not due to the negligence of the contractor), and seepage from subsoil aquifer shall be bailed, pumped out or otherwise removed. The contractor shall take adequate measures for bailing and/or pumping out water from excavations and/or pumping out water from excavations and construct diversion channels, bunds, sumps, coffer dams etc. as may be required. Pumping shall be done directly from the foundation trenches or from a sump out side the excavation in such a manner as to preclude the possibility of movement of water through any fresh concrete or masonry and washing away parts of concrete or mortar. During laying of concrete or masonry and for a period of at least 24 hours thereafter, pumping shall be done from a suitable sump separated from concrete or masonry by effective means.

Capacity and number of pumps, location at which the pumps are to be installed, pumping hours etc. shall be decided from time to time in consultation with the Engineer-in-Charge.Pumping shall be done In such a way as not to cause damage to the work or adjoining property by subsidence etc. Disposal of water shall not cause inconvenience or nuisance in the area or cause damage to the property and structure nearby.To prevent slipping of sides, planking and strutting may also be done with the approval of the Engineer-in-Charge.

3 (b) Classification

The earth work for various classification of soil shall be categorized as under:

3(b) 1 Work in or under water and/or liquid mud: Excavation, where water is met with from any of the sources specified in 3(a) shall fall in this category. Steady water level in the trial pits before the commencement of bailing or pumping operations shall be the sub-soil wafer level in that area.

3(b) 2 Work in or under foul position: Excavation, where sewage, sewage gases or foul conditions are met with from any source, shall fall in this category. Decision of the. Engineer-in-Charge whether the work is in foul position or not shall be final.

3 (c) Measurements

3(c) 1 The unit, namely, meter depth shall be the depth measured from the level of foul position/ sub-soil water level and up to the centre of gravity of the cross sectional area of excavation actually done in the conditions classified in 3(b). Meter depth shall be reckoned correct to 0.1 m, 0.05 m or more shall be taken as 0.1 m and less than 0.05 m ignored. The extra percentage rate is applicable in respect of each item but the measurements shall be limited only to the quantities of earth work actually executed in the conditions classified in 3(b).

3(c) 2 In case earth work in or under foul position is also in or under water and/or liquid mud, extra payment shall be admissible only for the earth work actually executed in or under foul position.

3(c) 3 Pumping or bailing out water met within excavations from the sources specified in 3 (b) where envisaged and specifically ordered in writing by the Engineer-in-Charge shall be measured separately and paid. Quantity of water shall be recorded in kilolitres correct to two places of decimal. This-payment shall be in addition to the payment under respective items of earthwork and shall be admissible only when pumping or bailing out water has been specifically ordered by the Engineer-in-Charge in writing.

3(c) 4 Planking and strutting or any other protection work done with the approval of the Engineer-in-Charge to keep the trenches dry and/or to save the foundations against damage by corrosion of rise in water levels shall be measured and paid for separately.

3(c) 5 Bailing or pumping out water, accumulated in excavation, due to rains is included under respective items of earthwork and is not to be paid separately.

4 Lift is to be calculated on the height of Center of Gravity of lifted materials above Center of Gravity of borrow pit. In measuring lifts no notice will be taken of lifts less than 0.5 M.

5 In measuring lead, distance less than 25 meters will be ignored and 25 meters or above shall taken as 50 meters.

6 Surface dressing comprises training the uneven surface of ground to uniform surface (either horizontal or slopping) by scraping off high patches and filling in low patches with the scraped soil. The Maximum depth of cutting or filling not exceeding 15cm.

7 Dry vegetation earth sand gravel, stone, deserts or brickwork, concrete, masonry etc. obtained from the excavation shall be property of Govt. of M.P. The rates of excavation include the separation of serviceable and unserviceable materials and depositing the serviceable ones in regular heaps.

8 Shoring in wells, foundations and trenches will not be payable without obtaining prior approval of the not below ther rank Executive Engineer.

9 The excavations shall conform to the lines & levels shown in the drawings and as directed by the Engineer-in-Charge. The contractor shall not excavate outside the limits of excavation. Any excess depth/width, excavated beyond the specified levels/dimensions on the drawing shall be made good at the cost of the contractor with the concrete as specified for the foundation.

10 Measurement :-

The length and breadth of excavation or filling shall be measured with a steel tape correct to the nearest cm. The depth of cutting or height of filling shall be measured, correct to 5 mm, by recording levels before the start of the work and after the completion of the work. The cubical contents shall be worked out to the nearest two places of decimal in cubic meters.

In case of open footings up to the depth of 1.5 meters, alround excavation of 30 cm. beyond the outer dimension of footing shall be measured for payment to make allowances for centering and shuttering. Any additional excavation beyond this limit shall be at the risk and cost of the contractor and shall not be measured for payment.

Where it is not possible or convenient to measure the depth of cutting by recording levels ,quantity of excavation shall be worked out from filling. The actual measurements of the fill shall be calculated by taking levels of the original ground before start of the work after site clearance and after compaction of the fill as specified and the quantity of earth work so computed shall be reduced by 10% in case of consolidated fills and by 5% in case the consolidation is done by heavy mechanical machinery to arrive at the net quantity of excavation for payment. No such deduction shall, however, be made in case of consolidation by heavy mechanical machinery at optimum moisture content, or when the consolidated filling is in confined situations such as under floors.

11 Recording Measurements for Earth Levelling Work

Level Books: in case of levelling operations and earthwork, measurements are required to be recorded in level books in addition to Measurement Books. The Level Books should be numbered, accounted for and handled like Measurement Books.

Preparatory Works: Before starting the earth work, following steps should be taken ;

(1) Original ground levels should be recorded in the Level Book in the presence of the contractor or his authorized representative, and should be signed by him and the Department's Officer who records the levels. All the local mounds and depressions should be indicated clearly in the drawing and the field Level Book and should be checked by the Assistant Engineer/Executive Engineer before the levelling work is started.

(2) A suitable baseline should be fixed with permanent masonry pillars at distances not exceeding 150 meters to provide a permanent reference line for facilitating check work. The base line (s) should be entered in the Level Book with co-ordinates.. These baselines should be maintained till the final payment for the work has been made.

(3) While recording the levels, it should be ensured that the circuit is closed by taking final levels of the starting point or any other point, the R.L. of which was previously determined.

(4) Plans showing initial levels, location of bench marks and reduced levels, should be prepared and signed by both the parties and attached to the agreement before commencement of the work.

Test Check of the Levels

(1) The Assistant Engineer should exercise test check at least to the extent of 100%, and the Executive Engineer at least to the extent of 10% where the value of this item of work exceeds 10% of the tender acceptance power of the Assistant Engineer.

(2) The test check of the levels should be carried out independently by each officer, and the readings should be recorded in the prescribed Level Book in red ink against the old levels which should be neatly scored out wherever necessary. If the test check carried out reveals serious mistakes in the original levels, these should be taken or re-taken and re-checked.

(3) The test check carried out by an officer should be as representative as possible for the entire work done.

(4) On completion of work, the levels should again be recorded in the Level Book and the contractor's signatures obtained. These levels should also be test checked by the Assistant Engineer/Executive Engineer to the same extent as indicated in (1) within one month of the date of completion of the earth work, and according to the procedure as laid down in the case of initial levels as indicated above.

(5) The formation levels as per final execution of the work should be compared with the proposed formation levels and the work got rectified within permissible tolerance.

12 Rate includes dressing the pits and dumping excavated materials including dressing dumping as directed by Engineer-in-Charge.

13 Rates: Rates of all items in this chapter are inclusive of the expenses of all labour, materials, T & P and all incidental and other charges required completing the item of work in full and also including hire & running expenses of all machineries required for the work, including stacking of excavated materials as directed where ever required.

14 **ANTIQUITIES AND USEFUL MATERIALS**

Any finds of archaeological interest such as relics of antiquity, coins, fossils or other articles of-value shall be delivered to the Engineer-in-Charge and shall be the property of the local body.

Any material obtained from the excavation which in the opinion of the Engineer-in-Charge is useful shall be stacked separately in regular stacks as directed by the Engineer-in-Charge and shall be the property of the Government.

(For Detail Refer UADD Earth Work specification / CPWD specification)

2. EARTH WORK			
S.No	**Description of Items**	**Unit**	**Rate(in Rs)**
2.1	Earth work in surface excavation not exceeding 30 cm in depth but exceeding 1.5 m in width as well as 10 sqm on plan including disposal of excavated earth upto 50 m and lift upto 1.5 m, disposed soil to be levelled and neatly dressed.		
2.1.1	All kinds of soil	Sqm	27.00
2.2	Earth work in rough excavation,banking excavated earth in layers not exceeding 20cm in depth, breaking clods watering, rolling each layer with ½ tonne roller or wooden or steel rammers,and rolling every 3rd and top-most layer with power roller of minimum 8 tonnes and dressing up in embankments for roads,flood banks,marginal banks and guide banks or filling up ground depressions,lead upto 50 m and lift upto 1.5m		
2.2.1	All kinds of soil	Cum	203.00
2.3	Banking excavated earth in layers not exceeding 20 cm. in depth, breaking clods, watering, rolling each layer with ½ tonne roller, or wooden or steel rammers,and rolling every 3rd and top-most layer with power roller of minimum 8 tonnes and dressing up, in embankments for roads,flood banks, marginal banks,and guide banks etc.,lead upto 50 m and lift upto 1.5 m.		
2.3.1	All kinds of soil	Cum	128.00
2.4	Deduct for not rolling with power roller of minimum 8 tonnes for banking excavated earth in layers not exceeding 20 cm in depth.	Cum	2.00
2.5	Deduct for not watering the excavated earth for banking	Cum	8.00
2.6	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.		
2.6.1	All kinds of soil	Cum	127.00
2.7	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50 m and lift upto 1.5 m, disposed earth to be levelled and neatly dressed.		

S.No	Description of Items	Unit	Rate(in Rs)
2.7.1	Ordinary rock	Cum	196.00
2.7.2	Hard rock (requiring blasting)	Cum	313.00
2.7.3	Hard rock (blasting prohibited)	Cum	404.00
2.8	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.		
2.8.1	All kinds of soil	Cum	129.00
2.9	Excavation work in foundation trenches or drains not exceeding 1.5 m in width or 10 sqm on plan including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soils as directed, within a lead of 50m.		
2.9.1	Ordinary rock	Cum	202.00
2.9.2	Hard rock (requiring blasting)	Cum	320.00
2.9.3	Hard rock (blasting prohibited)	Cum	400.00
2.10	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :		
2.10.1	All kinds of soil		
2.10.1.1	Pipes, cables etc, not exceeding 80 mm dia.	Meter	89.00
2.10.1.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	Meter	145.00
2.10.1.3	Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm.	Meter	226.00
2.11	Extra for excavating trenches for pipes, cables etc. in all kinds of soil for depth exceeding 1.5 m, but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 meter).	Meter	132%
2.12	Extra for excavating trenches for pipes, cables, etc, in all kinds of soil for depth exceeding 3 m in depth, but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 meter.)	Meter	340%

S.No	Description of Items	Unit	Rate(in Rs)
2.13	Excavating trenches of required width for pipes, cables, etc, including excavation for sockets, depth upto 1.5 m including getting out the excavated materials, returning the soil as required in layers not exceeding 20 cm in depth including consolidating each deposited layers by ramming, watering etc. stacking serviceable material for measurements and disposal of unserviceable material as directed, within a lead of 50m :		
2.13.1	Ordinary rock :		
2.13.1.1	Pipes, cables etc, not exceeding 80 mm dia.	Meter	126.00
2.13.1.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	Meter	311.00
2.13.1.3	Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm.	Meter	358.00
2.13.2	Hard rock (requiring blasting)		
2.13.2.1	Pipes, cables etc, not exceeding 80 mm dia.	Meter	182.00
2.13.2.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	Meter	451.00
2.13.2.3	Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm.	Meter	519.00
2.13.3	Hard rock (blasting prohibited)		
2.13.3.1	Pipes, cables etc, not exceeding 80 mm dia.	Meter	220.00
2.13.3.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	Meter	544.00
2.13.3.3	Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm.	Meter	626.00
2.14	Extra for excavating trenches for pipes, cables, etc. in ordinary/hard rock exceeding 1.5 m in depth but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 meter.), % increase over item no. 2.13.2.2	Meter	99%
2.15	Extra for excavating trenches for pipes, cables, etc. in ordinary/hard rock exceeding 3m in depth but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 meter.) % increase over item no. 2.13.2.2	Meter	244.30%
2.16	Close timbering/steel in trenches including strutting, shoring and packing cavities (wherever required) complete. (Measurements to be taken of the face area timbered).		
2.16.1	Depth not exceeding 1.5m	Sqm	99.00
2.16.2	Depth exceeding 1.5m but not exceeding 3 m.	Sqm	104.00

S.No	Description of Items	Unit	Rate(in Rs)
2.16.3	Depth exceeding 3m but not exceeding 4.5 m.	Sqm	110.00
2.17	Close timbering/steel in case of shafts, wells, cesspits, manholes and the like including strutting, shoring and packing cavities (wherever required) etc. complete. (Measurements to be taken of the face area timbered).		
2.17.1	Depth not exceeding 1.5m	Sqm	102.00
2.17.2	Depth exceeding 1.5m but not exceeding 3 m.	Sqm	108.00
2.17.3	Depth exceeding 3m but not exceeding 4.5 m.	Sqm	112.00
2.18	Close timbering/steel over areas including strutting, shoring and packing, cavities (wherever required) etc. complete. (Measurements to be taken of the face area timbered) :		
2.18.1	Depth not exceeding 1.5m	Sqm	88.00
2.18.2	Depth exceeding 1.5m but not exceeding 3 m.	Sqm	91.00
2.18.3	Depth exceeding 3m but not exceeding 4.5 m.	Sqm	95.00
2.19	Extra for planking,strutting and packing materials for cavities (in close timbering) if required to be left permanently in position.(Face area of timber permanently left to be measured).	Sqm	1328.00
2.20	Open timbering in trenches including strutting and shoring complete(measurements to be taken of the face area timbered):		
2.20.1	Depth not exceeding 1.5m	Sqm	51.00
2.20.2	Depth exceeding 1.5m but not exceeding 3 m.	Sqm	53.00
2.20.3	Depth exceeding 3m but not exceeding 4.5 m.	Sqm	56.00
2.21	Open timbering in case of shafts, wells, cesspits, manholes and the like including strutting and shoring complete (Measurements to be taken of the face area timbered):		
2.21.1	Depth not exceeding 1.5 m.	Sqm	43.00
2.21.2	Depth exceeding 1.5m but not exceeding 3 m.	Sqm	46.00
2.21.3	Depth exceeding 3m but not exceeding 4.5 m.	Sqm	50.00
2.22	Open timbering over areas including strutting, shoring etc. complete. (Measurements to be taken of the face area timbered):		
2.22.1	Depth not exceeding 1.5 m.	Sqm	29.00
2.22.2	Depth exceeding 1.5m but not exceeding 3 m.	Sqm	31.00
2.22.3	Depth exceeding 3m but not exceeding 4.5 m.	Sqm	12.00
2.23	Extra for planking and strutting in open timbering if required to be left permanently in position. (Face area of the timber permanently left to be measured).	Sqm	683.00

S.No	Description of Items	Unit	Rate(in Rs)
2.24	Extra rates for quantities of works, executed: (The extra percentage rate is applicable in respect of each item but limited to quantities of work executed in these difficult conditions).		
2.24.1	In or under water and/or liquid mud, including pumping out water as required.(All water that may accumulate in excavations during the progress of the work from seepage, (not due to the negligence of the contractor), shall be bailed, pumped out or otherwise removed. The contractor shall take adequate measures for bailing and/or pumping out water from excavations and/or pumping out water from excavations and construct diversion channels, bunds, sumps, etc)	Mtr Depth	(20% of the rate of the item. The extra percentage in rate is applicable in respect of each item but limited, to quantities of ,work excuted,in difficult condition.)
2.24.2	In or under foul position, including pumping out water as required.(Excavation, where sewage, sewage gases or foul conditions are met with from any source, shall fall in this category. Decision of the. Engineer-in-Charge whether the work is in foul position or not shall be final.)	Mtr Depth	(25% of the rate of the item. This pertains to only such Pumping of water as is envisaged at the time of tendering and don't include those that covered under contractual risk.)
Note: -	The extra percentage rate is applicable in respect of each item but limited to quantities of work executed in these difficult conditions. The unit, namely, meter depth, to be considered for payment, shall be the depth measured from the sub soil water level up to the centre of gravity of the qty executed in difficult condition. The depth shall be reckoned correct to 0.10m, 0.05m or more shall be taken as 0.10m and less than 0.05m ignored.		
2.25	Filling by available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum	59.00
2.26	Extra for every additional lift of 1.5 m or part thereof in.		
2.26.1	All kinds of soil.	Cum	24.00
2.26.2	Ordinary or hard rock.	Cum	44.00
2.27	Supplying and filling in plinth under floors including, watering, ramming consolidating and dressing complete.		
2.27.1	Crusher Stone Dust	Cum	628.00
2.27.2	Local Sand	Cum	1201.00
2.27.3	Moorum/Hard copra	Cum	570.00
2.28	Surface dressing of the ground including removing vegetation and in-equalities not exceeding 15 cm deep and disposal of rubbish, lead upto 50 m and lift upto 1.5 m.		
2.28.1	All kinds of soil.	100Sqm	663.00

S.No	Description of Items	Unit	Rate(in Rs)
2.29	Ploughing the existing ground to a depth of 15 cm to 25 cm and watering the same.		
2.29.1	All kinds of soil.	100Sqm	661.00
2.30	Excavating holes upto 0.5 cum including getting out the excavated soil, then returning the soil as required in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering etc, disposing of surplus excavated soil; as directed within a lead of 50 m and lift upto 1.5 m.		
2.30.1	All kinds of soil.	Each	75.00
2.30.2	Ordinary or hard rock.	Each	102.00
2.30.3	Hard rock (requiring blasting)	Each	162.00
2.30.4	Hard rock (blasting prohibited)	Each	223.00
2.31	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of1 m above ground level and removal of rubbish upto a distance of 50 meter outside the periphery of the area cleared.	100Sqm	341.00
2.32	Clearing grass and removal of the rubbish upto a distance of 50 moutside the periphery of the area cleared.	100Sqm	176.00
2.33	Felling trees of the girth (measured at a height of 1 m above ground level) including cutting of trunks and branches removing the roots and stacking of serviceable material and disposal of unserviceable material.		
2.33.1	Beyond 30 cm girth upto and including 60 cm girth	Each	104.00
2.33.2	Beyond 60 cm girth upto and including 120 cm girth	Each	466.00
2.33.3	Beyond 1200 cm girth upto and including 240 cm girth	Each	2177.00
2.33.4	above 240 cm girth	Each	4311.00
2.34	Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment (excluding the cost of chemical emulsion .		
2.34.1	Along external wall where the apron is not provided using chemical emulsion @ 7.5 liters / sqm of the vertical surface of the substructure to a depth of 300 mm including excavation channel along the wall & rodding etc. complete.		
2.34.1.1	With Chlorpyriphos/ Lindane E.C. 20% with 1% concentration.	Meter	9.00
2.34.2	Along the external wall below concrete or masonry apron using chemical emulsion @ 2.25 litres per linear meter including drilling and plugging holes etc.		

S.No	Description of Items	Unit	Rate(in Rs)
2.34.2.1	With Chlorpyriphos/ Lindane E.C. 20% with 1% sqm concentration.	Meter	15.00
2.34.3	Treatment of soil under existing floors using chemical emulsion @ one liter per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor :		
2.34.3.1	With Chlorpyriphos/Lindane E.C. 20% with 1% concentration (will be supplyed by departmentally)	Sqm	62.00
2.34.4	Treatment of existing masonry using chemical emulsion @ one litre per hole at 300 mm interval including drilling holes at 45 degree and plugging them with cement mortar 1:2 (1 cement : 2 coarse sand) to the full depth of the hole :		
2.34.4.1	With Chlorpyriphos/Lindane E.C. 20% with 1% concentration.	Meter	10.00
2.34.5.1	Treatment at points of contact of wood work by chemical emulsion Chlorpyriphos/ Lindane (in oil or kerosene based solution) @ 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.	Meter	124.00
2.35	Deduct for disposed soil not levelled and neatly dressed (against Item No. 2.6,&2.7)	Cum	18.00
2.36	Pumping out water caused by springs, tidal or river seepage, broken water mains ordrains and the like.	KL	51.00

3.0 MORTARS

Notes for Specifications :-

1 **Cement: -** Cement to be used in the works shall be any of the following types specified to the prescribed tests and approval of the Engineer-in-charge :

(a) Ordinary portland cement, 33 Grade conforming to IS : 269.

(b) Ordinary portland cement, 43 Grade conforming to IS : 8112.

(c) Ordinary portland cement, 53 Grade conforming to IS : 12269.

(d) Sulphate resistant portland cement conforming to IS : 12330.

(e) Portland Pozzolona Cement conforming to IS : 1489.

2 Sand: Sand to be used in the work, shall conform to IS: 1542-1960 for plaster and IS: 2166-1965 for masonry work.

3 Cement Mortar: Cement and sand shall be mixed in specified proportions given in the agreement/drawings. All mortars shall be mixed with a minimum quantity of water to produce desired workability consistent with maximum density of mortar. The mix shall be clean and free from injurious type of soil/acid/alkali/organic matter or deleterious substances.

4 Water : Water used for mixing and curring shall be clean and free from injurious amount of oils, acids, alkalis, salts, sugar, organic or other substances. Potable water is generally considered satisfactory for preparing mortars.

5 The mixing shall preferably be done in a mechanical mixer operated manually or by power. Hand mixing can be resorted to as long as uniform density of the mix and its strength are assured subject to prior approval of the Engineer-in-Charge. Hand mixing operation, if permitted, shall be carried out on a clean water tight platform where cement and sand shall be first mixed dry in the required proportion by being turned over and over, backwards and forwards several times till the mixture is of uniform colour. Thereafter, minimum quantity of water shall be added to bring the mortar to the consistency of stiff paste. The mortar shall be mixed for at least two minutes after addition of water. Mortar shall be mixed only in such quantity as required for immediate use.

The mix which has developed initial set, shall not be used. Intial set of mortar with O.P.C. shall normally be considered to have taken place in 30 minutes after mixing. If the mortar has stiffened during initial setting time because of evaporation of water, same can be re-tempered by adding water as frequently as needed to restore requisite consistency shall not be permitted after 30 minutes. Mortar, unused for more than 30 minutes, shall be rejected and removed from site.

MANDATORY TESTS FOR WATER, CEMENT & SAND						
	Material	Test	Field/ laboratory test	Test procedure	Min. quantity of material for carrying out the test	Frequency of testing
	Water	(i) pH Value	Lab	IS 3025	-	Water from each source shall be got tested before the commencement of work and thereafter once in every three months till the completion of the work. Water from municipal source need be tested only once in six months. Number of Tests for each source shall be 3
		(ii) Limits of Acidity	Lab			
		(iii) Limits of Alkality	Lab			
		(iv) Percentage of solids				
		(a) Chlorides	Lab			
		(b) Suspended matter	Lab			
		(c) Sulphates	Lab			
		(d) Inorganic solids	Lab			
		(e) Organic solids	Lab			
	Cement	(a) Physical requirement				
		(i) Fineness	Lab	IS 4031 (Part II)	Each lot	Every 50 tonnes or part thereof. Each brand of cement brought to site shall be tested as per this frequency.
		(ii) Soundness	Lab	IS 4031 (Part III)		
		(iii) Setting time (Intital & Final)	Lab	IS 4031 (Part V)		
		(iv) Compressive strength	Lab	IS 4031 (Part VI)		
		(v) Consistency of Standard cement paste	Lab	IS 4031 Part VI)		
	Sand	Organic impurities	Field	As given in specification Chapter of mortars	20 cum	Every 20 cum or part thereof or more frequently as decided by Engineer-in-Charge.
		Silt Content	Field	As given in specification Chapter of mortars	20 cum	- do -

		Particle size distribution a,b,c,d & e	Field or Laboratory as decided by the Engineer-in-Charge	As given in specification Chapter of mortars	40 cum	40 cum or part thereof
	Sand	Bulking of Sand	Field	As given in specification Chapter of mortars	20 cum	Every 20 cum or part thereof or more frequently as decided by Engineer-in-charge.
(For Detail Refer UADD MORTAR specification / CPWD specification)						

3.0 MORTARS			
S.No	**Description of Items**	**Unit**	**Rate (in rate)**
3.1	Cement Mortar 1:1 (1 cement : 1 fine sand)	cum	6601.00
3.2	Cement mortar 1:2 (1 cement : 2 fine sand).	cum	5015.00
3.3	Cement mortar 1:3 (1 cement : 3 fine sand).	cum	4230.00
3.4	Cement mortar 1:4 (1 cement : 4 fine sand).	cum	3520.00
3.5	Cement mortar 1:5 (1 cement : 5 fine sand).	cum	3138.00
3.6	Cement mortar 1:6 (1 cement : 6 fine sand).	cum	2810.00
3.7	Cement mortar 1:2 (1 cement : 2 coarse sand).	cum	4920.00
3.8	Cement mortar 1:3 (1 cement : 3 coarse sand).	cum	4122.00
3.9	Cement mortar 1:4 (1 cement : 4 coarse sand).	cum	3411.00
3.10	Cement mortar 1:5 (1 cement : 5 coarse sand).	cum	3029.00
3.11	Cement mortar 1:6 (1 cement : 6 coarse sand).	cum	2701.00
3.12	Cement mortar 1:2 (1 cement : 2 stone dust).	cum	4440.00
3.13	Cement mortar 1:2 (1 cement : 2 marble dust).	cum	4920.00
3.14	Cement mortar 1:5 (1 cement : 5 marble dust).	cum	3029.00
3.15	White cement mortar 1:2 (1 white cement : 2 marble dust).	cum	10139.00
3.16	White cement mortar 1:3 (1 white cement : 3 marble dust).	cum	8046.00
3.17	White cement mortar 1:5 (1 white cement : 5 marble dust).	cum	5425.00
3.18	Mud mortar	cum	231.00

4.0 CONCRETE WORK CEMENT CONCRETE (CAST - IN - SITU)

Notes for Specifications :-

1 Cement: Cement to be used in the works shall be any of the following types specified to the prescribed tests and approval of the Engineer-in-charge :

(a) Ordinary portland cement, 33 Grade conforming to IS : 269.

(b) Ordinary portland cement, 43 Grade conforming to IS : 8112.

(c) Ordinary portland cement, 53 Grade conforming to IS : 12269.

(d) Sulphate resistant portland cement conforming to IS : 12330.

(e) Portland Pozzolona Cement conforming to IS : 1489.

2 Aggregates: aggregate shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone. They shall not consist pieces of disintegrated stones, soft, flaky, elongated particles, salt, alkali, vegetable matter or other deleterious materils. All aggregate shall conform to IS: 383 and tests for conformity shall be carried out as per IS : 2386 parts I to VIII.

2.1 Size and Grading

(i) Stone aggregate and gravel: it shall be either graded or single size as specified. Nominal size and grading shall be as under:-

(a) Nominal size of graded stone aggregate or gravel shall be 40, 20, 16, or 12.5 mm as specified.For any one of the nominal sizes, The proportion of other sizes as determined by the method prescribed in IS 2386 (Part-I) shall be in accordance with tabel 4.1.

TABLE 4.1
Graded stone Aggregate or Gravel

IS Sieve Designation	% by weight passing the nominal size			
	40mm	20mm	16 mm	12.5mm
80 mm	100	-	-	-
63mm	-	-	-	-
40mm	95-100	100	-	-
20mm	30-70	95-100	100	100
16mm	-	-	90-100	-
12.5mm	-	-	-	90 to 100
10 mm	10-35	25-55	30-70	40 to 85
4.75	0-5	0-10	0-10	0 to 10

(b) Nominal size of single sized stone aggregate or gravel shall be 63, 40, 20, 16, 12.5,or 10 mm as specified. For any one of the nominal sizes,the proportion of other sizes as determined by the method prescribed in IS 2386 (Part-I) shall be in accordance with tabel 4.2.

TABLE 4.2
Single size (ungraded) stone Aggregate or Gravel

IS Sieve Designation	*Percentage passing (by weight) for nominal size of*					
	63mm	*40mm*	*20 mm*	*16mm*	*12.5mm*	*10 mm*
80 mm	100	-	-	-	-	-
63 mm	85-100	100	-	-	-	-
40 mm	0-30	85-100	100	-	-	-
20mm	0-5	0-20	85-100	100	-	-
16 mm	-	-	-	85-100	100	-
12.5mm	-	-	-	-	85-100	100
10mm	0-5	0-5	0-20	0-30	0-45	85-100
4.75 mm	-	-	0-5	0-5	0-10	0-20
2.36 mm	-	-	-	-	-	0-5

(c) Strenght of Aggregate

C.1 Aggregate crushing value: -

The aggregate of crushing value, when determined in accordance with IS:2386 (Part-IV) -1963 shall not exceed 45 percent for aggregate used for concrete other then for wearing surfaces, and 30 percent for concrete for wearing surfaces, such as runways, roads and pavements.

C.2 Aggregate Impact value

As an alternative to 3.3 the aggregate impact value may be determined in accordance with the method specified in IS:2386 (Part-IV) – 1963. The aggregate impact value shall not exceed 45 percent by weight for aggregate used for concrete other then for wearing surface and 30 percent by wearing for concrete for wearing surface, such as runways, roads and pavements.

C.3 Aggregate Abrasion Value

Unless otherwise agreed to between the purchasers and supplied, the abrasion value of aggregates, when tested in accordance with the method specified in IS:2386 (Part-IV)-1963 using Los Angeles machine, shall not exceed the following values

For aggregate to be used in concrete for wearing surfaces	30 Percent
For aggregate to be used in other concrete	50 Percent

3 **Sand/Fine Aggregates :**

Sand to be used for lime or cement concrete should be dry and free from all deleterious materials, and shall conform to IS: 383-2007 & fine aggregates shall not contain dust, lumps, soft or flaky materials, mica or other deleterious materials. Fine aggregates having positive alkali-silica reaction shall not be used. All fine aggregate shall conform to IS : 383. The fineness modulus of fine aggregate shall neither be less than 2.0 nor greater than 3.5.

4 **Water** : Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete. Potable water is generally considered satisfactory for mixing and curing of concrete.

5 **Concrete**: Concrete shall be mixed either in a concrete mixer or in a batching and mixing plant. Hand mixing is prohibited. Mixing shall be continued till materials are uniformly distributed and a uniform colour of the entire mass is obtained and each individual particle of the aggregate shows complete coating of mortar, containing its proportionate amount of cement. In no case, mixing shall be done for less than 2 minutes.

Table 4.3 Grades of Concrete

As per IS 456 : 2000 Table number 2

Group	Grade *Designation*	*Specified characteristic compressive strength of 150 mm Cube at 28 Days in N/mm²*
(1)	(2)	(3)
Ordinary Concrete	M10	10
	M15	15
	M20	20
Standard Concrete	M25	25
	M30	30
	M35	35
	M40	40
	M45	45
	M50	50
	M55	55
High Strength Concrete	M60	60
	M65	65
	M70	70
	M75	75
	M80	80

Notes:-

1 In the designation of concrete mix M refers to the mix and the number to the specified compressive strength of 150 mm size cube at 28 days, expressed in N/mm2.

2 For concrete of compressive strength greater than M55, design parameters given in the standard may not be applicable and the values may be obtained from specialized literatures and experimental results.

Grade of concrete for plain & reinforced concrete:-

The minimum grade of concrete for plain and reinforced concrete shall be as per Table given below.

Table 4.4

Minimum Cement Content, Maximum Water-Cement Ratio & Minimum Grade of Concrete for Different Exposures with Normal Weight Aggregates of 20 mm Nominal;Maximum Size

As per IS 456 : 2000 Table number 5

Sl No	*Exposure*	*Plain Concrete*			*Reinforced Concrete*		
		Minimum Cement Content kg/m³	*Maximum Free Water Cement Ratio*	*Minimum Grade of Concrete*	*Minimum Cement Content kg/m³*	*Maximum Free Water-Cement Ratio*	*Minimum Grade of Concrete*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
(i)	Mild	220	0 60	-	300	0 55	M20
(ii)	Moderate	240	0 60	M15	300	0 50	M25
(iii)	Severe	250	0 50	M20	320	0 45	M30
(iv)	Very Severe	260	0 45	M20	340	0 45	M35
(v)	Extreme	280	0 40	M25	360	0 40	M40

Notes:-

1 Cement content prescribed in this Table is irrespective of the grades of cement. The additions such as fly or ground granulated blast furnace slag may be taken into account in the concrete composition with respect to the cement content and water-cement ratio, if the suitability is established and as long as the maximum amounts taken into account do not exceed the limit of pozzolona and slag specified in IS 1489 (Part 1) and IS 455 respectively

2 Minimum grade for plain concrete under mild exposure condition is not specified.

3 The above minimum cement content and maximum water cement ratio apply only to 20 mm nominal maximum size aggregate. For other sizes of aggregate, these should be changed as per Table 6 of IS 456.

5.1 **Concrete Mix: -**

The mix proportion shall be selected to ensure the workability of the fresh concrete and when concrete is hardened, it shall have the required strength, durability and surface finish.

The determination of the proportions of cement, aggregates and water to attain the required strength shall be made as follows: -

(a) By designing the concrete mix; such concrete shall be called 'Design mix concrete' , or

(b) By adopting nominal concrete mix; such concrete shall be called 'Nominal mix concrete'.

Design mix concrete is preferred to nominal mix. If design mix concrete can not be used for reason on the work for graded of M-20 or lower, nominal mixes may be used with the permission of engineer in charge, which, however, is likely to involve a higher cement content.

5.2 **Nominal Mix: -**

Nominal mix concrete may be used for concrete for M-20 or lower. The proportion of materials for nominal mix concrete shall be in accordance with table given below :-

Table 4.5 Proportions for Nominal Mix Concrete

As per IS 456 : 2000 Table number 9

Grade of Concrete	*Total Quantity of Dry Aggregates by Mass per 50 kg of cement, to be taken as the Sum of the individual Masses of Fine and Coarse Aggregates, Kg. Max*	*Proportion of Fine Aggregate to Coarse Aggregate (by Mass)*	*Quantity of Water per 50 kg of Cement, max Ltr*
(1)	*(2)*	(3)	*(4)*
M5	800	Generally 1:2 but subject to an upper limit of 1:1½ and a lower limit of 1:2 V2	60
M7.5	625		45
M10	480		34
M15	330		32
M20	250		30

Notes:-

1 The proportion of the fine to coarse aggregate should be adjusted from upper limit progressively as the grading of fine aggregate becomes finer and the maximum size of coarse aggregate becomes larger. Graded coarse aggregate shall be used.

2 Quantity of water required from durability point of view may be less than the value given above.

Concrete shall be transported and placed as near as practicable to its final position. Concrete shall not be freely dropped into place from a height exceeding 1.50meters and it shall be compacted in its final position within 30 minutes of its discharge from the mixer. It shall be compacted thoroughly by vibration or other means during placing so as to produce a dense homogeneous void-free mass having the required surface finish. Bottom and side surfaces shall give a uniform texture, smooth surface and good appearance. Non uniform texture and rough surface of concrete shall be treated as defective work and it has to be remedied with 1:3 cement plaster but in no case, more than 5% of area be permitted to be made good with plastering, Concrete having rough, non uniform texture and honey combing in more than 5% area shall be rejected and the payment for the formwork shall also be not made.

6 Formwork shall include all temporary or permanent forms required for forming the concrete of the shape, dimensions and surface finish as shown on the drawings together with all props, staging, centering, scaffolding and temporary construction required for their support.

7 All materials shall conform to the specifications issued by the Indian Standards Institution. Materials and components used for formwork shall be examined for damage or excessive deterioration before use/reuse and shall be used only if found suitable after necessary repairs. In case of timber form work, the inspection shall not only cover physical damages but also signs of attacks by decay, rot or insect attack or the development of splits.

8 Form shall be constructed with metal or timber. The metal used for forms shall be of such thickness that the forms remain true to shape. All bolts should be counter sunk.

9 The contractor shall furnish the design and drawing of complete formwork (i.e. the forms as well as their supports) for approval of the Engineer-in-Charge before any erection is taken up. Not withstanding any approval or review of drawing and design by the Engineer-in-Charge, the contractor shall be entirely responsible for the adequacy and safety of form work.

10 The formwork shall be robust and strong and joints shall be leakproof. Staging must have cross bracings and diagonal bracings in both direction and the number of joints in the form work shall be kept to a minimum by using large size panels.

11 Rates in this chapter are for the finished work including the cost of all materials, labour, tools and plant required for design, construction and removal of formwork including properly supporting the members until the concrete is cured, set and hardened as required and also inclusive of lining with material approved by the Engineer-in-Charge so as to provide a smooth finish of uniform texture, appearance and to produce a finished concrete true to shape, line, levels and dimension as shown on the drawings. The material used shall leave no stain on the concrete and so fixed to its backing as not to impart any blemishes. The rate also includes coating of formwork with an approved release agent that will effectively prevent sticking and will not stain the concrete surface. Lubricating (machine oils) are prohibited for use as a coating.

12 The rate includes provision of gradient in formwork for terrace roof as per direction of Engineer-in-Charge and the gradient shall be provided necessarily so that water is drained out quickly and effectively.

13 Rates also include all leads and lifts of all materials etc. required for the work.

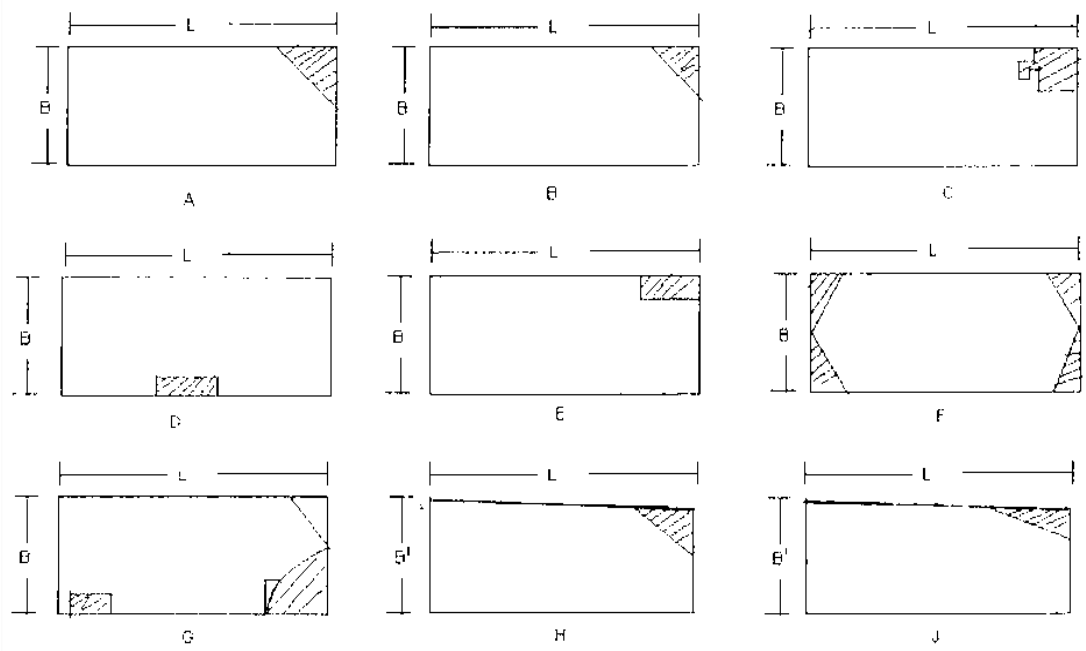
14 Measurements :

14.1 Dimensions of length, breadth and thickness shall be measured correct to nearest cm. Except for the thickness of slab and partition which shall be measured to nearest 5 mm. Areas shall be worked out to nearest 0.01 sq.m and the cubic contents of consolidated concrete shall be worked out to nearest 0.01 cum. Any work done in excess over the specified dimension or sections shown in the drawing shall be ignored.

14.2 Concrete work executed in the following conditions shall be measured separately:
(a) Work in or under water
(b) Work in liquid mud
(c) Work in or under foul positions

14.3 Cast-in-situ concrete and or precast concrete work shall be measured in stages described in the item of work, such as:
(a) At or near the ground level
(b) Upto specified floor level
(c) Between two specified floor levels
(d) Upto specified height above or depth below plinth level/ defined datum level.
(e) Between two specified heights or depths with reference to plinth/defined datum level.

14.4 No deduction shall be made for the following:
(a) Ends of dissimilar materials for example beams, posts, girders, rafters, purlins, trusses, corbels and steps upto 500 sq cm in cross sections.
(b) Opening upto 0.1 sq meter (1000 sq.cm)
(c) Volume occupied by pipes, conduits, sheathing etc. not exceeding 100 sq cm each in cross sectional areas.
(d) Small voids such as shaded portions in Figure A to J below when these do not exceed 40 sq cm each in cross section.



MANDATORY TESTS FOR STONE AGGREGATE & CONCRETE

Material	Test	Field/ Laboratory	Test procedure	Min. qty of Material for Carrying out test	Frequency of Testing
1	*2*	*3*	*4*	*5*	*6*
Stone aggregate	(a) Percentage of soft or deleterious material	Field or Laboratory-Test as required	IS 2386-Part II	As required by Engineer-in-charge	For all quantities
	Particle size	Field/ Lab	As given in Specification Chapter of Concrete	45 cum	For every 45 cum or part thereof for RCC Work only. For rest of items as decided by Engineer-in-charge
	(a) Estimation of organic impurities	Field/ Lab	IS 2306-Part2	10 cum	For every 40 cum or part thereof
	(b) Surface moisture	Field/ Lab	IS 2386	10 cum	-do-
	(c) Determination of 10% fine value	Field/ Lab	IS 2386	10 cum	-do-
	(d) Specific gravity	Field/ Lab	IS 2386	10 cum	-do-
	(e) Bulk density	Field/ Lab	IS 2386	10 cum	-do-
	(f) Aggregate crusing strength	Field/ Lab	IS 2386	10 cum	-do-
	(g) Aggregate impact value	Field/ Lab	IS 2386	10 cum	-do-
Concrete	Slump test	Field	As given in Specification Chapter of Concrete	10 cum	15 cum or part thereof

15 Special Structures

For structures like retaining walls, wing walls, chimneys, over head reservoirs/tanks and other elevated structures, where elevations heights above a defined datum level have not been specified and identification of floors cannot be done as in case of building. Level, at 1.2m above the ground level shall be the floor 1 level as well as plinth level. Level at a height of 3.5m above floor 1 level will be reckoned as floor 2 level and level at a height of 3.5m above the floor 2 level will be floor 3 level and so on, where the total height above floor 1 level is not a whole number multiple of 3.5m meter. Top most floor level shall be the next in sequence to the floor level below even if the difference in height between the two upper most floor levels is less than 3.5 meters.

16 FOUNDATION AND PLINTH

work in foundation and plinth shall include:

(a) For buildings: All works upto 1.2 meter above ground level or upto floor 1 level whichever is lower:

(b) For abutments, piers and well steining: all works upto 1.2m above the bed level:

(c) For retaining wall, wing walls, compound walls, chimneys, over head reservoirs/tanks and other elevated structures: All works upto 1.2 meter above the ground level:

(d) For reservoirs/tanks (other than overhead reservoirs/tanks): All works upto 1.2 meter above the ground level:

(e) For basements: All works upto 1.2m above ground level or upto floor 1 level whichever is lower.

Note: Specific provisions shall be made in the estimate for such situations where the foundation level is more than 3 (three) meter depth from the plinth for all types of structures mentioned above.

(For Detail Refer UADD CONCRETE WORK specification / CPWD specification)

4.0 CONCRETE WORK CEMENT CONCRETE (CAST - IN - SITU)			
S.No	**Description of Items**	**Unit**	**Rate**
4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering All work up to plinth level.		
4.1.1	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	4594.00
4.1.2	Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	4154.00
4.1.3	Cement concrete grade M-15 (Nominal Mix) with 40 mm maximum size of stone aggregate	Cum	4094.00
4.1.4	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	3595.00
4.1.5	Cement concrete grade M-10 (Nominal Mix) with 40 mm maximum size of stone aggregate	Cum	3528.00
4.1.6	Cement concrete grade M-7.5 (Nominal Mix) with 40 mm maximum size of stone aggregate	Cum	3212.00
4.1.7	Cement concrete grade M-5 (Nominal Mix) with 40 mm maximum size of stone aggregate	Cum	2971.00
4.1.8	Labour rate for Item No.- 4.1.1 to 4.1.7	Cum	572.00
4.1.9	1:2:3½:9 (1 ordinary portland cement : 2 Fly ash : 3½ coarse sand : 9 graded stone aggregate 40 mm nominal size)	Cum	3159.00
4.1.10	1:2½:4:11 (1 ordinary portland cement : 2½ fly ash : 4 coarse sand : 11 graded stone aggregate 40 mm nominal)	Cum	2868.00
4.2	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. up to floor two level, excluding the cost of centering, shuttering and finishing :		
4.2.1	Concrete grade M-20 (nominal mix) with 20 mm maximum size of stone aggregate	Cum	4751.00
4.2.2	Concrete grade M-15 (nominal mix) with 20 mm maximum size of stone aggregate	Cum	4311.00
4.2.3	Concrete grade M-15 (nominal mix) with 40 mm maximum size of stone aggregate	Cum	4251.00
4.2.4	Concrete grade M-10 (nominal mix) with 20 mm maximum size of stone aggregate	Cum	3752.00
4.2.5	Concrete grade M-10 (nominal mix) with 40 mm maximum size of stone aggregate	Cum	3686.00
4.2.6	Labour rate for Item No.- 4.2.1 to 4.2.5	Cum	652.00

S.No	Description of Items	Unit	Rate
4.3	Providing and laying cement concrete in kerbs, steps and the like at or near ground level excluding the cost of centering, shuttering and finishing.		
4.3.1	Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	4154.00
4.3.2	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	3595.00
4.3.3	Labour rate for Item No.- 4.3.1 to 4.3.2	Cum	495.00
4.4	Providing and fixing up to floor Two level precast cement concrete string or lacing courses, copings, bed plates, anchor blocks, plain window sills, shelves, louvers, steps, stair cases, etc. including hoisting and setting in position with cement mortar 1:3 (1 Cement : 3 coarse sand), cost of required centering, shuttering and finishing smooth with 6mm thick cement plaster 1:3 (1 Cement : 3 fine sand) on exposed surfaces complete.		
4.4.1	Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	5998.00
4.4.2	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	5424.00
4.4.3	Labour rate for Item No.- 4.4.1 to 4.4.2	Cum	701.00
4.4.4	Add extra in item no. 4.4.1 if CC M-20 is used.	Cum	440.00
4.5	Providing and fixing at or near ground level precast cement concrete in kerbs, edgings etc. as per approved pattern and setting in position with cement mortar 1:3 (1 Cement : 3 coarse sand) including the cost of required centering, shuttering and finishing smooth with 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete.		
4.5.1	Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	5336.00
4.6	Providing and fixing up to floor Two level precast cement concrete solid block including hoisting and setting in position with cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering, shuttering and finishing smooth with 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete :		
4.6.1	Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	7179.00
4.6.2	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	6604.00

S.No	Description of Items	Unit	Rate
4.7	Providing and fixing up to floor Two level precast cement concrete hollow block including hoisting and setting in position with cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering, shuttering and finishing smooth with 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete :		
4.7.1	Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	6388.00
4.7.2	Cement concrete grade M-10 (Nominal Mix) with 20 mm maximum size of stone aggregate	Cum	6131.00
4.8	Precasting and placing in position 125 mm dia Bollards 600 mm high of required shape including providing M.S. Pipe Sleeve 50 mm dia 300 mm long in the Bollard and M.S. Pipes 40 mm dia and 450 mm long with 150x150x6mm M.S. plate welded at bottom and embedded 150mm in cement concrete grade M-10 (Nominal Mix with 20 mm maximum size of stone aggregate) including necessary excavation of size 250x 250x 450mm deep for the same in bitumen/ concrete pavement at specified spacing.	Each	416.00
4.9	Providing and laying damp-proof course 40mm thick with cement concrete M-15 (Nominal Mix) with 10/12 mm maximum size of stone aggregate.	Sqm	193.00
4.9.1	Labour rate for Item No.- 4.9	Sqm	17.00
4.10	Providing and laying damp-proof course 50mm thick with cement Cement concrete grade M-15 (Nominal Mix) with 20 mm maximum size of stone aggregate	Sqm	226.00
4.10.1	Labour rate for Item No.- 4.10	Sqm	17.00
4.11	Extra for providing and mixing water proofing material in cement concrete work @ 1 kg per 50kg of cement.	Per 50 kg cement	61.00
4.12	Applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality using 1.7kg per square meter on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	Sqm	102.00
4.13	Extra for concrete work in superstructure above floor Two level for each floors or part thereof.	Each	254.00
4.14	Extra for laying concrete in or under water and/or liquid mud including cost of pumping or bailing out water and removing slush etc. complete.	Cum per meter depth	230.00

S.No	Description of Items	Unit	Rate
4.15	Extra for laying concrete in or under foul positions.(Note for item No. 4.15 :- The quantity will be calculated by multiplying the depth measured from the sub-soil water level up to centre of gravity of concrete under sub-soil water level with quantity of concrete in cum executed under sub-soil water. The depth of centre of gravity shall be reckoned correct to 0.1m, 0.05m or more shall be taken as 0.1m and less than 0.05m ignored.)	Cum	90.00
4.16	Making plinth protection 50mm thick of Cement concrete grade M-10 (Nominal Mix with 20 mm maximum size of stone aggregate) over 75mm bed by dry brick ballast 40mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth.	Sqm	419.00
4.17	Plum Cement concrete 1:2:4 with 75% graded metal of maxium size 40 mm and 25% plum of 150mm size.	Cum	3509.00

5.0 REINFORCED CEMENT CONCRETE

Notes for Specification :-

1 General

IS 456- 2000 Code of Practice for Plain and Reinforced Concrete (as amended up to date) shall be followed in regard to Concrete Mix Proportion and its production as under

(a) The concrete mix design shall be done as "Design Mix Concrete" as prescribed in clause-9 of IS 456 mentioned above

(b) Concrete shall be manufactured in accordance with clause 10 of above mentioned IS 456 covering quality assurance measures both technical and organizational, which shall also necessarily require a qualified Concrete Technologist to be available during manufacture of concrete for certification of quality of concrete.

2 **Use of Fly Ash Blended Cements in Cement Concrete (PPCC) in RCC Structures**

(a) Subject to General Guidelines detailed out as above, PPC manufactured conforming to IS 1489 (Part-I) shall be treated at par with OPC for manufacture of Design Mix concrete for structural use in RCC

(b) Till the time, BIS makes it mandatory to print the %age of fly ash on each bag of cement, the certificate from the PPC manufacture indicating the same shall be insisted upon before allowing use of such cements in works

(c) While using PPC for structural concrete work, no further admixing of fly ash shall be permitted.

3 **Steel for Reinforcement**

The steel used for reinforcement shall be any of the following types

(a) Mild steel and medium tensile bars conforming to IS 432 (Part 1)

(b) High strength deformed steel bars conforming to IS 1786

(c) Hard drawn steel wire fabric conforming to IS 1566

(d) Structural steel conforming to Grade A of IS 2062

(e) Thermo-mechanically treated (TMT) Bars

3.1 Mild steel is not recommended for the use in structures located in earthquake zone subjected to severe damage and for structures subjected to dynamic loading (other than wind loading) such as rallway and highway bridges.

3.2 Welding of reinforcement bars covered in this specification shall be done in accordance with the requirements of IS 2751.

4 **Cover:-** The minimum nominal cover to meet durability requirements shall be as under:-

Exposure	**Nominal Concrete cover in mm not less than**
Mild	20
Moderate	30
Severe	45

Notes: -

(i) For main reinforcement upto 12 mm diameter bar for mild exposure the nominal cover may be reduced by 5 mm

(ii) Unless specified otherwise, actual concrete cover should not deviate from the required nominal cover by + 10 mm

(iii) For exposure condition 'severe' and 'very severe' reduction of 5 mm may be made, where concrete grade is M35 and above

5 **Lap Splices :- lap splices shall be as per clause 26.2.5.1 of IS 456:2000**

The following general rules should be followed for lap splicing :

(a) lap splices should not be used for bars larger than 36mm. Larger diameter bars may be welded together. However, if welding is not practicable, lapping may be permitted and additional spirals should be provided around the lapped bars.

(b) Lap length including anchorage value of hooks :

- in flexural tension is L_d or 30 Φ whichever is greater.
- in direct tensions is 2 L_d or 30 Φ whichever is greater.

The straight length of the lap should not be less than 200 mm or 15 Φ

Where L_d = development length

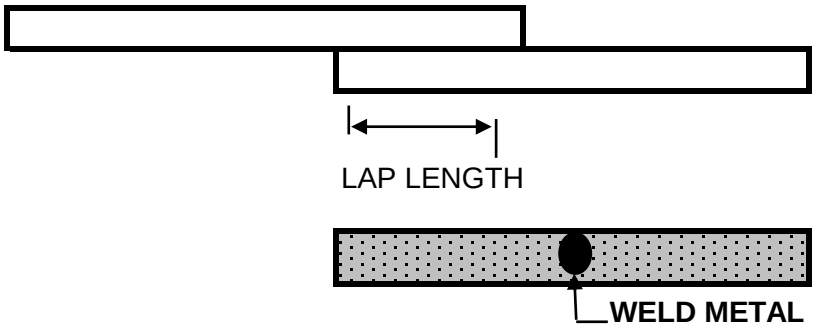
Φ bar diameter

(c) lap splices are considered as staggered if the centre to centre distance of the splices is not less than 1.3 times the lap length.

(d) the lap length in compression is equal to the development length in compression but not less than 24 bar dia meter.

(e) the lap length is calculated on the basis of diameter of smaller bar when bars of two different diameters are to be spliced, and

Note (i) Reinforcement shall be bent and fixed in accordance with procedure specified in IS 2502.
(ii) Bar bending schedules shall be prepared for all reinforcement work.



6 **Joints: -**

(i) **Construction joints**

Concreting shall be carried out continuously upto the construction joints, the position and details of which shall be as shown in approved structural drawing as directed by Engineer in-Charge. Number of such joints shall be kept to minimum. The joints shall be kept at places where the shear force is the minimum. These shall be straight and shall be at right angles to the direction of main reinforcement. Construction Joints should comply with IS 11817.

(ii) **Expansion Joints**

Expansion joints shall be provided as shown in the approved structural drawings as directed by Engineer-in-Charge, for the purpose of general guidance. However it is recommended that structures exceeding 45 m in length shall be divided by one or more expansion joints. The filling of these Joints with bitumen filler, bitumen felt or any such material and provision of copper plate, etc. shall be paid for separately in running meter. The measurement shall be taken two places of decimal stating the depth and width of joint

7 **Measurement of reinforcement**

Reinforcement including authorized spacer bars and lap pages shall be measured in length of different diameter, as actually as per approved drawing used in the work nearest to a centimeter and their weight calculated on the basis of standard weight. In case actual unit weight of the bars is less than standard unit weight, but within variation, in such cases weight of reinforcement shall be calculated on the basis of actual unit weight. Wastage and unauthorized overlaps shall not be paid for. Annealed steel wire required for binding or tack welding shall not be measured, its cost being included in the rate of reinforcement.

8 **Placing of Concrete**

(a) Concreting shall be commenced only after Engineer-in-Charge has inspected the centering, shuttering and reinforcement as placed and passed the same. Shuttering shall be clean and free from all shavings, saw dust, pieces of wood etc

(b) In case of concreting of slab and beams, wooden plank or cat walks of chequerred MS plated or bamboo chalies or any other suitable material supported directly on the centering by means of wooden blocks or lugs shall be provided to convey the concrete to the place of deposition without disturbing the reinforcement in any way. Labour shall not be allowed to walk over the reinforcement.

(c) In case of columns and wall, it is desirable to place concrete without construction joints. The progress of concreting in the vertical direction, shall be restricted to one meter per hour.

(d) The concrete shall be deposited in its final position in a manner to preclude segregation of ingredients. In deep trenches and footings concrete shall be placed through chutes or as directed by the Engineer-in-Charge. In case of columns and walls, the shuttering shall be so adjusted that the vertical drop of concrete is not more than 1.5 meters at a time.

9 Curing :-

After the concrete has begun to harden i.e. about 1 to 2 hours after its laying, it shall be protected from quick drying by convering with moist gunny bags, sand, canvass Hessian or any other material approved by the Engineer-in-Charge. After 24 hours of laying of concrete, the surface shall be cured by ponding with water for a minimum period of 7 days from the date of placing of concrete in case of OPC and at least 10 days where mineral admistures or blended cements are used. The period of curing shall not be less than 10 days for concrete exposed to dry and hot weather condition. It is recommended that above minimum periods may be extended to 14 days in the case of concrete where mineral admixtures or blended cements are used.

10 Removal of Form work (stripping Time) : In normal circumstance and where various types of cements are used, forms, may generally be removed after the expiry of the following periods:

Type of Form work	Minimum period Before Striking Form work for OPC 33 grade	Minimum period Before Striking Form work for OPC 43 grade
(a) Vertical form work to columns, walls, beams	16-24 h	16-24h
(b) Soffit form work to slabs (Props to be refixed immediately after removal of formwork)	3 days	3 days
(c) Soffit form work to beams (Props to be refixed immediately after removal of formwork	7 days	7 days
(d) Props to Slabs		
(1) Spanning upto 4.5m	7 days	7 days
(2) Spanning over 4.5m	14 days	14 days
(e) Props to beams and arches:		
(1) Spanning upto 6m	14 days	14 days
(2) Spanning over 6m	21 days	21 days

11 **Measurement of R.C.C**

11.1 Dimensions shall be measured nearest to a cm except for the thickness of slab which shall be measured correct to 0.5 cm. The areas shall be worked out nearest to 0.01 Sqm. The cubical contents shall be worked out to nearest 0.01 cubic meter.

11.2 Reinforced cement concrete whether cast-in-situ or pre cast shall be classified and measured separately as follows.

(a) Raft, footing, bases of columns and mass concrete etc. all work up to plinth level/column up to plinth level, plinth beams.
(b) Wall (any thickness) including attached pilasters, buttresses plinth and string course, fillets, column, pillars, piers, abutments, post and struts etc.
(c) Suspended floors, roofs, landings and balconies.
(d) Shelves
(e) Chajjas
(f) Lintel, beams and bressummers.
(g) Columns, pillars, piers, abutments, posts and struts.
(h) Stair-cases including waist or waist less slab but excluding landing except in (i) below.
(i) Spiral stair-case (including landing).
(j) Arches, arch ribs, domes and vaults.
(k) Chimneys and shafts.
(l) Well staining.
(m) Vertical and horizontal fins individually or forming box, louvers and facias.
(n) Kerbs, steps and the like.
(o) String courses, bands, coping, bed plates, anchor blocks, plain window sills and the like.
(p) Mouldings as in cornices, window silts etc.
(q) Shell, dome and folded plates.
(r) Extra for shuttering in circular work in plan.

11.3 Work under the following categories shall be measured separately.

(a) Rafts, footings, bases of columns etc. and mass concrete.
(b) All other items upto floor two level.
(c) From floor two level to floor three level and so on.
(d) R.C.C. above roof level shall be measured along with R.C.C. Work in floor just below.

11.4 No deduction shall be made for the following:

(a) Ends of dis-similar materials (e.g. Joists, beams, post, griders, rafter, purlins, trusses, corbels steps etc.) upto 500 sq cm in cross-section.

(b) Opening upto 0.1. sqm.

Note: In calculating area of openings upto 0.1 sqm the size of opening shall include the thickness of any separate lintels or sills. No extra labour for forming such openings or voids shall be paid for.

(c) The volume occupied by reinforcement.

(d) The volume occupied by water pipes, conduits etc. not exceeding 25 sq cm each in cross sectional area. Nothing extra shall be paid for leaving and finishing such cavities and holes.

11.5 Measurement shall be taken before any rendering is done in concrete members. Measurement will not include rendering. The measurement of R.C.C. work between various units shall be regulated as below:

(a) Slabs shall be taken as running continuously through except when slab is monolithic with the beam. In that case it will be from the face to face of the beam.

(b) Beams shall be measured from face to face of columns and shall be including haunches, if any, between columns and beam. The depth of the beam shall be from the bottom of slab to the bottom of beam if beam and slab are not monolithic. In case of monolithic construction where slabs are integrally connected with beam, the depth of beam shall be from the top of the slab to the bottom of beam.

(c) The columns measurements shall be taken through.

(d) Chajjas along with its bearing on wall shall be measured in cubic meter nearest to two places of decimal. When chajjas is combined with lintel, slab or beam, the projecting portion shall be measured as chajjas, built in bearing shall be measured as per item of lintel, slab or beam in which chajja bears.

12 **Rates:**

The rate for reinforcement shall include the cost of labour and materials required for all operations described above such as cleaning of reinforcement bars, straightening, cutting, hooking bending, binding, placing in position etc. as required or directed including tack welding on crossing of bars in lieu of binding with wires.

MANDATORY TESTS FOR R.C.C.						
Material	***Content of R.C.C.***	***Test***	***Field/ laboratory test***	***Test procedure***	***Min, quantity of material for carrying out the test***	***Frequency of testing***
1	***2***	***3***	***4***	***5***	***6***	***7***
Reinforced cement concrete (Nominal Mix)	Concrete	(a) Slump test	Field/Lab	As given in specification chapter of Concrete	(i) 5 cum in case of column	(i) Every 5 cum of part thereof
					(ii) 20 cum for slabs, beams and connected columns	(ii) Every 20 cum or part thereof
					(iii) 20 cum for other R.C.C. work for all other small items and where R.C.C. done in a day is less than 5 cum test may be carried out as required by Engineer-in-Charge.	(iii) -Do-
	Concrete	(b) Cube Test	Lab	As given in specification chapter of R.C.C.	(i) 5 cum in case of column	(i) Every 5 cum or part thereof
					(ii) 20 cum for slabs, beams and connected columns	(ii) Every 20cum or part thereof
					(iii) 20 cum for other R.C.C. work for all other small items and where R.C.C. done in a day is less than 5 cum test may be carried out as required by Engineer-in-Charge.	(iii) -Do-
Reinforced cement Concrete (Design Mix)	Coarse Aggregates				50 cum, or part thereof & also on each change of source	
	Fine Aggregates				50 cum, or part thereof & also on each change of source	

	Cement				50 MT or on each change of source	
	Fresh Concrete	(a) Slump test	Field	As given in specification chapter of Concrete	10 cum	5Qcum for R.C.C. work including in all other small location. R.C.D. done in a day is less than 50 cum test may be carried out as required by Engineer-in-Charge.
	Fresh Concrete	(b) Cube Test	Lab	As given in specification chapter of R.C.C	10 cum or part thereof	50 cum or 10 batches of 5-7 cum each for R.C.C. work in all location taken together. R.C.C. done in a day is less than 50 cum test may be carried out as required by Engineer-in-Charge.
Reinforced Cement Concrete (Ready Mix)	Coarse Aggregates				50 cum or part thereof & also on each change of source	
	Fine Aggregates				50 cum or part thereof & also on each change of source	
	Cement				50 cum or part thereof & also on each change of source	
	Fresh Concrete	(a) Slump test	Field/Lab	As given in Specification of Chapter Concrete	10 cum	50 cum for R.C-C. work including in all other small location. R.C.C. done in a day is less than 50 cum test may be carried out as required by Engineer-in-Charge.

	Fresh Concrete	(b) Cube Test	Lab	As given in Specification of Chapter R.C.C.	10 cum or part thereof	50 cum or 10 batches of 5-7 cum each for R.C.C. work in all location - taken together, R.C.C. done in a day is less than 50 cum test may be carried out as required by Engineer-in-Charge.
Steel for Reinforced cement concrete		(A) Physical Test and chemical tests				(a) For consignment below 100 tonnes
						(i)under 10mm dia, one sample for each 25 tonnes or part there of
						(ii)10mm to 16 mm dia one sample for each 35 tonnes
						(iii) over16 mm dia one sample for each 45 tonnes or part thereof
(For Detail Refer UADD REINFORCED CEMENT CONCRETE specification / CPWD specification)						

5.0 REINFORCED CEMENT CONCRETE			
S.No	**Description of Items**	**Unit**	**Rate (in Rs)**
5.1	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level :		
5.1.1	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate.	Cum	4728.00
5.1.2	Labour rate for Item No.- 5.1.1 including the charges of mixer and vibrator.	Cum	794.00
5.2	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. up to floor two level excluding cost of centering, shuttering, finishing and reinfor cement		
5.2.1	Cement concrete grade M-20 (Nominal Mix) with 20 mm maximum size of stone aggregate.	Cum	5050.00
5.2.2	Labour rate for Item No.- 5.2.1 including the charges of mixer and vibrator excluding the cost of scaffolding.	Cum	865.00
5.3	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases up to floor two level excluding the cost of centering, shuttering, finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate).	Cum	5120.00
5.3.1	Labour rate for Item No.- 5.3 including the charges of mixer and vibrator.	Cum	1110.00
5.4	Providing and laying up to floor two level reinforced cement concrete in kerbs, steps and the like excluding the cost of centering, shuttering, finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	4863.00
5.4.1	Labour rate for Item No.- 5.4 including the charges of mixer and vibrator.	Cum	896.00
5.5	Reinforced cement concrete work in arches, archribs, domes, vaults, shells, folded plate and roofs having slope more than 15° up to floor two level excluding the cost of centering, shuttering, finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	5081.00
5.5.1	Labour rate for Item No.- 5.5 including the charges of mixer and vibrator.	Cum	847.00

S.No	Description of Items	Unit	Rate (in Rs)
5.6	Reinforced cement concrete work in chimneys, shafts, up to floor two level excluding the cost of centering, shuttering, finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	5103.00
5.6.1	Labour rate for Item No.- 5.6	Cum	53.00
5.7	Reinforced cement concrete work in well-steining excluding the cost of centering, shuttering,finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	4797.00
5.7.1	Labour rate for Item No.- 5.7	Cum	203.00
5.8	Reinforced cement concrete work in vertical and horizontal fins individually or forming box louvers, facias and eaves boards up to floor two level excluding the cost of centering, shuttering, finishing and reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	4903.00
5.8.1	Labour rate for Item No.- 5.8	Cum	1072.00
5.9	RBC in cement mortar 1:3 excluding the cost of reinforcement, with Cement concrete M-15 (Nominal Mix with 20 mm maximum size of stone aggregate) on top up to 1/3 effective depthof RBC (slab) etc.	Cum	5734.00
5.9.1	Labour rate for Item No.- 5.9	Cum	964.00
5.10	Providing, hoisting and fixing up to floor two level precast reinforced cement concrete work in string courses, bands, copings, bed plates, anchor blocks, plain window sills and the like including the cost of required centering, shuttering, finishing smooth with 6 mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete but excluding cost of reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	6524.00
5.10.1	Labour rate for Item No. 5.10	Cum	607.00
5.11	Providing, hoisting and fixing up to floor two level precast reinforced cement concrete in small lintels not exceeding 1.5m clear span up to floor two level including the cost of required centering, shuttering and finishing smooth with 6 mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces but excluding the cost of reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate).	cum	7748.00
5.11.1	Labour rate for Item No. 5.11	Cum	797.00

S.No	Description of Items	Unit	Rate (in Rs)
5.20.1	Providing, hoisting and fixing up to floor two level precast reinforced cement concrete in mouldings as in cornices, windows sills etc. including setting in cement mortar 1:3 (1 cement : 3 coarse sand) cost of required centering, shuttering and finishing smooth with 6 mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete but excluding the cost of reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	8617.00
5.12.1	Labour rate for Item No. 5.12	Cum	650.00
5.13	Providing, hoisting and fixing up to floor two level precast reinforced cement concrete in lintels, beams and bressumers including setting in cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering and shuttering and finishing smooth with 6 mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces but excluding the cost of reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	6675.00
5.13.1	Labour rate for Item No. 5.13	Cum	681.00
5.14	Providing, hoisting and fixing up to floor two level precast reinforced cement concrete in shelves including setting in cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering, shuttering and finishing with neat cement punning on exposed surfaces but excluding the cost of reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate)	Cum	8671.00
5.14.1	Labour rate for Item No. 5.14	Cum	660.00
5.15	Providing, hoisting and fixing up to floor two level precast reinforced cement concrete in vertical & horizontal fins individually or forming box louvers setting in cement mortar 1:2 (1 cement : 2 coarse sand) including the cost of required centering, shuttering and finishing smooth with 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) on exposed surfaces complete but excluding the cost of reinforcement with Cement concrete grade M-20 (Nominal Mix with 20 mm maximum size of stone aggregate).	Cum	9166.00
5.15.1	Labour rate for Item No. 5.15	Cum	325.00
5.16	Providing precast cement concrete Jali of cement concrete grade M-15 (Nominal Mix with 20 mm maximum size of stone aggregate) reinforced with 1.6 mm dia mild steel wire including centering and shuttering, roughening cleaning, fixing and finishing in cement mortar 1:3 (1 cement: 3 fine sand) etc. complete excluding plastering of the jambs, sills and soffits.		
5.16.1	50 mm thick	Sqm	481.00
5.16.2	40 mm thick	Sqm	442.00
5.16.3	25 mm thick	Sqm	381.00

S.No	Description of Items	Unit	Rate (in Rs)
5.16.4.1	Labour rate for Item No. 5.16.1 to 5.16.3(1.50 sqm)	Sqm	231.00
5.16.4.2	Labour rate for Item No. 5.16.1 to 5.16.3(0.75 sqm)	Sqm	204.00
5.16.4.3	Labour rate for Item No. 5.16.1 to 5.16.3(0.375 sqm)	Sqm	204.00
5.17	Encasing rolled steel sections, in beams and columns, with cement concrete grade M-15 (Nominal Mix with 20 mm maximum size of stone aggregate) including centering and shuttering complete but excluding cost of reinforcement.	Cum	6690.00
5.17.1	Labour rate for Item No. 5.17	Cum	628.00
5.18	Encasing rolled steel section in grillages with cement concrete grade M-15 (Nominal Mix with 20 mm maximum size of stone aggregate) including centering and shuttering but excluding cost of expanded metal and hangers.	Cum	4392.00
5.18.1	Labour rate for Item No. 5.18	Cum	747.00
5.19	Extra for providing and fixing expanded metal mesh of size 20x60mm and strands 3.25mm wide 1.6mm thick weighing 3.64 kg. per sqm. for encasing of rolled steel sections in beams columns and grillages excluding cost of hangers.	Sqm	347.00
5.20	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding including cost of binding wire upto floor two level including all wastage etc. complete.		
5.20.1	Mild steel and Medium Tensile steel bars.	kilogram	60.00
5.20.2	Hard drawn steel wire	kilogram	56.00
5.20.3	Cold twisted bars	kilogram	59.00
5.20.4	Hot rolled deformed bars	kilogram	60.00
5.20.5	Hard drawn steel wire fabric	kilogram	76.00
5.20.6	Thermo-Mechanically Treated bars.	kilogram	60.00
5.20.7	Add extra for providing reinforcement above Floor two level for every additional floor or part there of.	kilogram	1% of the respective item
5.21	Extra for rendering smooth the top of suspended floors, landings and staircases (treads and risers) with cement mortar 1:2 (1 cement : 2 coarse sand) including a floating coat of neat cement and protecting the surface with a layer of 7.5 cm of earth laid over 15 mm of fine sand in case of suspended floor and bricks laid in mud mortar in case of landings and steps including subsequent removal and cleaning of the same.	sqm	68.00
5.22	Providing and fixing in position copper plate as per design for expansion joints.	kilogram	331.00
5.23	Providing and filling in position, blown bitumen in expansion joints.	per cm depth per cm width per 100m	483.00
5.23.1	Labour rate for Item No. 5.23	- do -	20.00

S.No	Description of Items	Unit	Rate (in Rs)
5.24	Providing and filling in position bitumen mix filler of Proportion 80 kg. of hot bitumen, 1 kg. of cement and 0.25 cubicmeter of coarse sand for expansion joints.	per cm depth per cm width per 100m length	136.00
5.24.1	Labour rate for Item No. 5.24	- do -	19.00
5.25	Providing and fixing in position 12mm thick bitumen impregnated fibre board conforming to IS: 1838 including cost of primer, sealing compound in expansion joints.	per cm depth per cm width per 100m length	414.00
5.25.1	Labour rate for Item No. 5.25	- do -	10.00
5.26	Providing and fixing sheet covering over expansion joints with iron screws as per design to match the colour / shade of wall treatment.	per cm depth per cm width per 100m length	
5.26.1	Non-asbestos fibre cement board 6 mm thick as per IS: 14862. per cm depth per cm width per 100m		
5.26.1.1	150mm wide.	Meter	75.00
5.26.1.2	200mm wide.	Meter	98.00
5.26.2	Aluminium fluted strips 3.15mm thick.		
5.26.2.1	150 mm wide.	Meter	313.00
5.26.2.2	200 mm wide.	Meter	420.00
5.27	Add or deduct for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.	Meter	15.00
5.28	Extra for laying reinforced cement concrete in or under water and/ or liquid mud including cost of pumping or bailing out water and removing slush etc., complete.	cum per meter depth	230.00
5.29	Extra for laying reinforced cement concrete in or under foul positions.	Cum	90.00

S.No	Description of Items	Unit	Rate (in Rs)
5.30	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-20 grade reinforced cement concrete by using 405 kg. of cement per cum of concrete. All work up to floor 2 level.	Cum	5211.00
5.30.1	Labour rate for Item No. 5.30	Cum	942.00
5.31	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-25 grade reinforced cement concrete by using 410 kg. of cement per cum of concrete. All work up to floor 2 level.	Cum	5245.00
5.31.1	Labour rate for Item No. 5.31	Cum	942.00
5.32	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-30 grade reinforced cement concrete by using 420 kg. of cement per cum of concrete. All work up to floor 2 level.	Cum	5310.00
5.32.1	Labour rate for Item No. 5.32	Cum	942.00
5.33	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-35 grade reinforced cement concrete by using 428 kg. of cement per cum of concrete. All work up to floor 2 level.	Cum	5363.00
5.33.1	Labour rate for Item No. 5.33	Cum	942.00

S.No	Description of Items	Unit	Rate (in Rs)
5.34	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-40 grade reinforced cement concrete by using 435 kg. of cement per cum of concrete. All work up to floor 2 level.	Cum	5409.00
5.34.1	Labour rate for Item No. 5.34	Cum	942.00
5.35	Providing and placing in position precast reinforced cement concrete waffle units square or rectangular as per design and shape for floors and roofs in 1:1½:3 (1 Cement : 1½ coarse sand : 3 graded stone aggregate 10mm nominal size) including flush or deep ruled pointing at joints in Cement mortar 1:2 (1 Cement : 2 Fine sand), making necessary holes of required sizes for carrying through service lines etc., providing steel hooks for lifting etc, form work in precasting, handling, hoisting, centering and erection complete for all floor levels but excluding the cost of reinforcement.	Cum	10100.00
5.35.1	Labour rate for Item No. 5.35	Cum	1035.00
5.36	Providing and laying in position ready mixed concrete manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge. M-25 grade Reinforced cement concrete by using 410kg of cement per cum of concrete.All works up to floor IInd level.	Cum	5279.00
5.35.1	Labour rate for Item No. 5.35	Cum	767.00
5.37	Add Extra in respective item for additional floor above floor two level.	Each	93.00
5.38	Providing & Laying, jointing & fixing of pipe with jointing box and bend, elbow etc. in slab before concrete work excluding cost of junction box, bend etc.	RM	4.00

6.0 BRICK WORK

Notes for Specifications :-

Applicable IS Codes
IS 1200 (Part 3): Method of measurements of brick works
IS 1077 : Common burnt clay building bricks.
IS 712 : Specification for building limes.
IS 3495 : Method of test for burnt clay building bricks.

1 This work shall consist of construction of structures with bricks jointed together by cement mortar in accordance with the details shown on the approved drawings or as approved by the competent authority.

2 Burnt clay bricks shall conform to the requirements of IS:1077. They shall be free from cracks and flaws and nodules of free lime. The brick shall have smooth rectangular faces with sharp corners and emit a clear ringing sound when struck.

3 Cement mortar for the work shall be as per details given in Chapter III of this SOR.

4 Fire Bricks shall be as per IS : 1526

5 Fire cly mortar shall be as per IS : 195 :2005

6 All bricks shall be thoroughly soaked in a tank filled with water for a minimum period of one hour prior to being laid. Soaked bricks shall be removed from the tank sufficiently in advance so that they are skin dry at the time of actual laying. Such soaked bricks shall be stacked on a clean place where they are not contaminated with dirt, earth, etc.

7 The thickness of joints shall not exceed 10mm. All joints on exposed faces shall be tooled to give concave finish.

8 The brick work shall be built in uniform layers, and for this purpose wooden straight edge with graduations indicating thickness of each course including joint shall be used. Corners and other advanced work shall be raked back. Brick work shall be done true to plumb or in specified batter. All courses shall be laid truly horizontal and vertical joints shall be truly vertical. Vertical joints in alternate courses shall come directly one over the other. During construction, no part of work shall rise more than one meter above the general construction level, to avoid unequal settlement and improper jointing. Where this is not possible in the opinion of the Engineer in charge, the works shall be raked back according to the bond (and not toothed) at an angle not steeper than 45 degrees with prior approval of the Engineer in charge. Toothing may also be permitted where future extension is contemplated.

9 Where fresh masonry is to join with masonry that is partially/entirely set, the exposed jointing surface of the set masonry shall be cleaned, roughened and wetted, so as to effect the best possible bond with the new work. All loose bricks and mortar or other material shall be removed.

In the case of vertical or inclined joints, it shall be further ensured that proper bond between the old and new masonry is obtained by interlocking the bricks. Any portion of the brick work that has been completed shall remain undisturbed until thoroughly set.

10 Green work shall be protected from rain by suitable covering and shall be kept constantly moist on all faces for a minimum period of seven days. Brick work carried out during the day shall be suitably marked indicating the date on which the work is done so as to keep a watch on the curing period. Watering may be done carefully so as not to disturb or washout the green mortar.

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

During the period of curing of brick work, it shall be suitably protected from all damages. At the close of day's work or for other period of cessation, watering and curing shall have to be maintained. Should the mortar perish i.e. become dry, white or powdery through neglect of curing, work shall be pulled down and rebuilt as directed by the Engineer in charge. If any stains, appear during watering, the same shall be removed from the face.

The scaffolding shall be sound, strong and safe to withstand all loads likely to come upon it. Putlog holes are not allowed.

11 Bricks having crushing strength of more than 40 kg/cm^2. shall be used for load bearing walls.

12 Classification of Bricks and Masonry:-
In this schedule the following three classifications of bricks and masonry is given and shall have the minimum crushing strength when tested according to IS: 1077-1992

(a) Class 40 TM chimney brick/grog or ghol brick: - For this item either selected chimney burnt bricks or ghol bricks are used and superior workmanship than the following varieties is required. The crushing strength when thoroughly soaked in water shall not be less than 40kg/sq.cm.

(b) Class 25 TM chimney brick masonry: - The crushing strength when thoroughly soaked in water shall not be less than 25 kg/sq.cm.

(c) Class 25 TM open bhatta or pajaw a burnt brick :- As is clear the only difference between (b) and (c) varies in the method of burning bricks. The crushing strength when thoroughly soaked in water shall not be less than 25 kg/sq.cm.

13 Periodical sampling and testing of bricks shall be carried out at contractors cost to classify the brick. The record of test results shall be kept with the Executive Engineer, or Authorised officer.

14 When reinforcement is used in 10cm thick brick masonry, minimum lap of reinforcement should be 15cm. In case of wall joints of the main wall, reinforcement should go 15cm into the main wall.

15 Curing :-
The brick work shall be constantly kept moist on all faces for a minimum period of seven days. Brick work done during the day shall be suitably marked indicating the date on which the work is done so as to keep an watch on the curing period.

16 **Measurement :-**
Brick work shall be measured in cubic meters unless otherwise specified. Any extra work over the specified dimensions shall be ignored. Demensions shall be measured correct to the nearest 0.01 m i.e. 1 cm. Areas shall be calculated to the nearest 0.01 sq mtrs and the cubic contents shall be worked out to the nearest 0.01 cubic meters.

Brick work shall be measured separately in the following stages:
(a)) From foundation to floor one level (Plinth level)
(b) Plinth (floor one) level to floor two level
(c) Between two specified floor levels above floor two level
Note : (i) Brick work in parapet walls, mumty, lift machine room and water tanks constructed on the roof upto 1.2 m height above roof shall be measured together with the corresponding work of the floor next below.

No deductions or additions shall be done and no extra payment 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 m^2 in section;

(b) Opening up to 0.1 Sq.m. in area (see Note);
(c) Wall plates, bed plates, and bearing of slabs, chajjas 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 as for hold fasts and holding down bolts;

(e) Iron fixtures, such as wall ties, pipes upto 300 mm diameter and hold fasts for doors and windows; and
(f) Chases of section not exceeding 50 cm in girth.

(g) Bearing portion of drip course, bearing of moulding and cornice.

Note : In calculating area of an opening, any separate lintel or "sills shall be included with the size of the opening but end portions of lintel shall be excluded. Extra width of rebated reveals, if any, shall also be excluded.

Note : Where minimum area is defined for deduction of an opening, void or both, such areas shall refer only to opening or void within the space measured.

Walls half brick thick and less shall each be measured separately in square meters stating thickness.

Walls beyond half brick thickness shall be measured in multiples of half brick which shall be deemed to be inclusive of mortar Joints. For the sizes of bricks specified in 6.1.1, half brick thickness shall mean 100 mm for modular and 115 mm for non-modular bricks.

Where fractions of half brick occur due to architectural or other reasons, measurement shall be as follows:

(a) upto 1/4th brick-actual measurements and

(b) exceeding 1/4 brick-full half bricks.

String courses, projecting pilasters, aprons, sills and other projections shall be fully described and measured separately in running meters stating dimensions of each projection.

Square or rectangular pillars shall be measured separately in cubic meters in multiple of half brick.

Circular pillars shall be measured separately in cubic meters as per actual dimensions.

Brick work curved on plan shall be measured like the brick work in straight walls and shall include all cutting and wastage of bricks, tapered vertical joints and use of extra mortar, if any. Brick work curved on plan to a mean radius not exceeding six meters shall be measured separately and extra shall be payable over the rates for brick work in straight walls. Nothing extra shall be rate payable if the mean radius of the brick work curved in plan exceeds six meters.

Tapered walls shall be measured net as walls and extra payment shall be allowed for making tapered surface for brick work in walls.

Brick work with brick tiles shall be measured and paid for separately.

17 **Rates :-**

The rate includes the cost of materials and labour required for all the operations described above except the vertical reinforcement and its encasement in cement mortar or cement concrete. The rate shall also include the following :

(a) Raking out joints or finishing joints flush as the work proceeds;
(b) Preparing tops of existing walls and the like for raising further new brick work.
(c) Rough cutting and waste for forming gables, splays at eaves and the like.
(d) Leaving holes for pipes upto 150 mm dia. and encasing hold fasts etc.
(e) Rough cutting and waste for brick work curved in plan and for backing to stone or other types of facing.

(f) Embedding in ends of beams, joists, slabs, lintels, sills, trusses etc.

(g) Bedding wall plates, lintels, sills, roof tiles, corrugated sheets, etc. in or on walls if not covered in respective items and

(h) Leaving chases of section not exceeding 50 cm in girth or 350 sq cm in cross-section.

(i) Brick on edge courses, cut brick corners, splays reveals, cavity walls, brick works curved on plan to a mean radius exceeding six meters.

MANDATORY TESTS FOR BRICKS/BRICK TILES					
S.No.	***Material***	***Test***	***Field/ laboratory test***	***Test procedure***	***Minimum Qty of material for carrying out test***
1	***2***	***3***	***4***	***5***	***6***
(i)	Bricks/ Brick tiles	Testing of Bricks/Brick Tiles for dimensions, Compressive strength, Water absorption and efflorescence	Laboratory	As given in specification of Chapter Brick work	As Per given specification chapter
(ii)	Sewer Bricks	Dimensions, Compressive strength, Water absorption and efflorescence	Laboratory	As given in specification of Chapter Brick work	As Per given specification chapter
(iii)	Burnt clay perforated building bricks	- do -	- do -	- do -	- do -
(For Detail Refer UADD BRICK WORK specification / CPWD specification)					

6.0 BRICK WORK			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
6.1	Brick work with well burnt chimney bricks in bulls patent trench kiln manifactured by ghol process,crushing strength not less than 40kg /sqcm and water absorption not more than 15% in foundation and plinth.		
6.1.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	4439.00
6.1.2	Cement mortar 1:6 (1 cement : 6 coarse sand	Cum	4232.00
6.1.3	Labour rate for Item No.- 6.1.1 to 6.1.2	Cum	513.00
6.2	Brick work with well burnt chimney bricks in bulls patent trench kiln ,crushing strength not less than 25kg /sqcm and water absorption not more than 20% in foundation and plinth		
6.2.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	4152.00
6.2.2	Cement mortar 1:6 (1 cement : 6 coarse sand	Cum	3813.00
6.2.3	Labour rate for Item No.- 6.2.1 to 6.2.2	Cum	513.00
6.3	Brick work with chimeny brick of class designation 40 in superstructure above plinth level upto floor 2 level including the cost of scaffolding in :		
6.3.1	Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	4547.00
6.3.2	Cement mortar 1:6(1 cement : 6 coarse sand)	Cum	4220.00
6.3.3	Labour rate for Item No.- 6.3.1	Cum	691.00
6.4	Extra for brick work in superstructure above floor 2 level for each floors or part there of .	Cum	407.00
6.5	Extra for forming cavity 5cm to 7.5cm wide in cavity walls with necessary weep and vent holes including use of cores and cost of providing and fixing bitumastic coated M.S. ties 300mm long of 25x3mm section at not less than 3 ties per sqm as per approved design.	Sqm	63.00
6.5.1	Extra Labour rate for Item No.- 6.5	Sqm	34.00
6.6	Brick work in plain arches in superstructure including centering and shuttering complete for span up to 6 meters with of class designation 40 in cement mortar 1:3 (1 cement : 3 coarse sand).	Cum	6825.00
6.6.1	Labour rate for Item No.- 6.6	Cum	1086.00
6.7	Brick work in gauged arches in superstructure in cement mortar 1:3 (1 cement : 3 coarse sand) including centering and shuttering complete, for span up to 6 meters with of class designation 40.	Cum	7782.00
6.7.1	Labour rate for Item No.- 6.7	Cum	1733.00
6.8	Extra for additional cost of centering for arches exceeding 6m span including all shuttering, bolting, wedging and removal. (Area of the soffit to be measured).	Sqm	412.00
6.8.1	Labour rate for Item No.- 6.8	Sqm	37.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
6.9	Half brick masonry with of class designation 40 in foundation and plinth in.		
6.9.1	Cement mortar 1:3 (1 cement : 3 coarse sand)	Sqm	541.00
6.9.2	Cement mortar 1:4 (1 cement : 4 coarse sand)	Sqm	517.00
6.9.3	Labour rate for Item No.- 6.9.1 to 6.9.2	Sqm	65.00
6.10	Half brick masonry with of class designation 40 in super structure above plinth level up to floor 2 level including the cost of scaffolding.		
6.10.1	Cement mortar 1:3 (1 cement : 3 coarse sand)	Sqm	582.00
6.10.2	Cement mortar 1:4 (1 cement : 4 coarse sand)	Sqm	559.00
6.10.3	Labour rate for Item No.- 6.10.1 to 6.10.2	Sqm	107.00
6.11	Extra for half brick masonry in superstructure, above floor 2 level for every floors or part thereof by mechanical means by lifting material using mobile crane.	Sqm	9.00
6.12	Extra for providing and placing in position 2 Nos. 6mm dia. M.S. bars at every third course of half brick masonry (with of class designation 40).	Sqm	68.00
6.13	Tile brick masonry with tile bricks of class designation 100 in foundation and plinth in:		
6.13.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	4821.00
6.13.2	Cement mortar 1:6 (1 cement : 6 coarse sand).	Cum	4492.00
6.14	Tile brick masonry with machine moulded tile bricks of class designation 125 conforming to IS : 2690 (Part I) -1993 in foundation and plinth in cement mortar 1:6 (1 cement : 6 coarse sand).	Cum	4988.00
6.15	Tile brick masonry with machine moulded tile bricks of class designation 125 conforming to IS : 2690 (Part I) - 1993 in superstructure above plinth level up to floor II level. in cement mortar 1:6 (1 cement : 6 coarse sand) including the cost of scaffolding.	Cum	5397.00
6.15.1	Labour rate for Item No.- 6.15	Cum	789.00
6.16	Extra for tile brick masonry with tile bricks of class designation 100 in superstructure above floor two level for every floor or part thereof.	Cum	305.00
6.17	Tile brick masonry with tile bricks of class designation 100 in plain arch work in superstructure in cement mortar 1:4 (1 cement : 4 coarse sand) including centering and shuttering complete.	Cum	6927.00
6.17.1	Labour rate for Item No.- 6.17	Cum	1029.00
6.18	Tile brick masonry with tile bricks of class designation 100 in gauged arch work in superstructure in cement mortar 1:4 (1 cement : 4 coarse sand) including centering and shuttering complete.	Cum	7442.00
6.18.1	Labour rate for Item No.- 6.18	Cum	1762.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
6.19	Tile brick masonry work 5 cm thick with tile bricks of class designation 100 in cement mortar 1:3 (1 cement : 3 coarse sand) including the cost of scaffolding in superstructure.	Sqm	283.00
6.19.1	Labour rate for Item No.- 6.19	Sqm	85.00
6.20	Honey-comb brick work 10/11.4 cm thick with bricks of class designation 40 in cement mortar 1:4 (1 cement : 4 coarse sand).	Sqm	390.00
6.20.1	Labour rate for Item No.- 6.20	Sqm	34.00
6.21	Extra for laying brick work in or under water and/or liquid mud including cost of pumping or bailing out water and removing slush etc. complete.	per Cum per meter length	
6.21.1	Extra Labour rate for Item No.- 6.21	cum	225.00
6.22	Extra for laying brick work in or under foul position.	Cum	90.00
6.23	Brick work with modular bricks of class designation 40 in exposed brick work including making horizontal and vertical grooves 10mm wide 12mm deep complete from ground level up to plinth level in cement mortar 1:6 (1 cement : 6 coarse sand).	Cum	4063.00
6.23.1	Labour rate for Item No.- 6.23	Cum	380.00
6.24	Brick work with machine moulded modular bricks of class designation 40 in exposed brick work including making horizontal and vertical grooves 10 mm wide 12mm deep complete from ground level up to plinth level in ement mortar 1:6 (1 cement : 6 coarse sand).	Cum	4021.00
6.24.1	Labour rate for Item No.- 6.24	Cum	380.00
6.25	Brick work with machine moulded perforated modular bricks of class designation 125 conforming to IS : 2222 -1991 in exposed brick work including making horizontal and vertical grooves 10 mm wide 12mm deep complete from ground level up to plinth level in cement mortar 1:6 (1 cement : 6 coarse sand).	Cum	5209.00
6.25.1	Labour rate for Item No.- 6.25	Cum	380.00
6.26	Extra for exposed brick work/ clay flyash brick work in superstructure above floor two level, for each floor or part there of.	Cum	305.00
6.27	Brick work with modular fly ash lime bricks (FALG Bricks) conforming to IS:12894-2002, class designation 100 average compressive strength in superstructure above plinth level up to floor 2 level including the cost of scaffolding :		
6.27.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	4123.00
6.27.2	Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	3941.00
6.27.3	Labour rate for Item No.- 6.27.1 to 6.27.2	Cum	743.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
6.28	Brick work with modular calcium silicate bricks machine moulded conforming to IS:4139-1989, class designation 100 average compressive strength in super structure above plinth level up to floor 2 level including scaffolding :		
6.28.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	6103.00
6.28.2	Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	5921.00
6.28.3	Labour rate for Item No.- 6.28.1 to 6.28.2	Cum	743.00
6.29	Brick work with modular extruded brunt fly ash clay sewer bricks (Conforming to IS: 4885 - 1988) in foundation and plinth :		
6.29.1	Cement mortar 1:4 (1 cement : 4 coarse sand)	Cum	5317.00
6.29.2	Labour rate for Item No.- 6.29.1	Cum	417.00
6.30	Brick work with modular extruded brunt fly ash clay sewer bricks (conforming to IS : 4885-1988) in arches in foundation and plinth in cement mortar 1:3 (1 cement : 3 fine sand).	Cum	7792.00
6.31	Providing and laying autoclaved aerated cement blocks masonry with 100mm thick AAC blocks in super structure above plinth level up to floor II level in cement mortar 1:4 (1 cement : 4 coarse sand) The rate includes providing and placing in position 2 Nos. 6 mm dia M.S. bars at every third course of masonry work.	Cum	5910.00
6.31.1	Labour rate for Item No.- 6.31	Cum	475.00
6.32	Extra for AAC block masonry in superstructure above floor II level for every floor or part there of.		
6.32.1	Extra Labour rate for Item No.- 6.32	Cum	136.00
6.33	Providing and laying Gypsum panel partitions 100mm thick with water proof Gypsum panels of size 666x500x100mm, made of calcite phosphor Gypsum fixed with tongue and groove, jointed with bonding plaster as per manufacturers specifications in superstructure above plinth level up to floor 2 level. Gypsum blocks will have a minimum compressive strength of 9.3 kg/cm2	Sqm	824.00
6.33.1	Labour rate for Item No.- 6.33	Sqm	31.00
6.34	Extra for Gypsum panel Partitions in superstructure above floor II level for every floor or part thereof.	Sqm	14.00
6.35	Brick work with mechanized autoclaved flyash lime bricks conforming to IS: 12894 :2002 of class designation 100 in superstructure above plinth level up to floor 2 level in.		
6.35.1	Cement mortar 1:4 (1 cement :4 coarse sand)	Cum	3234.00
6.35.1.1	Labour rate for Item No.- 6.35	Cum	472.00
6.35.2	Cement mortar 1:6 (1 cement :6 coarse sand).	Cum	3026.00
6.35.2.1	Labour rate for Item No.- 6.35	Cum	474.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
6.36	Extra for mechanized autoclave flyash lime bricks conforming to IS: 12894-1990 of class designation 100 in superstructure above floor 2 level for each floor or part thereof.	Cum	136.00
6.37	Brick edging 7cm wide 11.4cm. deep to plinth protection with bricks of class designation 40 including grouting with cement mortar 1:4 (1 cement : 4 fine sand)	Meter	35.00
6.37.1	Labour rate for Item No.- 6.37	Meter	5.00
6.38	Brick work will well burnt open bhatta bricks crushing strength not less than 25kg/cm² and water absoption not more than 20% in foundation and plinth In cm 1:4.	Cum	3136.00
6.38.1	Labour rate for Item No.- 6.38	Cum	465.00
6.39	Brick work will well burnt open bhatta bricks crushing strength not less than 25kg/cm² and water absoption not more than 20% in above plinth level upto floor two level In cm 1:4.	Cum	3310.00
6.39.1	Labour rate for Item No.- 6.39	Cum	568.00
6.40	Deduct from item No. 6.38 & 6.39 if Mortar used 1:6 instead of 1:4.	cum	355.00
6.41	Brick work in plain arches in superstructure including centring and shuttering complete for span upto 6 meters with open bhatta of class designation 25 in cement mortar 1:3 (1 cement: 3 coarse sand).	cum	5678.00
6.41.1	Labour rate for Item No.- 6.41	Cum	754.00
6.42	Brick work in gauged arches in superstructure in cement mortar 1:3 (1 cement : 3 coarse sand) including centring and shuttering complete, for span upto 6 meters with open bhatta of class designation 25.	cum	6532.00
6.42.1	Labour rate for Item No.- 6.42	Cum	1442.00
6.43	Half brick masonry with open bhatta of class designation 25 in foundation and plinth including the cost of scaffolding :		
6.43.1	Cement mortar 1 : 3 (1 cement : 3 coarse sand)	sqm	409.00
6.43.1.1	Labour rate for Item No.- 6.43.1	Sqm	65.00
6.43.2	Cement mortar 1 : 4 (1 cement : 4 coarse sand)	sqm	386.00
6.43.2.1	Labour rate for Item No.- 6.43.2	Sqm	65.00
6.44	Half brick masonry with open bhatta of class designation 25 in superstructure above plinth level upto floor 2 level including the cost of scaffolding.		
6.44.1	Cement mortar 1 : 3 (1 cement : 3 coarse sand)	sqm	451.00
6.44.1.1	Labour rate for Item No.- 6.44.1	Sqm	107.00
6.44.2	Cement mortar 1 : 4 (1 cement : 4 coarse sand)	sqm	428.00
6.44.2.1	Labour rate for Item No.- 6.44.2	Sqm	107.00
6.45	Honey-comb brick work 10/11.4 cm thick with open bhatta brick of class designation 25 in cement mortar in 1:4 (1 cement : 4 coarse sand)	sqm	290.00
6.46	Brick work of fire brick with cly mortar (cly mortar shall be as per IS : 195 : 2005)	cum	16640.00
6.46.1	Labour rate for Item No.- 6.46	Cum	1427.00

7.0 STONE WORK

Notes for specification :-

Applicable IS Codes

IS 1121-(Pt-l) : Methods of determination of properties and strengths of natural building stones (Part-l compressive strength).

IS 1122 : Methods for determination of specific gravity of natural building stone

IS 1124 : Methods of test of determination of water absorption, apparent, specific gravity and porposity of natural building stones.

IS 1200(Pt.IV) : Methods of measurements of building and Civil engineering works stone Masonry.

IS 1197(Pt-l) Code of practice for construction of rubble stone masonry

IS 1597(Pt.ll) Code of practice for construction of ashlar stone masonry

IS 4104(Pt.-l and ll) Code of practice for external facings and veneers.

1 The work shall consist of construction of structures with stone jointed together by cement mortar in accordance with the details shown on the drawings.

2 Stones shall be of the type specified. It shall be hard, sound, free from cracks, decay and weathering and shall be freshly quarried from an approved quarry. Stone with round surface shall not be used.

The stones, when immersed in water for 24 hours, shall not absorb water by more than 5 percent of their dry weight when tested in accordance with IS: 1124.

3 Size of Stones

Normally stones used should be small enough to be lifted and placed by hand. Unless otherwise indicated, the length of stones for stone masonry shall not exceed three times the height and the breadth on base shall not be greater than three-fourth of the thickness of wall, or not less than 150 mm. The height of stone for rubble masonry may be upto 300 mm.

The selection and grading of stones for rubble masonry is largely done at site and the smaller stones are used in the hearting of wall.

4 The type of masonry used for the structures shall be random rubble masonry(coursed or uncoursed) or Coursed rubble masonry (Second Sort) or ashler masonry.

5 The dressing of stone shall be as specified for individual type of masonry work and it shall also conform to the general requirements of IS:1597 and requirement for dressing of stone covered in IS : 1129.

6 Dressing

Each stone shall be hammer dressed on the face, the sides and the beds. Hammer dressing shall enable the stones to be laid close to neighbouring stones such that the bushing in the face shall not project more than 40 mm on the exposed face.

(i) Face stone; At least 25% stones shall be headers tailing into the work at least 2/3rd the thickness of wall in super structure masonry. Such stones shall not be less than 200 sq. cm in cross sections.

(ii) Hearting Stones: The hearting or interior filling of a wall face shall consist of rubble stones not less than 150 mm in any direction, carefully laid, hammered down with a wooden mallet into position and solidly bedded in mortar. The hearting should be laid nearly level with facing and backing.

(iii) Quoin Stone: Quoin stone shall be less than 0.03 cum in volume.

(iv) Jamb stones: The jambs shall not be made with stones specified for quoins except that the stones which were required to be provided at 1 meter centre to centre on both the exposed faces shall here be provided only on the jamb and the length shall be equal to the thickness of the wall for wall upto 60 cm and a line of headers shall be provided for walls thicker than 60 cm as specified for bond.

7 The masonry work shall be laid to lines, levels, curves and shapes as shown in the plan. The height, in each course, shall be kept same and every stone shall be fine tooled on all beds, joints and face full and true. The exposed faces shall be gauged out, grooved, regulated and sunk or plain moulded as the case may be.

8 Stones shall be sufficiently wetted before laying to prevent absorption of water from mortar. Stratified stones must be laid on their natural beds. All bed joints shall be normal to the pressure upon them.

9 Stones in the hearting shall be laid on their broadest face that gives a better opportunity to fill the spaces between stones. The practice of placing loose mortar on the course and pouring water on it to fill the gaps in stones is not acceptable. Mortar may be fluid mixed throughly and then poured in the joints. No dry or hollow space shall be left anywhere in the masonry and each stone shall have all the embedded faces completely covered with mortar.

10 Shaping and dressing shall be done before the stone is laid in the work. No dressing and hammering, which will loosen the masonry, will be allowed after it is once placed. All necessary chases for joggles, dowels and clamps should be formed before hand.

11 Sufficient transverse bonds shall be provided by the use of bond stone extending from the front to the back of the wall and in case of thick wall from outside to the interior and vice versa. In the latter case, bond stones shall overlap each other in their arrangement.

12 In case, headers are not available, precast headers of M 15 concerete shall be used. Castinsitu headers are not permitted.

13 Stones shall break joint on the face for at least half the height of the course and the bond shall be carefully maintained throughout.

14 The practice of building up thin faces tied with occasional through stones and filling up the middle with small stuff or even dry packing is not acceptable.

15 All quoins and the angles of the opening shall be made from selected stones, carefully squared and bedded and arranged to bond alternately long and short in both directions.

16 All vertical joints shall be truly vertical. Vertical joints shall be staggered as far as possible. Distance between the nearer vertical joints of upper layer and lower shall not be less than half the height of the course.

17 Only rectangular shaped bond stones or headers shall be used. Bond stones shall overlap each other by 150mm or more.

18 All connected masonry in a structure shall be carried up nearly at one uniform level throughout but when breaks are unavoidable, the masonry shall be raked in sufficiently long steps to facilitate jointing of old and new work. The stepping of raking shall not be more than 45 degrees with the horizontal.

19 Quoin stone i.e. stone specially selected and neatly dressed for forming an external angle in masonary work, shall not be less than 0.03 cubic meter in volume.

20 The plum stones are selected long stones embedded vertically in the interior of the masonary to form a bond between successive courses and shall be provided at about 900mm. intervals.

21 Courses

The masonry shall be carried out in regular courses of height not exceeding 50 cm and masonry on any day will not be raised more than 60 cm in height when using mortars having compressive strength less than 20 kg./sq. cm at 28 days and 100 cm when using mortars exceeding this strength.

Thickness of Joints

The joint thickness shall not exceed 30 mm at any point on the face. Chips of the stone and spalls shall be wedged into seating bed of face stones to avoid excessive bed thickness. No pinning shall be allowed to avoid excessive joint thickness.

22 Measurement

The length, height and thickness shall be measured correct to a cm. The thickness of wall shall be measured at joints excluding the bushing. Only specified dimensions shall be allowed; anything extra shall be ignored. The quantity shall be calculated in cubic meter nearest to two places of decimal.

The work under the following categories shall be measured separately. (i) From foundation to plinth level .

(a) work in or under water or in liquid mud,

(b) work in or under foul positions.

(i) Above plinth level and upto floor five level.

(ii) Above floor five level to every floor/floors or part thereof.

(iv) Stone masonry in parapet shall be measured together with the corresponding item in the wall of the storey next below.

(a) The length and breadth of the finished work shall be measured correct to a cm. The area of Chajja projecting beyond the wall shall be calculated in sq.m correct to two places of decimal.

In case of sloping chajja, the sloping breadth shall be measured correct to a cm and the area of chajja projecting beyond the wall shall be calculated in sq.m correct to two places of decimal.

Shelves : The length and breadth shall be measured inclusive of bearings correct of a cm. The thickness shall be as specified with permissible tolerance of 2 mm. The area shall be calculated in sqm correct to two places of decimal.

Copings : The dimensions of the circumscribing rectangles of the dressed stones as used in work shall be measured correct to a cm. The cubical contents shall be calculated correct to two places of decimal in cum.

LIST OF MANDATORY TESTS						
Material	Test	Requirement	Field/ laboratory Test	Test Procedure	Minimum Qty. of material for carrying out test	Frequency of Testing
Stone	(i) Water absorption	Not more than 2.5% by mass for sand stone and as specified in IS 1123 for other stones.	Laboratory	IS 1124	50 sqm. for slabs and 10 cum in stone masonry	100sqm/20 cum or part thereof or change of source as per direction of Engineer-in-Charge
	(ii) Transverse strength	Not less than 7 N/mm2 (70 Kgf/cm2) for sand stone and as specified in IS 1123 for other stones	Laboratory	IS 1121 Part II	-do-	-do-
	(iii) Resistance to wear	Not greater than 2 mm on the average and 2.5mm for any individual specimen for sand stone and as specified in IS 1123 for other stones	Laboratory	IS 1706	-do-	-do-
	(iv) Durability	Shall not develop signs of spalling, disintegration or cracks for sand stone and as specified in IS 1123 for other stones.	Laboratory	IS 1126	-do-	-do-
(For Detail Refer UADD STONE WORK specification / CPWD specification)						

7.0 STONE WORK			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
7.1	Random rubble masonry with hard stone in foundation and plinth including levelling up with cement concrete M-5 stone aggregate 20mm nominal size) at plinth level with :		
7.1.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	2671.00
7.1.2	Labour rate for Item No. 7.1.1	Cum	644.00
7.2	Extra for random rubble masonry with hard stone in superstructure above plinth level and upto floor 2 level, including leveling up with cement concrete M-5 stone aggregate 25 mm nominal size at window sills,ceiling level and the like.	Cum	483.00
7.2.1	Extra Labour rate for Item No. 7.2	Cum	213.00
7.3	Extra for random rubble masonry with hard stone in superstructure above floor 2 level for each floor or part thereof.	Cum	407.00
7.4	Extra for random rubble masonry with hard stone in :		
7.4.1	Square or rectangular pillars	Cum	176.00
7.4.2	Circular pillars.	Cum	622.00
7.5	Extra for random rubble masonry with hard stone curved on plan for a mean radius not exceeding 6 m.	Cum	306.00
7.6	Coursed rubble masonry (first sort) with hard stone in foundation and plinth with :		
7.6.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	2970.00
7.6.2	Labour rate for Item No. 7.6.1	Cum	858.00
7.7	Coursed rubble masonry (second sort) with hard stone in foundation & plinth with :		
7.7.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	Cum	2798.00
7.7.2	Labour rate for Item No. 7.7.1	Cum	783.00
7.8	Extra for coursed rubble masonry with hard stone (first or second sort) in superstructure above plinth level & upto 2 floor level.	Cum	442.00
7.9	Extra for coursed rubble masonry with hard stone (first or second sort) in superstructure above floor 2 level for every floors or part thereof.	Cum	407.00
7.10	Extra for coursed rubble masonry with hard stone (first or second sort) in :		
7.10.1	Square or rectangular pillars	Cum	195.00
7.10.2	Circular pillars.	Cum	701.00
7.11	Extra for coursed rubble masonry with hard stone (first or second sort) curved on plan for a mean radius not exceeding 6 m.	Cum	273.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
7.12	Stone work in plain ashlar in super structure upto floor two level in cement mortar 1:6 (1 cement : 6 coarse sand) including pointing with cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade :		
7.12.1	One face dressed.		
7.12.1.1	Red sand stone	Cum	17244.00
7.12.1.2	White sand stone	Cum	18793.00
7.12.1.3	Labour rate for Item No. 7.12.1.1 to 7.12.1.2	Cum	4653.00
7.12.2	Both face dressed.		
7.12.2.1	Red sand stone	Cum	21450.00
7.12.2.2	White sand stone	Cum	22998.00
7.12.2.3	Labour rate for Item No. 7.12.2.1 to 7.12.2.2	Cum	8858.00
7.13	Stone work plain ashlar in arches in cement mortar 1:3 (1 cement : 3 coarse sand) including centring, shuttering and pointing with white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade.		
7.13.1	Red sand stone	Cum	19724.00
7.13.2	White sand stone	Cum	21272.00
7.13.3	Labour rate for Item No. 7.13.1 to 7.13.2	Cum	7073.00
7.14	Stone work plain ashlar in domes in cement mortar 1:3 (1 cement :3 coarse sand) including centring, shuttering and pointing with white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade.		
7.14.1	Red sand stone	Cum	27760.00
7.14.2	White sand stone	Cum	29308.00
7.14.3	Labour rate for Item No. 7.14.1 to 7.14.2	Cum	5191.00
7.15	Stone work ashlar punched (ordinary) in superstructure upto floor two level in cement mortar 1:6 (1 white cement : 6 coarse sand) including pointing with cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade.		
7.15.1	Red sand stone.		
7.15.1.1	One faced punched.	Cum	16638.00
7.15.1.1.1	Labour rate for Item No. 7.15.1.1	Cum	7906.00
7.15.1.1.2	Double faced punched.	Cum	20367.00
7.15.1.1.3	Labour rate for Item No. 7.15.1.2	Cum	11634.00
7.15.2	White sand stone.		
7.15.2.1	One faced punched.	Cum	18186.00
7.15.2.1.1	Labour rate for Item No. 7.15.2.1	Cum	7906.00
7.15.2.2	Double faced punched.	Cum	21915.00
7.15.2.2.1	Labour rate for Item No. 7.15.2.2	Cum	11634.00
7.16	Extra for stone work, plain ashlar or ashlar punched above floor 2 level for every floor or part thereof.	Cum	305.00
7.17	Extra for plain ashlar or ashlar punched in :		
7.17.1	Square or rectangular pillars	Cum	1042.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
7.18	Extra for stone work; plain ashlar or ashlar punched curved on plan with a mean radius not exceeding 6 m.	Cum	725.00
7.19	Extra for additional cost of centering for arches exceeding 6m span including all strutting, bolting, wedging etc. And removal (area of soffit to be measured).	Sqm	505.00
7.20	Stone work sunk or moulded or sunk and moulded upto floor two level in cement mortar 1:6 (1 cement : 6 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade :		
7.20.1	Red sand stone	Cum	21576.00
7.20.1.1	Labour rate for Item No. 7.20.1	Cum	12756.00
7.20.2	White sand stone	Cum	24020.00
7.20.2.1	Labour rate for Item No. 7.20.2	Cum	12756.00
7.21	Extra for stone work sunk or moulded or sunk and moulded or carved in :		
7.21.1	Triangular or Square or rectangular pillars	Cum	2683.00
7.21.2	Circular or polygonal pillars	Cum	4043.00
7.22	Extra for stone work sunk or moulded in cornices.	per meter per cm	14.00
7.23	Stone work (machine cut edges) for wall lining etc. (veneer work) backing filled with a grout of 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade : (To be secured to the backing by means of cramps which shall be paid for separately) :		
7.23.1	Red sand stone - exposed face fine dressed with rough backing.		
7.23.1.1	70 mm thick.	Sqm	1580.00
7.23.1.2	60 mm thick	Sqm	1493.00
7.23.1.3	50 mm thick	Sqm	1405.00
7.23.1.4	40 mm thick	Sqm	1318.00
7.23.1.5	30 mm thick	Sqm	1231.00
7.23.2	Red sand stone - Exposed face machine cut and table rubbed with rough backing.		
7.23.2.1	70 mm thick.	Sqm	1983.00
7.23.2.2	60 mm thick	Sqm	1896.00
7.23.2.3	50 mm thick	Sqm	1808.00
7.23.2.4	40 mm thick	Sqm	1721.00
7.23.2.5	30 mm thick	Sqm	1634.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
7.23.3	White sand stone - exposed face fine dressed with rough backing		
7.23.3.1	70 mm thick.	Sqm	1688.00
7.23.3.2	60 mm thick	Sqm	1586.00
7.23.3.3	50 mm thick	Sqm	1483.00
7.23.3.4	40 mm thick	Sqm	1380.00
7.23.3.5	30 mm thick	Sqm	1281.00
7.23.4	White sand stone - Exposed face machine cut and table rubbed with rough backing.		
7.23.4.1	70 mm thick.	Sqm	2100.00
7.23.4.2	60 mm thick	Sqm	1993.00
7.23.4.3	50 mm thick	Sqm	1886.00
7.23.4.4	40 mm thick	Sqm	1805.00
7.23.4.5	30 mm thick	Sqm	1680.00
7.23.5	Labour rate for Item No.- 7.23.1, 7.23.2, 7.23.3, 7.23.4	Sqm	850.00
7.24	Extra for stone work (veneer work) curved on plan with a mean radius not exceeding 6 m.	Cum	1094.00
7.25	Providing and fixing stainless steel cramps of required size and shape for anchoring stone wall lining to the backing or securing adjacent stones in stone wall lining in cement mortar 1:2 (1 cement : 2 coarse sand) including making the necessary chases in stone and holes in walls wherever required.	Kg	548.00
7.25.1	Labour rate of Item No.- 7.25	kg	163.00
7.26	Providing and fixing stone dowels 10x5x2.50 cm cut to double wedge shape as per design in cement mortar 1:2 (1 cement : 2 coarse sand) including making the necessary chases.	Each	24.00
7.26.1	Labour Rate of Item No.- 7.26	Each	10.00
7.27	Providing and fixing copper pins 7.5 cm long 6 mm diameter for securing adjacent stones in stone wall lining in cement mortar 1:2 (1 cement : 2 coarse sand) including making the necessary chases.	Each	24.00
7.27.1	Labour Rate of Item No.- 7.27	Each	7.00
7.28	Providing and fixing sloping chajja of stone 40 mm thick and upto 80 cm wide beyond the wall as measured along the slope in cement mortar 1:4 (1 cement : 4 coarse sand) with 12mm diameter anchoring steel bar 45 cm long fixed in each stone and supported on and including with bricks cover of class designation 40 in cement mortar 1:4 (1 cement : 4 coarse sand) including pointing in cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade:		
7.28.1	Red sand stone:		

S.No.	Particulars of Items	Unit	Rate (in Rs)
7.28.1.1	With chimney Bricks	Sqm	851.00
7.28.2	White sand stone:		
7.28.2.1	With chimney bricks	Sqm	875.00
7.28.2.2	Labour rate for Item No. 7.28.1.1 and 7.28.2.1	Sqm	314.00
7.29	Providing and fixing horizontal chajja of stone 40 mm thick and upto 80 cm projection in cement mortar 1:4 (1 cement : 4 coarse sand) including pointing in white cement mortar 1:2 (1 white cement :2 stone dust) with an admixture of pigment matching the stone shade:		
7.29.1	Red sand stone:	Sqm	522.00
7.29.2	White sand stone:	Sqm	542.00
7.29.3	Labour rate for Item No. 7.29.1 to 7.29.2	Sqm	209.00
7.30	30mm red sand stone sun-shade (chisel-dressed) supported on red sand stone brackets, fixed in walls with cement mortar 1:4 (1 cement : 4 coarse sand) including finishing complete.	Sqm	514.00
7.30.1	Labour rate for Item No. 7.30	Sqm	251.00
7.31	Providing and fixing red sand stone brackets 55x22.5x45cm sunk and moulded including providing and fixing with 4 Nos. gun metal cramp 25x6mm 30 cm long and dowel bars 7.5 cm long 6 mm dia as per design.	Each	1701.00
7.31.1	Labour rate for Item No. 7.31	Each	633.00
7.32	Stone work, plain in copings, cornices, string courses and plinth courses, upto 75 mm thick in Cement mortar 1:6 (1 cement : 6 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade.		
7.32.1	Red sand stone:	Sqm	22483.00
7.32.2	White sand stone:	Sqm	24032.00
7.32.3	Labour rate for Item No. 7.32.1 to 7.32.2	Sqm	4427.00
7.33	Providing and fixing stone jali 40mm thick throughout in cement mortar 1:3(1cement : 3 coarse sand) including pointing in white cement mortar 1:2 (1white cement:2 stone dust) with an admixture of pigment, matching the stone shade, jali slab without any chamfers etc.		
7.33.1	Red sand stone:	Sqm	4790.00
7.33.2	White sand stone:	Sqm	4810.00
7.33.3	Labour rate for Item No. 7.33.1 to 7.33.2	Sqm	4560.00
7.34	Extra for laying stone work in or under water and/or liquid mud including cost of pumping or bailing out water and removing slush etc. complete.	cum/ mtr depth	225.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
7.35	Extra for laying stone work in or under foul position.	Cum	90.00
7.36	Wall lining butch work upto 10m height with red/ white sand stone 40 mm thick rough facing on the exposed surface with stone strips of minimum length 300 mm and required width including embedding every tenth layer and bottom most layer in masonry or concrete after making necessary chases of size 75x75mm and by providing layer of 75mm thick strips i/c 12mm thick bed of cement mortar 1:3 (1 Cement : 3 coarse sand) i/c ruled pointing in cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment to match the shade of stone complete as per direction of Engineer-in- charge.	Sqm	1085.00
7.36.1	Labour rate for Item No. 7.36	Sqm	247.00
7.37	Stone work (machine cut edges) for wall lining upto 10 m height etc. (Veneer work) backing filled with a grout of 12mm thick cement mortar 1:3 (1 Cement : 3 coarse sand) and jointed with Cement mortar 1:2 (1 cement : 2 stone dust) including rubbing and polishing complete. (To be secured to the backing by means of cramps which shall be paid for separately).		
7.37.1	Kota stone slabs exposed face dressed and rubbed.		
7.37.1.1	25 mm thick	Sqm	939.00
7.37.1.1	Labour rate for Item No. 7.37.1	Sqm	594.00
7.38	Stone tile work for wall lining upto 10 m height with special adhesive over 12mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement with an admixture of pigment to match the stone shade.		
7.38.1	8mm thick (mirror polished and machine cut edge)		
7.38.1.1	Granite stone of any colour and shade.	Sqm	1186.00
7.38.1.2	Raj Nagar plain white marble/ Udaipur green marble/ Zebra black marble.	Sqm	1007.00
7.38.1.3	Labour rate for Item No. 7.38.1.1, 7.38.1.2	Sqm	344.00
7.39	Extra for stone work for wall lining on exterior walls of height more than 10 m from ground level for every additional height of 3m or part there of.	Sqm	57.10
7.39.1	Labour rate for Item No. 7.39	Sqm	25.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
7.40	Providing and fixing dry cladding upto 10 meter heights with 30mm thick gang saw cut stone with (machine cut edges) of uniform colour and size upto 1mx1m, fixed to structural steel frame work and/ or with the help of cramps, pins etc. and sealing the joints with approved weather sealant as per Architectural drawing and direction of Engineer-in-charge. (The steel frame work, stainless steel cramps and pins etc. shall be paid for separately.)		
7.40.1	Red sand stone.	Sqm	1605.00
7.40.2	White sand stone	Sqm	1664.00
7.40.3	Labour rate for Item No. 7.40.1, 7.40.2	Sqm	722.00
7.41	Providing and fixing structural steel frame (for dry cladding with 30 mm thick gang saw cut with machine cut edges sand stone) on walls at all heights using M.S. square/ rectangular tube in the required pattern as per architectural drawing including cost of cutting, bending, welding etc. The frame work shall be supported in wall with the help of MS brackets/ lugs of angle iron/ flats etc. which shall be welded to the frame and embedded in brick wall with cement concrete block of CC grade M-15 stone aggregate 20mm nominal size of size 300x230x300mm including cost of necessary centring and shuttering and with approved expansion hold fasteners on CC/RCC surface including drilling necessary holes.	Kg	104.00
	Approved cramps/ pins etc. shall be welded to the frame work to support stone cladding the steel work will be given a priming coat of Zinc primer as approved by Engineer-in-charge and painted with two or more coats of epoxy paint (Shop drawings shall be submitted by the contractor to the Engineer-in-charge for approval before execution). The frame work shall be fixed in true horizontal & vertical lines/planes. (Only structural steel frame work shall be measured for the purpose of payment, stainless steel cramps shall be paid for separately and nothing extra shall be paid.)		
7.41.1	Labour rate for Item No.7.41	Kg	24.00
7.42	Providing and fixing adjustable stainless steel cramps of approved quality and of required shape and size adjustable with stainless steel nuts bolts and washer (total weight not less than 260 gms) for dry stone cladding fixed on frame work at suitable location including making necessary recesses in stone slab, drilling required holes etc complete as per direction of the Engineer-in-charge.	Each	343.00
7.42.1	Labour rate for Item No.7.42	Each	45.00

8.0 Marble Work Other Than Flooring
Notes for specification

Applicable IS Codes

IS 1122 : Method of test for determination of true specific gravity of natural building stones.

IS 1124 : Method of test for determination of water absorption, apparent specific gravity and porosity of natural building stones.

IS 1130 : Marble (blocks, slabs and tiles).

IS 4101 (Part1) : Code of practice for external facing and veneers: Stone facing.

IS 3316 : Specifications for structural granite

IS 14223 (Part1) : Polished Building Stones (Part-1) Granite

1 Marble work in wall lining etc. (Veneer Work).

Marble slab to be used in wall lining shall be hard, sound, dense, homogeneous and of uniform texture. It shall be uniform in colour and free from stains, cracks, decay and weathering. As far as possible single stone slab shall be used for wall lining but in no case more than 2 slabs shall be permitted to be used to cover the wall height.

2 **CLASSIFICATION**

The marble blocks, slabs and tiles shall be classified broadly in two categories,i.e White Marble & Coloured Marble.

3 **White Marble**

Raj Nagar (plain white) Marble:

It shall be plain white marble with coarse grains predominantly showing mica particles giving reflection in light.

4 **Coloured Marble**

(i) Plain Black Marble

Black marble sawn along veins locally known as 'Peta Pasu sawing' available at Bhainslana.

(ii) Black Zebra Marble

(a) Bhainslana Black Zebra Marble: Black marble having grey or white veins available at Bhainslana.

(b) Kishangarh Black Zebra Marble: Black marble with grey and/or white veins available at Kishangarh.

(c) Abu Black Zebra Marble: Black marble having white patches and streaks available at Abu.

(d) Namaul Black Zebra Marbles: Black marble with thin white veins available at Narnaul.

(e) Makrana Dhobi Doongri Zebra Marble: Greyish black marble with white flowery pattern available at Dhobi Doongri.

(iii) Green Marble

(a) Baroda Green Marble: Dark green marble with flowery pattern available at Baroda.

(b) Abu Green Marble: Light green marble with green and/or brown streaks on white ground available at Ambaji.

(c) Falna Green Marble: Green marble with prominent yellowish pattern available at Falna.

(d) Bundi Green Marble: Green marble with pinkish shades available at Umar, (Bundi).

(iv) Grey Marble

(a) Kumari Grey Marble: Grey marble having light blue shades available at Makrana.

(b) Bundi Grey Marble: Grey Marble with pink or green or black streaks available at Umar (Bundi).

(v) Brown Marble

(a) Bar Brown Marble/Brown Marble with light and dark brown shades available at Bar.

(b) Narnaul Brown Marble

Brown marble having teak wood shades available at Narnaul.

5 **MARBLE JALI**

White marble shall be classified as specified in item no. I above and marble slabs used for making jali shall satisfy minimum requirements for marble slab as specified in head note above.

The marble jali shall be of required thickness and as per pattern specified. All exposed faces shall be fine tooled to a uniform finish. Fixing shall be done with the adjoining working grooves, rivets etc. as shown in the drawing or as specified by the Engineer-in-Charge.

6 **Sizes of Marble Blocks,**

The size of marble blocks, slabs and tiles shall be as mentioned in Table 8.1.

TABLE 8.1

Sizes of Marble Blocks, Slabs and Tiles

		Length (in c.m)	Width (in c.m)	Thickness (in c.m)
1	Blocks	30 to 250	30 to 100	30 to 90
2	Slabs	70 to 250	30 to 100	2 to 15
3	Tiles	10 to 60	10 to 60	0.8 to 2.4

Notes

(1) The length and width, of the blocks shall be in multiple of 30 cm.

(2) Length and width of slab shall be in multiple of 10 cm. and thickness in multiple of 1 cm.

(3) Tiles shall be square cut and linear dimensions in multiple of 10 cm.

(4) Only slabs and tiles shall be machine cut and factory made.

(5) For 8 mm thick tiles, special precautions will be required for fixing them like using special adhesive as per manufacturer's specifications. Such tiles are not suitable for outside veneering work exposed to rains/sun if used in large areas in continuous stretches. For tiles of thickness 20 mm and above cramps may be provided if approved by Engineer-in-Charge.

7 **Dressing, Cutting and Rubbing**

Every marble stone shall be gang saw/machine cut to the required size and shape, chisel dressed machine finished on all beds and joints, so as to be free from any waviness and to give truly vertical,horizontal, radial or circular joints as required. The exposed faces and sides of stones forming joints upto 6mm. from the face shall be fine tooled machine cut such that a straight edge laid along the face of the stone is in contact with every point on it. All window sills, tread of steps, counters vanities moulding edges etc. shall be machine cut & polished to give high gloss mirror finish as per direction of Engineer-in-Charge. These surfaces shall then be rubbed smooth. All visible angles and edges shall be true, square and free from chipping. Beyond the depth of 6 mm from face, the joints shall be dressed with a slight splay so that the thickness of joint increases, in an inverted V shape. The surfaces of the stones coming in contact with backing need not be chisel dressed.A sample of dressed and rubbed stone shall be prepared for approval and it shall be kept on worksite after being approved by the Engineer-in Charge.

8 **Laying**

The stone shall be wetted before laying. They shall then be fixed with mortar in position without the use of chips or under pinning of any sort. Care shall be taken to match the grains of veneer work as directed by the Engineer-in-Charge.For purpose of matching the grains, the marble slabs shall be selected judiciously having uniform pattern of veins/streaks.Preferably the slabs shall be those got out of the same block from the quarry. The area to be veneered shall be reproduced on the ground and the marble slabs laid in position and arranged in the manner to give the desired matching of grains.Any adjustment needed for achieving the best results shall be then carried out by replacing or interchanging the particular slabs. Special care shall be taken to achieve the continuity of grains between the two slabs one above the other along the horizontal joints.This shall then be got approved by the Engineer-in-Charge and each marble slabs numbered properly and the same number shall be marked on a separate drawing as well as on the surface to be actually veneered,so as to ensure the fixing of the particular slabs in the correct location.

For the facing of the columns also the same procedure as mentioned above shall be followed.

9 **Joints**

All joints shall be full of mortar. Special care shall be taken to see that groundings for veneer work are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and relaid. The thickness of the face joints shall be uniform, straight and as fine as possible, not more than 1.5 mm and in the face joint, the top 6 mm depth shall be filled with mortar specified for the pointing.

10 **Curing**

The work shall be kept constantly moist on all faces for a period of atleast seven days.

11 **Grinding and Finishing**

After the marble work is cured, it shall be rubbed with carborandum stone of different grades no. 60, 120 and 320 in succession or with electrical rubbing machines rubbed with carborandum items 0 to 6 nos.in succession, so as to give a plane true and highly smooth surface. It shall then be cleaned with a solution of oxalic acid, washed and finished clean.

12 **Measurements**

The length and breadth shall be measured correct to a cm. In case of radially dressed or circular slabs used in the work, the dimensions of the circumscribing rectangles of the dressed stone used in the work, shall be measured & paid for. The area shall be calculated in sqm nearest to two places of decimal.

List of Mandatory Test

Material	*Test*	*Field/ Laboratory Test*	*Test Procedure*	*Minimum quantity of material/ work for carrying out the test*	*Frequency of testing*
Marble	(i) Moisture Absorption	Laboratory	IS 1124	50 Sq.m.	100 sqm. or part thereof.
	(ii) Hardness Test	-do-	Mho's Scale	-do-	-do-
	(iii) Specific Gravity	-do-	IS 1122	-do- .	-do-
Granite	(i) Moisture	-do-	1S1124	-do-	-do-
	(ii) Specific Gravity	-do-	IS 1122	-do- .	-do-

13 **Rates**

The rate includes the cost of materials and labour required for all the operations described above except for the cost of providing and fixing of dowel and cramps which shall be paid for separately, unless otherwise stipulated in the item of work.

(For Detail Refer UADD Marble Work specification / CPWD specification)

8.0 Marble Work Other Than Flooring			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
8.1	Marble work gang saw cut (polished and machine cut)of thickness 16mm 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) with an admixture of pigment to match the marble shade:(To be secured to the backing by means of cramps, which shall be paid for separately).		
8.1.1	**Raj Nagar Plain white marble**		
(a)	Area of slab upto 0.50 sqm	Sqm	1493.00
(b)	Area of slab over 0.50 sqm	Sqm	1625.00
8.1.2	**Udaipur green marble**		
(a)	Area of slab upto 0.50 sqm	Sqm	1774.00
(b)	Area of slab over 0.50 sqm	Sqm	1930.00
8.1.3	**Zebra black marble**		
(a)	Area of slab upto 0.50 sqm	Sqm	1774.00
(b)	Area of slab over 0.50 sqm	Sqm	1945.00
8.1.4	**Makrana Marble**		
(a)	Area of slab upto 0.50 sqm	Sqm	2114.00
(b)	Area of slab over 0.50 sqm	Sqm	2413.00
8.1.5	**Katni Marble**		
(a)	Area of slab upto 0.50 sqm	Sqm	1863.00
(b)	Area of slab over 0.50 sqm	Sqm	2076.00
8.1.6	Labour rate for upto 0.50 sqm	Sqm	815.00
8.1.7	Labour rate for Above 0.50 sqm	Sqm	821.00
8.2	Providing and fixing 16mm thick gang saw cut mirror polished premoulded and prepolished) machine cut for kitchen platforms, vanity counters, window sills , facias and similar locations of required size of approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edge to give high gloss finish etc. complete at all levels.		
8.2.1	**Raj Nagar Plain white marble**		
(a)	Area of slab upto 0.50 sqm.	Sqm	1266.00
(b)	Area of slab over 0.50 sqm.	Sqm	1382.00
8.2.2	**Udaipur green marble**		
(a)	Area of slab upto 0.50 sqm.	Sqm	1512.00
(b)	Area of slab over 0.50 sqm.	Sqm	1648.00
8.2.3	**Zebra black marble**		
(a)	Area of slab upto 0.50 sqm.	Sqm	1512.00
(b)	Area of slab over 0.50 sqm.	Sqm	1662.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
8.2.4	**Makrana Marble**		
(a)	Area of slab upto 0.50 sqm.	Sqm	1809.00
(b)	Area of slab over 0.50 sqm.	Sqm	2071.00
8.2.5	**Katni Marble**		
(a)	Area of slab upto 0.50 sqm.	Sqm	1589.00
(b)	Area of slab over 0.50 sqm.	Sqm	1776.00
8.2.6	Labour rate for upto 0.50 sqm	Sqm	567.00
8.2.7	Labour rate for Above 0.50 sqm	Sqm	567.00
8.2.8	**Granite of any colour and shade**		
8.2.8.1	Area of slab upto 0.50 sqm	Sqm	2394.00
8.2.8.2	Area of slab over 0.50 sqm.	Sqm	2544.00
8.2.9	Labour rate for Item No. 8.2.8.1	Sqm	567.00
8.2.10	Labour rate for Item No. 8.2.8.2	Sqm	567.00
8.3	Extra for providing full edge moulding to 16mm thick marble stone counters, Vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in- Charge.		
8.3.1	Marble work	meter	99.00
8.3.2	Granite work.	meter	146.00
8.4	Extra for fixing marble /granite stone over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive including cleaning etc. complete.	meter	138.00
8.5	Extra for providing opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete.	Each	199.00
8.6	Mirror polishing on marble work/Granite work/stone work where ever required to give high gloss finish complete.	Sqm	112.00
8.7	Providing and fixing cramps of required size & shape in RCC/ CC backing with cement mortar 1:2 (1 cement :2 coarse sand) including drilling necessary hole in stones and embedding the cramp in the hole (fastener to be paid separately).		
8.7.1	Gunmetal cramps.	Kg	544.00
8.7.1.1	Labour rate for Item No.-8.7.1	Kg.	74.00
8.7.2	Stainless steel cramps.	Kg	570.00
8.7.2.1	Labour rate for Item No.-8.7.2	Kg.	82.00
8.8	Providing and fixing expansion hold fasteners on C.C. /R.C.C. surface backing including drilling necessary holes and the cost of bolt etc complete.		
8.8.1	Wedge expansion type		

S.No.	Particulars of Items	Unit	Rate (in Rs)
8.8.1.1	Fastener with threaded dia 6 mm.	Each	22.00
8.8.1.2	Fastener with threaded dia 10 mm.	Each	25.00
8.8.1.3	Fastener with threaded dia 12 mm.	Each	39.00
8.8.1.4	Labour rate for Item No. 8.8.1.1 to 8.8.1.3	Each	3.00
8.9	Stone tile (polished) work for wall lining over 12mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and cement slurry @ 3.3 kg/sqm including pointing in white cement complete.		
8.9.1	8mm thick.		
8.9.1.1	Raj nagar plain white marble/ Udaipur green marble/ Zebra black marble.	Sqm	1063.00
8.9.1.2	Granite of any colour and shade.	Sqm	1272.00
8.9.1.3	Labour rate for Item No. 8.9.1.1 to 8.9.1.2	Sqm	419.00
8.10	Providing and fixing stone slab table rubbed, edges rounded and polished of size 75x50 cm deep and 1.8 cm thick fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) as per direction of Engineer-in-charge and finished smooth.		
8.10.1	White Agaria Marble Stone.	Sqm	2553.00
8.10.2	Granite Stone of approved shade.	Sqm	2824.00
8.10.3	Labour rate for Item No. 8.10.1 to 8.10.2	Sqm	270.00

9.0 WOOD AND P.V.C. Work

Notes for Specifications :-

Applicable IS Codes

IS 204 (Part I) : Specification for tower bolts (ferrous bolt)

IS 204 (Part 11) Specification for tower bolts (non ferrous metals)

IS 205 Specification for non ferrous metal butt hinges

IS 206 Specification for Tee and strap hinges

IS 207 Specification for Gate and shutter hook and eye

IS 281 Specification for mild steel door bolts for use with pad locks

IS 303 Specification for plywood for general purposes

IS 362 Specification for parliament hinges

IS 363 Specification for hasps and stapple

IS 364 Specification for fan light catch

IS 419 Putty for use on window frames

IS 451 Technical supply condition for wood screws

IS 452 Specification for door spring rat tail type

IS 453 Specification for double acting spring hinge

IS 707 Glossary of terms applicable to timber technology and utilization

lS723 Specification for steel counter sunk head wire nails.

IS 729 Specification for drawer lock, cup board lock and box locks

IS 848 Specification for synthetic resin adhesive for plywood (phenoic and amino plastic)

IS 851 Specification for synthetic resin adhesive for const. work (non structural in wood)

IS 1003 (Part I) Specification for timber panelled and glazed shutter Part I (door shutters)

IS 1003 (Part II) Specification for timber panelled and glazed shutter Part II (window and ventilator shutter)

IS 1141 Specification for code of practice for seasoning of timber

IS 1200 Part XIV Method of measurement of building and civil engg work glazing.

IS 1200 Part XII Wood work and joinery

IS 1328 Specification for veneered decorative plywood

IS 1341 Specification for steel butt hinges

IS 1378 Specification for oxidized copper finishes

IS 1566 Specification for hard drawn steel wire fabric

IS 1568 Specification for wire cloth for general purpose

IS 1658 Specification for hard drawn steel wire fabric

IS 1659 Specification for block boards

IS 1734 Determination of density and moisture content,

IS 1823 Specification for floor door stopper

IS 1868 Specification for anodic coating on aluminium and its alloy

IS 2046 -do- Decorative thermosetting synthetic resin bonded laminated sheet

IS 2095 Specification for gypsum plaster board

IS 2202 (Pt I) Specification for wooden flush door shutter, solid core type (plywood face panels)

IS 2202 (Part II) -do- (Particle boards and hard board face panels)

IS 2209 Specification for mortice lock (Vertical Type)

IS 2380 Method of test for wood particle board and board for lignocelluloses material

IS 2547 Specification for gypsum plaster
IS 2681 Specification for non-ferrous metal sliding door bolts use with pad locks
IS 3087 Specification for wood particle boards (Medium density) for general purpose.
IS 3097 Specification for veneered particle board
IS 3818 Specification for continuous (Piano) hinges
IS 3847 Specification for mortice night latch
IS 4948 Specification for welded steel wire fabric for general use
IS 4992 Specification for rebated mortice lock
IS 5187 Specification for flush bolts
IS 5509 Specification for Fire Retardant Plywood
IS 5930 Specification for mortice latch
IS 6318 Specification for plastic wire window fastners
IS 6607 Specification for rebated mortice lock (Vertical type)
IS 6760 Specification for sloted counter sunk head wood screws.
IS 7196 Specification for hold fast
IS 7534 Specification for sliding locking bolts for use with pad lock
IS 8756 Specification for mortice ball catch for use in wooden almirah
IS 9308 (Part II) Specification for mechanically extracted coir fibres. (Mattress coir fibres)
IS 9308 (Part III) -do- Decorated coir fibre
IS 12049 Dimensions and tolerance relating to wood based panel materials
IS 12406 Specification for medium density fibre board
IS 12817 Specification for stainless steel Butt Hinges
IS 12823 Specification for wood products -Prelaminated particle Boards
IS 14616 Specifications for laminated veneer lumber
IS 14842 Specification for coir veneer board for general purposes
IS 14856 Specification for glass fibre reinforced plastic (FRP) panel type door
IS 14900 Specifications for transparent float glass

Definition

1 **Best:-**
Refers to the quality of materials and workmanship, shall mean that in the opinion of the concerned Engineer-in-Charge, there is no superior material or article or class of workmanship obtainable in the market

2 **Ballies: -**
Thin round poles usually without bark.

3 **Beam: -**

4 **Cross Band**
A general term indicating a transverse layer of veneer or veneers in composite wood products.

5 **Decorative Veneers**
Veneers having attractive appearance due to figure, colour, grain, lusture, etc.

6 **Hard Wood**

7 **Freeze Rail**
Horizontal member, mortised or otherwise secured to the stiles of a door, provided just below the freeze panel usually provided for decorative purposes in the uppermost portion of the door.

8 **Joint**
A prepared connection for joining adjacent pieces of wood. veneer, etc.

9 Muntin

Small horizontal or vertical dividing bars within basic framework of a window, or door subdividing and supporting the glass panes or panels of doors.

10 Particle Board

A board manufactured from particles of wood or other lignocellulose material, for example, flakes, granules, shavings, slivers, splinter agglomerated, formed and pressed together by use of an organic binder together with one or more of the agents, such as heat, pressure, moisture and a catalyst.

11 Particle

Distinct particle or fraction of wood, or other lignocellulose material produced mechanically for use as the aggregate for making a particle board. This may be in the form of flake, granule, shaving, splinter and sliver.

12 Plywood

A board formed of three or more layers of veneers cemented or glued together, usually with the grain of adjacent veneers running at right angles to each other.

13 Seasoning

A process involving the reduction of moisture content in timber under more or less controlled conditions towards or to an amount suitable for the purpose for which it is to be used.

14 Seasoned Timber

Timber whose moisture content has been reduced to the specified minimum, under more or less controlled processes of drying.

15 First Class Wood

Individual hard and sound knots shall not be more than 25 mm in diameter and the aggregate area of all the knots shall not exceed one per cent of the area of the piece.

16 Second Class Wood

Individual hard and sound knot shall not be more than 40 mm in diameter and aggregate of all the knots shall not exceed one and half per cent of the area of the piece. Wood shall be generally free from sapwood, but traces of sapwood may be allowed.

FRAMED WORK:

1 The timber used in the work shall conform to IS: 883.

2 Rates include cost of all materials i.e. timber spikes, nails, screws, glue etc. required for the work. Rates also include cost of all labour for making, hosting, erecting and fixing in possition.

3 Timber discribed as “Framed and Fixed” timber include:-

3.1 Joints in wood work are not permitted. Unless otherwise specified, all joints shall be simple tenon and mortice joints.

3.2 Lapping, having, tabling, scarping, notching, birds mouth cutting, splayed or bevelled ends.

3.3 Framing together with mortise and tenon tusk tenon or dovetailed joints.

3.4 Framed joinery put together with white lead or glue in joints and pinned with hard wood or bamboo pins.

3.5 Boring for bolts.

3.6 Hoisting erecting and fixing in position.

3.7 Small labours like splays, chambers, rounded angles and rounded nosing.

Abbreviation

Grade BWR- Boiling water resistant for coir veneer board
Grade MR - Moisher resistant for coir veneer board
FPT - Flat pressed three layer
PTMT - Polytetra Methyline Tetraphthalate
UPVC - Unplasticized Polyvinyl chloride

SHUTTERS :

1 For all hard wood shutters, timber shall conform to IS : 883.

2 For factory made panelled shutters approved hard wood as per IS : 4021 duly kiln seasoned as per IS : 1141 shall only be accepted.

3 Flush doors with solid block board core shall conform to IS:2201-1973.

6 Glass panes shall conform to IS : 1761.

7 Teak wood shall be used with the government permission.

Measurements

Wood work shall be measured for finished dimensions. No allowance shall be made for dimensions supplied beyond those specified. Length of each piece shall be measured over all nearest to a cm. so as to include projections for tenons, scarves or mitres. Width and thickness shall be measured to the nearest mm. Cubical contents can be worked out in units cubic meters upto 3 places of decimal in whole numbers.

Framework of Shutters : The overall length and width of the framework of the shutters shall be measured nearest to a cm in fixed position (overlaps not to be measured in case of double leaved shutters) and the area calculated in square meters correct to two places of decimal. No deduction shall be made to form panel openings or louvers. No extra payments shall be made for shape, joints and labour involved in all operations described above.

For panelling of each type or for glazed panel length and width of opening for panels inserts

MANDATORY TESTS FOR WOOD & P.V.C. WORK

Material	Test	Field/ Laboratory Test	Test Procedure	Minimum quantity of material/ work for carrying out the test	Frequency of testing
Timber	Moisture content	Field by moisture	As given in specification	1 cum	Every one cum or part thereof.
Flush door	End immersion Test knife test Adhesion Test	Laboratory	IS 2202	26 shutters	As per sampling and testing specified in specification clause 9.7.11
Mortice	Testing of spring	Laboratory	IS 2209	50 Nos	100 or part thereof.

Rates :

The rate includes the cost of material and labour involved.

(For Detail Refer UADD Wood & PVC work specification / CPWD specification)

9.0 WOOD AND P.V.C. WORK			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
9.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position :		
9.1.1	Second class teak wood	Cum	83137.00
9.1.2	Other then teak wood	Cum	65973.00
9.1.3	Kiln seasoned and chemically treated Hollock wood.	Cum	43816.00
9.1.4	Labour rate for Item No.- 9.1.1 to 9.1.3	Cum	4577.00
9.2	Providing laminated veneer lumber conforming to IS:14616 and TAD -15: 2001 (Part B) in factory made frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position as per directions of Engineer-in-charge.	Cum	94925.00
9.3	Providing wood work in frames of false ceiling, partitions etc. sawn and put up in position :		
9.3.1	Other then teak wood	Cum	64135.00
9.3.2	Kiln seasoned and chemically treated Hollock wood.	Cum	41920.00
9.3.3	Labour rate for Item No.- 9.3.1, 9.3.2	Cum	3025.00
9.4	Extra for additional labour for circular works, such as in frames of fan light:		
9.4.1	Second class teak wood	Cum	8314.00
9.4.2	Other then teak wood	Cum	6597.00
9.4.3	Kiln seasoned and chemically treated Hollock wood.	Cum	4382.00
9.5	Providing and fixing panelled or panelled and glazed shutters for doors, windows and clerestory windows including ISI marked black enamelled M.S butt hinges with necessary screws excluding, panelling which will be paid for separately.		
9.5.1	Second class teak wood		
9.5.1.1	35 mm thick shutters	Sqm	2290.00
9.5.1.2	30 mm thick shutters	Sqm	2019.00
9.5.2	Kiln seasoned and chemically treated Hollock wood.		
9.5.2.1	35 mm thick shutters	Sqm	1294.00
9.5.2.2	30 mm thick shutters	Sqm	1160.00
9.5.2.3	Labour rate for Item No.- 9.5.1 to 9.5.2.2	Sqm	249.00
9.6	Providing and fixing 35 mm thick factory made laminated veneer lumber door shutter conforming to IS : 14616 and TADS 15:2001 (Part B) including ISI marked black enameled M.S. butt hinges with necessary screws as per directions of Engineer-in-charge and panelling with panels of:		
9.6.1	12mm thick plain grade -1,medium density flat pressed three layer particle board FPT-1 (Flat pressed three layer) or graded wood particle board FPT-1 IS:3087 marked bonded with BWP type synthetic resin adhesive as per IS : 848 :	Sqm	2223.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.6.2	12 mm thick pre-laminated particle board (decorative lamination on both sides) grade - 1, medium density flat pressed, three layer particle board FPT - I or graded wood particle board FPT - I, conforming to IS : 3087 bonded with BWP type synthetic resin adhesive as per IS : 848 and pre- laminated conforming to IS : 12823 Grade 1, Type - II marked:	Sqm	2398.00
9.6.2.1	9 mm thick pre-laminated particle board(decorative lamination on both sides) grade - 1, medium density flat pressed, three layer particle board FPT-I or graded wood particle board FPT - I, conforming to IS:3087 bonded with BWP type synthetic resin adhesive as per IS:848 and pre- laminated conforming to IS : 12823 Grade 1, Type - II marked.	Sqm	2009.00
9.6.3	12 mm thick one side Pre-laminated particle board (decorative lamination on one side and other sides balancing lamination) grade - 1 medium density flat pressed, three layer particle board FPT - I or graded wood particle board FPT-1 conforming to IS : 3087 bonded with BWP type synthetic resin adhesive as per IS : 848 and pre-laminated conforming to IS : 12823 Grade -1, Type II marked:	Sqm	2305.00
9.6.1.1	Labour rate for Item No.- 9.6.1, 9.6.2,9.6.2.1 & 9.6.3	Sqm	97.00
9.7	Providing and fixing panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (Area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25 mm to 40 mm thick :		
9.7.1	Second class teak wood	Sqm	1804.00
9.7.1.2	Labour rate for Item No.- 9.7.1	Sqm	192.00
9.7.2	Kiln seasoned and chemically treated Hollock wood	Sqm	1007.00
9.7.2.1	Labour rate for Item No.-9.7.2	Sqm	195.00
9.7.3	Ply wood 5 ply, 9 mm thick :		
9.7.3.1	Decorative plywood both side decorative veneer (Type - I) conforming to IS 1328 BWR type.	Sqm	1527.00
9.7.3.1.1	Labour rate for Item No.- 9.7.3.1	Sqm	192.00
9.7.3.2	Decorative plywood one side decorative veneer and commercial veneer on other face (Type 1) conforming to IS 1328 BWR Type	Sqm	1270.00
9.7.3.2.1	Labour rate for Item No.- 9.7.3.2	Sqm	192.00
9.7.4	Ply wood 7 ply, 9 mm thick		
9.7.4.1	Decorative plywood one side decorative veneer and commercial veneer on other face (Type 1) conforming to IS 1328 BWR Type	Sqm	1302.00
9.7.4.1.1	Labour rate for Item No.- 9.7.4.1	Sqm	192.00
9.7.5	Particle Board 12 mm thick		
9.7.5.1	Plain particle board flat pressed, 3 layer or graded wood particle board medium density Grade I, IS : 3087 marked.	Sqm	736.00
9.7.5.1.1	Labour rate for Item No.- 9.7.5.1	Sqm	192.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.7.5.2	Veneered flat pressed three layer or graded wood particle board with commercial veneering on both sides conforming to IS:3097, grade I.	Sqm	861.00
9.7.5.2.1	Labour rate for Item No.- 9.7.5.2	Sqm	192.00
9.7.5.3	Pre-laminated particle board with decorative lamination on one side and balancing lamination on other side, Grade I, Type II IS: 12823 marked.	Sqm	1152.00
9.7.5.3.1	Labour rate for Item No.- 9.7.5.3	Sqm	192.00
9.7.5.4	Pre-laminated particle board with decorative lamination on both sides, Grade I, Type II, IS:12823 marked.	Sqm	1194.00
9.7.5.4.1	Labour rate for Item No.- 9.7.5.4	Sqm	192.00
9.8	Providing and fixing panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25 mm to 40 mm thick. Coir veneer board (conforming to IS : 14842-2000) :		
9.8.1	12 mm thick	Sqm	1058.00
9.8.2	Labour rate for Item No.- 9.8.1	Sqm	192.00
9.9	Providing and fixing glazed shutters for doors, windows and clerestory windows using 4 mm thick float glass panes including black enamelled ISI marked M.S butt hinges with necessary screws.		
9.9.1	Second class teak wood		
9.9.1.1	35 mm thick	Sqm	2799.00
9.9.1.2	30 mm thick	Sqm	2489.00
9.9.2	Kiln seasoned and chemically treated Hollock wood		
9.9.2.1	35 mm thick	Sqm	1666.00
9.9.2.2	30 mm thick	Sqm	1516.00
9.9.2.3	Labour rate for Item No.- 9.9.1 to 9.9.2.3	Sqm	272.00
9.10	Providing and fixing factory made laminated veneer lumber glazed shutter conforming to IS: 14616 and TADS 15:2001 (Part B) , using 4mm thick float glass panes for doors, windows and clerestory windows including ISI marked black enamelled M.S butt hinges with necessary screws as per directions of Engineer-in-charge.		
9.10.1	30 mm thick shutters	Sqm	2006.00
9.10.2	Labour rate for Item No.- 9.10.1	Sqm	97.00
9.11	Extra for providing heavy sheet float glass panes instead of ordinary float glass in glazed doors, windows and clerestory window shutters. (Area of opening for glass panes excluding portion inside rebate shall be measured)		
9.11.1	5.5 mm thick instead of 4 mm thick.	Sqm	163.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.12	Extra for providing frosted glass panes 4 mm thick instead of ordinary float glass panes 4 mm thick in doors, windows and clerestory window shutters. (Area of opening for glass panes excluding portion inside rebateshall be measured).	Sqm	180.00
9.13	Deduct for providing pin headed glass panes instead of ordinary float glass panes weighing 4 mm thick in doors, windows and clerestory windows, shutters (Area of opening for glass panes excluding portion inside rebate shall be measured).	Sqm	143.00
9.14	Extra for providing ISI marked Stainless Steel butt hinges instead of black enamelled M.S. butt hinges with necessary screws. (Shutter area to be measured).	Sqm	97.00
9.15	Deduct if fixed shutters (without hinges) are provided instead of openable shutters for doors, windows or clerestory windows with :		
9.15.1	Stainless steel butt hinges with stainless steel screws :		
9.15.1.1	For 2nd class teak wood and other inferior class of wood shutters.	Sqm	142.00
9.15.2	Black enamelled M.S. butt hinges with necessary screws.		
9.15.2.1	For 2nd class teak wood and other inferior class of wood shutters.	Sqm	45.00
9.16	Providing and fixing 25 mm thick shutters for cup board etc. :		
9.16.1	Panelled or panelled & glazed shutters :		
9.16.1.1	Second class teak wood including ISI marked anodised aluminium butt hinges with necessary screws.	Sqm	2154.00
9.16.1.1.1	Labour rate for Item No.- 9.16.1.1	Sqm	353.00
9.16.2	Glazed shutters :		
9.16.2.1	Second class teak wood including ISI marked anodised aluminium butt hinges with necessary screws.	Sqm	2216.00
9.16.2.1.1	Labour rate for Item No.- 9.16.2.1	Sqm	295.00
9.17	Providing and fixing flat pressed 3 layer particle board medium density exterior grade (Grade I) or graded wood particle board IS : 3087 marked to frame, backing or studding with screws etc. complete (Frames, backing or studding to be paid separately) :		
9.17.1	12 mm thick	Sqm	539.00
9.17.2	18 mm thick	Sqm	601.00
9.17.3	Labour rate for Item No.- 9.17.1, 9.17.2	Sqm	56.00
9.18	Providing and fixing Pre-laminated flat pressed 3 layer (medium density) particle board or graded wood particle board IS : 3087 marked with one side decorative and other side balancing lamination Grade I, Type II exterior grade IS : 12823 marked in shelves with screws and fittings wherever required, edges to be painted with polyurethane primer (fittings to be paid separately).		

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.18.1	18 mm thick	Sqm	1064.00
9.18.2	25 mm thick	Sqm	1150.00
9.18.3	Labour rate for Item No.- 9.18.1, 9.18.2	Sqm	75.00
9.19	Providing and fixing 25 mm thick shutters for cupboards etc. including ISI marked black enamelled M.S. butt hinges with necessary screws :		
9.19.1	Panelled or panelled and glazed shutters		
9.19.1.1	Second class teak wood	Sqm	2090.00
9.19.1.1.1	Labour rate for Item No.- 9.19.1.1	Sqm	345.00
9.19.2	Glazed shutters		
9.19.2.1	Second class teak wood	Sqm	2218.00
9.19.2.1.1	Labour rate for Item No.- 9.19.2.1	Sqm	295.00
9.20	Providing and fixing ISI marked flush door shutters conforming to IS: 2202 (Part I) **decorative type**, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters using following hinges.		
9.20.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	Sqm	2100.00
9.20.2	30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	Sqm	1926.00
9.20.3	25 mm thick (for cupboard) including ISI marked nickel plated bright finished M.S. Piano hinges IS : 3818 marked with necessary screws.	Sqm	1674.00
9.20.4	Labour rate for Item No.- 9.20.1, 9.20.2, 9.20.3	Sqm	103.00
9.21	Providing and fixing ISI marked flush door shutters conforming to IS: 2202 (Part I) **non-decorative type**, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters using following hinges.		
9.21.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	Sqm	1519.00
9.21.2	30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	Sqm	1345.00
9.21.3	25 mm thick (for cupboard) including ISI marked nickel plated bright finished M.S. Piano hinges IS : 3818 marked with	Sqm	1152.00
9.21.4	Labour rate for Item No.- 9.21.1, 9.21.2, 9.21.3	Sqm	103.00
9.22	Extra for Providing and fixing flush doors with decorative veneering		
9.22.1	On one side in item no. 9.21	Sqm	372.00
9.23	Extra for providing lipping with 2nd class teak wood battens	Sqm	351.00
9.24	Extra for providing vision panel not exceeding 0.1 sqm in all type of		
9.24.1	Rectangular or square.	Sqm	120.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.25	Extra if louvers (not exceeding 0.2 sqm) are provided in flush door shutters (overall area of door shutters to be measured).		
9.25.1	Decorative type door.	Sqm	295.00
9.26	Extra for cutting rebate in flush door shutters (Total area of the shutter tobe measured).	Sqm	79.00
9.27	Providing and fixing 35mm thick wire gauze shutters using galvanised M.S. wire gauze of average width of aperture 1.4mm with wire of dia. 0.63 mm for doors, windows and clerestory windows including ISI marked bright finished or/and black enamelled M.S. butt hinges with necessary screws :		
9.27.1	Second class teak wood.	Sqm	2557.00
9.27.2	Kiln seasoned and chemically treated Hollock wood.	sqm	1558.00
9.27.3	Labour rate for Item No.- 9.27.1, 9.27.2	Sqm	346.00
9.28	Providing and fixing 35mm thick wire gauze shutters using galvanised M.S. wire gauze of average width of aperture 1.4mm with wire of dia. 0.63 mm for doors, windows and clerestory windows including ISI marked stainless steel butt hinges with necessary screws :		
9.28.1	Second class teak wood.	Sqm	2654.00
9.28.2	Kiln seasoned and chemically treated Hollock wood.	Sqm	1655.00
9.28.3	Labour rate for Item No.- 9.28.1, 9.28.2	Sqm	346.00
9.29	Providing and fixing 30mm thick wire gauge shutters using galvanised M.S. wire gauge of average width of aperture 1.4mm with wire of dia. 0.63 mm for doors, windows and clerestory windows including ISI marked Stainless Steel butt hinges with necessary screws :		
9.29.1	Second class teak wood.	Sqm	2307.00
9.29.2	Kiln seasoned and chemically treated Hollock wood.	Sqm	1453.00
9.29.3	Labour rate for Item No.- 9.29.1, 9.29.2	Sqm	314.00
9.30	Providing and fixing 30mm thick wire gauze shutters using galvanised M.S. wire gauze of average width of aperture 1.4mm with wire of dia 0.63 mm for doors, windows and clerestory windows including ISI marked bright finished or /and black enamelled M.S. butt hinges with necessary screws :		
9.30.1	Second class teak wood.	Sqm	2245.00
9.30.2	Kiln seasoned and chemically treated Hollock wood.	Sqm	1391.00
9.30.3	Labour rate for Item No.- 9.30.1, 9.30.2	Sqm	321.00
9.31	Providing and fixing wire gauze laminated veneer lumber shutters conforming to IS : 14616, and as per TADS 15 :2001 (Part B) using galvanised wire gauze with average width of aperture 1.4mm in both directions with wire of dia 0.63mm as per IS :1568 for doors, windows and clerestory windows including ISI marked bright finished or/ and black enamelled M.S. butt hinges with necessary screws as per directions of Engineer-in-charge:		
9.31.1	35 mm thick shutters	Sqm	2064.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.31.2	30 mm thick shutters	Sqm	1780.00
9.31.3	Labour rate for Item No.- 9.31.1, 9.31.2	Sqm	115.00
9.32	Providing 50x50x50mm 2nd class teak wood plugs including cutting brick work and fixing in cement mortar 1:3 (1 cement : 3 fine sand) and making good the walls etc.	Each	15.00
9.32.1	Labour rate for Item No.- 9.32	Each	5.00
9.33	Providing and fixing expandable fasteners of specified size with necessary plastic sleeves and galvanised M.S. screws including drilling holes in masonry work /CC/ R.C.C. and making good etc. complete.		
9.33.1	25 mm long	Each	12.00
9.33.2	32 mm long	Each	15.00
9.33.3	40 mm long	Each	21.00
9.33.4	50 mm long	Each	26.00
9.33.5	Labour rate for Item No.- 9.33.1, 9.33.2, 9.33.3, 9.33.4	Each	3.00
9.34	Providing and fixing 2nd class teak wood plain lining, tongued and grooved on and including wooden plugs complete with necessary screws and priming coat on unexposed surface.		
9.34.1	40 mm thick	Sqm	4649.00
9.34.2	25 mm thick	Sqm	2875.00
9.34.3	20 mm thick	Sqm	2372.00
9.34.4	12 mm thkck	Sqm	1492.00
9.34.5	Labour rate for Item No.- 9.34.1 to 9.34.2	Sqm	115.00
9.34.6	Labour rate for Item No.- 9.34.3 to 9.34.4	Sqm	100.00
9.35	Providing and fixing in wall lining flat pressed three layer (medium density) particle board or graded wood Prelaminated one side decorative lamination, on other side balancing lamination Grade I, Type II, IS : 12823 marked including priming coat on unexposed surface, with necessary fixing arrangement and screws etc. complete :		
9.35.1	12 mm thick	Sqm	1026.00
9.35.2	18 mm thick	Sqm	1180.00
9.35.3	25 mm thick	Sqm	1269.00
9.35.4	Labour rate for Item No.- 9.35.1, 9.35.2, 9.35.3	Sqm	120.00
9.36	Providing and fixing specified wood frame work consisting of battens 50x25mm fixed with rawl plug and drilling necessary holes for rawl plug etc. including priming coat complete with following wood.		
9.36.1	Hollock wood.	Cum	77462.00
9.36.2	Labour rate for Item No.- 9.36.1	Cum	11594.00
9.37	Providing and fixing plywood 4 mm thick one side decorative veneer conforming to IS: 1328 (type-1) for plain lining / cladding with necessary screws, priming coat on unexposed surface with:		
9.37.1	Decorative veneer facings of approved manufacture	Sqm	708.00
9.37.2	Labour rate for Item No.- 9.37.1	Sqm	190.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.38	Providing and fixing 4mm thick coir veneer board, ISI marked IS : 14842 - 2000, plain lining with necessary screws, priming coat on unexposed surface etc., complete.	Sqm	691.00
9.38.1	Labour rate for Item No.- 9.38	Sqm	190.00
9.39	Providing and fixing skirting of Pre-laminated with (one side decorative and other side balancing lamination) flat pressed, 3 layer or graded particle board (medium density) Grade I, Type II, IS :12823 marked, with necessary fixing arrangements and screws including drilling necessary holes for rawl plugs etc. and priming coat on unexposed surface complete:		
9.39.1	18 mm thick	Sqm	1347.00
9.39.2	25 mm thick	Sqm	1437.00
9.39.3	Labour rate for Item No.- 9.39.1, 9.39.2	Sqm	56.00
9.40	Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete:		
9.40.1	2nd class teak wood		
9.40.1.1	50x12 mm	meter	84.00
9.40.1.2	50 x 20 mm	meter	121.00
9.40.1.3	Labour rate for Item No.- 9.40.1.1, 9.40.1.2	meter	23.00
9.40.2	Hollock wood		
9.40.2.1	50x12 mm	meter	55.00
9.40.2.2	50 x 20 mm	meter	74.00
9.40.2.3	Labour rate for Item No.- 9.40.2.1, 9.40.2.2	meter	23.00
9.41	Providing and fixing plain jaffri of 35x10 mm laths placed 35 mm apart (frames to be paid separately) including fixing 50x12 mm beading complete with:		
9.41.1	Second class teak wood	Sqm	1461.00
9.41.2	Labour rate for Item No.- 9.41.1	Sqm	243.00
9.42	Providing and fixing 18 mm thick, 150 mm wide pelmet of flat pressed 3 layer or graded wood particle board medium density grade I, IS : 3087 marked including top cover of 6 mm commercial ply wood conforming to IS: 303 BWR grade, nickel plated M.S. pipe 20 mm dia (heavy type) curtain rod with nickel plated brackets including fixing with 25x3 mm M.S. flat 10 cm long and rawl plugs 50 mm long (designation 10 no.) etc all complete	meter	282.00
9.42.1	Labour rate for Item No.- 9.42	Meter	51.00
9.43	Providing and fixing 18 mm thick, 150 mm wide pelmet of coir veneer board ISI marked IS : 14842 - 2000, including top cover of 6 mm coir veneer board, nickle plated M.S. Pipe 20 mm dia. (heavy type) curtain rod with nickel plated brackets including fixing with 25x3 mm M.S. Flat 10 cm long and rawl plug 50 mm long (designation 10 No.) etc., all complete	meter	380.00
9.43.1	Labour rate for Item No.- 9.43	Meter	51.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.44	Extra for using veneered particle board conforming to IS 3097 Grade I, in item of pelmet 18mm thick 150mm wide.		
9.44.1	Non decorative veneer on both sides.	meter	24.00
9.44.2	Particle board with decorative veneering on both sides.	meter	81.00
9.45	Providing and fixing teak wood lipping of size 25x3 mm in pelmet.	meter	32.00
9.45.1	Labour rate for Item No.- 9.45	meter	10.00
9.46	Providing and fixing curtain rods of 1.25 mm thick chromium plated brass plate, with two chromium plated brass brackets fixed with C.P. brass screws and wooden plugs, etc., wherever necessary complete :		
9.46.1	12mm dia (18 gauge)	meter	238.00
9.46.2	20 mm dia (18 gauge)	meter	319.00
9.46.3	25 mm dia (18 gauge)	meter	412.00
9.46.4	Labour rate for Item No.- 9.46.1, 9.46.2, 9.46.3	meter	3.00
9.47	Providing and fixing nickel plated M.S. pipe curtain rods with nickel plated brackets :		
9.47.1	20 mm dia (heavy type)	meter	106.00
9.47.2	25 mm dia (heavy type)	meter	124.00
9.47.3	Labour rate for Item No.- 9.47.1, 9.47.2	meter	3.00
9.48	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. all complete.		
9.48.1	Fixed to steel windows by welding.	Kg	80.00
9.48.2	Fixed to openings /wooden frames with rawl plugs screws etc.	Kg	87.00
9.48.3	Labour rate for Item No.- 9.48.1 to 9.48.2	Kg	22.00
9.49	Providing and fixing expanded metal 20x60mm strands 3.25mm wide and 1.6mm thick for windows etc. including 62x19mm beading of IInd class teak wood.	Sqm	771.00
9.49.1	Labour rate for Item No.- 9.49	Sqm	78.00
9.50	Providing and fixing hard drawn steel wire fabric 75x25 mm mesh of weight not less than 7.75 Kg per sqm to window frames etc. including 62x19 mm beading of second class teak wood.	Sqm	995.00
9.50.1	Labour rate for Item No.- 9.50	Sqm	78.00
9.51	Providing and fixing fly proof galvanised M.S. wire gauze to windows and clerestory windows using galvanised M.S. wire gage with average width of aperture 1.4 mm in both directions with wire of dia. 0.63 mm.		
9.51.1	With 2nd class teak wood beading 62X19 mm.	Sqm	714.00
9.51.2	With 12 mm mild steel U beading.	Sqm	430.00
9.51.3	Labour rate for Item No.- 9.51.1 to 9.51.2	Sqm	78.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.52	Deduct for fixing 75x25mm hard drawn steel wire fabric of weight not less than 7.75Kg. per sqm in panelled and glazed door and window shutter instead of glass sheet 4mm thick including the difference cost of material.	Sqm	163.00
9.53	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embeddings in cement concrete M-10 (Nominal Mix with 20 mm maximum size of stone aggregate) block 30x10x15 cm.	Each	79.00
9.53.1	Labour rate for Item No.- 9.53	Each	19.00
9.54	Providing beams including hoisting, fixing in position and applying wood preservative for the unexposed surfaces, etc. complete with :		
9.54.1	Other then teak wood.	Cum	62409.00
9.54.2	Hollock wood.	Cum	39903.00
9.54.3	Labour rate for Item No.- 9.54.1 to 9.54.2	Cum	2874.00
9.55	Providing and fixing ISI marked M.S. pressed butt hinges bright finished with necessary screws etc. complete :		
9.55.1	125x65x2.12 mm	Each	26.00
9.55.2	100x58x1.90 mm	Each	19.00
9.55.3	75x47x1.70 mm	Each	15.00
9.55.4	50x37x1.50 mm	Each	9.00
9.55.5	Labour rate for Item No.- 9.55.1 to 9.55.4	Each	5.00
9.56	Providing and fixing IS : 1341 marked M.S. heavy weight butt hinges with necessary screws etc. complete :		
9.56.1	125x90x4.00 mm	Each	48.00
9.56.2	100x75x3.50 mm	Each	34.00
9.56.3	75x60x3.10 mm	Each	17.00
9.56.4	50x40x2.50 mm	each	11.00
9.56.5	Labour rate for Item No.- 9.56.1 to 9.56.4	Each	5.00
9.57	Providing and fixing ISI marked oxidised M.S. pressed butt hinges with necessary screws etc. complete.		
9.57.1	125x65x2.12 mm	Each	22.00
9.57.2	100x58x1.90 mm	Each	16.00
9.57.3	75x47x1.70 mm	Each	12.00
9.57.4	50x37x1.50 mm	Each	6.00
9.57.5	Labour rate for Item No.- 9.57.1 to 9.57.4	Each	5.00
9.58	Providing and fixing ISI marked oxidised M.S. pressed Parliamentary hinges with necessary screws etc. complete		
9.58.1	150x125x27x2.50 mm	Each	52.00
9.58.2	125x125x27x2.50 mm	Each	43.00
9.58.3	100x125x27x2.50 mm	Each	36.00
9.58.4	75x100x20x2.24 mm	Each	32.00
9.58.5	Labour rate for Item No.- 9.58.1, 9.58.2, 9.58.3, 9.58.4	Each	6.00
9.59	Providing and fixing ISI marked oxidised M.S. single acting spring hinges with necessary screws etc. complete		

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.59.1	150 mm	Each	127.00
9.59.2	125 mm	Each	115.00
9.59.3	100 mm	Each	88.00
9.59.4	Labour rate for Item No.- 9.59.1, 9.59.2, 9.59.3	Each	12.00
9.60	Providing and fixing oxidised M.S. double acting spring hinges with necessary screws etc. complete.		
9.60.1	150 mm	Each	120.00
9.60.2	125 mm	Each	106.00
9.60.3	100 mm	Each	77.00
9.60.4	Labour rate for Item No.- 9.60.1, 9.60.2, 9.60.3	Each	12.00
9.61	Providing M.S. Piano hinges ISI marked IS : 3818 finished with nickel plating and fixing with necessary screws etc. complete.		
9.61.1	Overall width 35 mm.	meter	98.00
9.61.2	Overall width 50 mm.	meter	96.00
9.61.3	Overall width 65 mm.	meter	103.00
9.61.4	Labour rate for Item No.- 9.61.1, 9.61.2, 9.61.3	meter	48.00
9.62	Providing and fixing ISI marked oxidised M.S. sliding door bolts with nuts and screws etc. complete :		
9.62.1	300x16 mm	Each	105.00
9.62.2	250x16 mm	Each	94.00
9.62.3	Labour rate for Item No.- 9.62.1, 9.62.2	Each	5.00
9.63	Providing and fixing ISI marked oxidised M.S. tower bolt black finish, (Barrel type) with necessary screws etc. complete :		
9.63.1	250x10 mm	Each	58.00
9.63.2	200x10 mm	Each	43.00
9.63.3	150x10 mm	Each	31.00
9.63.4	100x10 mm	Each	24.00
9.63.5	Labour rate for Item No.- 9.63.1, 9.63.2, 9.63.3, 9.63.4	Each	2.00
9.64	Providing and fixing ISI marked 85x42mm oxidised M.S. pull bolt lock conforming to IS : 7534 with necessary screws bolts, nut and washers etc. complete.	Each	63.00
9.64.1	Labour rate for Item No.- 9.64	Each	5.00
9.65	Providing and fixing ISI marked oxidised M.S. door latches conforming to IS:5930 with screws etc. complete :		
9.65.1	300x20x6 mm	Each	57.00
9.65.2	250x20x6 mm	Each	53.00
9.65.3	Labour rate for Item No.- 9.65.1, 9.65.2	Each	3.00
9.66	Providing and fixing ISI marked oxidised M.S. handles conforming to IS:4992 with necessary screws etc. complete :		
9.66.1	125 mm	Each	18.00
9.66.2	100 mm	Each	12.00
9.66.3	75mm	Each	9.00
9.66.4	Labour rate for Item No.- 9.66.1, 9.66.2, 9.66.3	Each	1.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.67	Providing and fixing oxidised Mild Steel hasp and staple (safety type) conforming to IS : 363 with necessary screws etc. complete :		
9.67.1	150mm	Each	15.00
9.67.2	115mm	Each	14.00
9.67.3	90mm	Each	11.00
9.67.4	Labour rate for Item No.- 9.67.1, 9.67.2, 9.67.3	Each	2.00
9.68	Providing and fixing oxidised M.S. casement stays (straight peg type) with necessary screws etc. complete.		
9.68.1	300 mm weighing not less than 200 gms.	Each	42.00
9.68.2	250 mm weighing not less than 150 gms.	Each	35.00
9.68.3	200 mm weighing not less than 120 gms.	Each	32.00
9.68.4	Labour rate for Item No.- 9.68.1, 9.68.2, 9.68.3	Each	2.00
9.69	Providing and fixing oxidised M.S. Safety chain with necessary fixtures for doors. (Weighting not less than 450 gms.)	Each	100.00
9.69.1	Labour rate for Item No.- 9.69	Each	2.00
9.70	Providing and fixing IS : 12817 marked stainless steel butt hinges with stainless steel screws etc. complete :		
9.70.1	125x64x1.90 mm	Each	55.00
9.70.2	100X58X1.90 mm	Each	48.00
9.70.3	75x47x1.80 mm	Each	32.00
9.70.4	50x37x1.50 mm	Each	21.00
9.70.5	Labour rate for Item No.- 9.70.1 to 9.70.4	Each	5.00
9.71	Providing and fixing IS : 12817 marked stainless steel butt hinges (heavy weight) with stainless steel screws etc. complete :		
9.71.1	125x64x2.50 mm	Each	64.00
9.71.2	100x60x2.50 mm	Each	50.00
9.71.3	75x50x2.50 mm	Each	37.00
9.71.4	Labour rate for Item No.- 9.71.1 to 9.71.3	Each	4.00
9.72	Providing and fixing bright finished brass butt hinges with necessary screws etc. complete :		
9.72.1	125x85x5.5 mm (heavy type)	Each	405.00
9.72.2	125x70x4 mm (ordinary type)	Each	124.00
9.72.3	100x85x5.5 mm (heavy type)	Each	361.00
9.72.4	100x70x4 mm (ordinary type)	Each	80.00
9.72.5	75x65x4 mm (heavy type)	Each	115.00
9.72.6	75x40x2.5 mm (ordinary type)	Each	38.00
9.72.7	50x40x2.5 mm (ordinary type)	Each	25.00
9.72.8	Labour rate for Item No.- 9.72.1 to 9.72.7	Each	5.00
9.73	Providing and fixing bright finished brass parliamentary hinges with necessary screws etc. complete :		
9.73.1	150x125x27x5 mm	Each	362.00
9.73.2	125x125x27x5 mm	Each	336.00
9.73.3	100x125x27x5 mm	Each	298.00
9.73.4	75x100x20x3.2 mm	Each	256.00
9.73.5	Labour rate for Item No.- 9.73.1 to 9.73.4	Each	6.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.74	Providing and fixing bright finished brass tower bolts (barrel type) with necessary screws etc. complete :		
9.74.1	250x10 mm	Each	245.00
9.74.2	200x10 mm	Each	191.00
9.74.3	150x10 mm	Each	140.00
9.74.4	100x10 mm	Each	125.00
9.74.5	Labour rate for Item No.- 9.74.1 to 9.74.4	Each	2.00
9.75	Providing and fixing bright finished brass door latch with necessary screws etc. complete :		
9.75.1	300x16x5 mm	Each	191.00
9.75.2	250x16x5 mm	Each	166.00
9.75.3	Labour rate for Item No.- 9.75.1, 9.75.2	Each	3.00
9.76	Providing and fixing bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles with necessary screws etc. complete (best make of approved quality).	Each	401.00
9.76.1	Labour rate for Item No.- 9.76	Each	37.00
9.77	Providing and fixing bright finished brass 100 mm mortice latch with one dead bolt and a pair of lever handles with necessary screws etc. complete (best make of approved quality).	Each	371.00
9.77.1	Labour rate for Item No.- 9.77	Each	37.00
9.78	Providing and fixing bright finished brass night latch including necessary screws etc. complete (best make of approved quality).	Each	808.00
9.78.1	Labour rate for Item No.- 9.78	Each	37.00
9.79	Providing and fixing special quality bright finished brass cupboard or ward robe locks with four levers including necessary screws etc. complete (best make of approved quality) :		
9.79.1	40mm	Each	143.00
9.79.2	50mm	Each	163.00
9.79.3	65mm	Each	175.00
9.79.4	75mm	Each	188.00
9.79.5	Labour rate for Item No.- 9.79.1 to 9.79.4	Each	37.00
9.80	Providing and fixing 50 mm bright finished brass cup board or wardrobe knob with necessary screws (best make of approved quality)	Each	54.00
9.80.1	Labour rate for Item No.- 9.80	Each	3.00
9.81	Providing and fixing bright finished brass handles with screws etc. complete :		
9.81.1	125 mm	Each	153.00
9.81.2	100 mm	Each	133.00
9.81.3	75mm	Each	108.00
9.81.4	Labour rate for Item No.- 9.81.1 to 9.81.3	Each	1.00
9.82	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	Each	124.00
9.82.1	Labour rate for Item No.- 9.82	Each	1.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.83	Providing and fixing IS : 3564 marked Aluminium die cast body tubular type universal hydraulic door closer with necessary accessories and screws etc. complete.	Each	795.00
9.83.1	Labour rate for Item No.- 9.83	Each	21.00
9.84	Providing and fixing IS : 3564 marked aluminium extruded section body tubular type universal hydraulic door closer with double speed adjustment with necessary accessories and screws etc. complete.	Each	1103.00
9.84.1	Labour rate for Item No.- 9.84	Each	21.00
9.85	Providing and fixing bright finished brass casement window fastener with necessary screws etc. complete.	Each	55.00
9.85.1	Labour rate for Item No.- 9.85	Each	2.00
9.86	Providing and fixing bright finished brass casement stays (straight peg type) with necessary screws etc. complete :		
9.86.1	300 mm weighing not less than 330 gms	Each	128.00
9.86.2	250 mm weighing not less than 280 gms	Each	116.00
9.86.3	200 mm weighing not less than 240 gms	Each	104.00
9.86.4	Labour rate for Item No.- 9.86.1 to 9.86.3	Each	2.00
9.87	Providing and fixing bright finished brass hasp and staple (safety type) with necessary screws etc. complete:		
9.87.1	150 mm	Each	121.00
9.87.2	115 mm	Each	99.00
9.87.3	90 mm	Each	81.00
9.87.4	Labour rate for Item No.- 9.87.1 to 9.87.3	Each	2.00
9.88	Providing and fixing chromium plated brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles with necessary screws etc. complete (best make of approved quality).	Each	667.00
9.88.1	Labour rate for Item No.- 9.88	Each	37.00
9.89	Providing and fixing chromium plated brass night latch including necessary screws etc. complete (Best make of approved quality).	Each	622.00
9.89.1	Labour rate for Item No.- 9.89	Each	41.00
9.90	Providing and fixing special quality chromium plated brass cupboard locks with six levers including necessary screws etc. complete (Best make of approved quality) of :		
9.90.1	Size 40 mm	Each	145.00
9.90.2	Size 50 mm	Each	152.00
9.90.3	Size 65 mm	Each	175.00
9.90.4	Size 75 mm	Each	198.00
9.90.5	Labour rate for Item No.- 9.90.1 to 9.90.4	Each	37.00
9.91	Providing and fixing chromium plated brass 50 mm cupboard or wardrobe knobs with nuts complete.	Each	48.00
9.91.1	Labour rate for Item No.- 9.91	Each	3.00
9.92	Providing and fixing chromium plated brass handles with necessary screws etc. complete:		

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.92.1	125 mm	Each	212.00
9.92.2	100 mm	Each	170.00
9.92.3	75 mm	Each	119.00
9.92.4	Labour rate for Item No.- 9.92.1 to 9.92.3	Each	1.00
9.93	Providing and fixing chromium plated brass casement window fastener with necessary screws etc. complete.	Each	84.00
9.93.1	Labour rate for Item No.- 9.93	Each	2.00
9.94	Providing and fixing chromium plated brass casement stays (straight peg type) with necessary screws etc. complete :		
9.94.1	300 mm weighing not less than 330 gms	Each	212.00
9.94.2	250 mm weighing not less than 280 gms	Each	197.00
9.94.3	200 mm weighing not less than 240 gms	Each	161.00
9.94.4	Labour rate for Item No.- 9.94.1 to 9.94.3	Each	2.00
9.95	Providing and fixing ISI marked aluminium butt hinges ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade with necessary screws etc. complete:		
9.95.1	125x75x4 mm	Each	99.00
9.95.2	125x63x4 mm	Each	94.00
9.95.3	100x75x4 mm	Each	81.00
9.95.4	100x63x4 mm	Each	77.00
9.95.5	100x63x3.2 mm	Each	73.00
9.95.6	75x63x4 mm	Each	51.00
9.95.7	75x63x3.2 mm	Each	46.00
9.95.8	75x45x3.2 mm	Each	29.00
9.95.9	Labour rate for Item No.- 9.95.1 to 9.95.8	Each	5.00
9.96	Providing and fixing aluminium sliding door bolts ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade with nuts and screws etc. complete :		
9.96.1	300x16 mm	Each	196.00
9.96.2	250x16 mm	Each	165.00
9.96.3	Labour rate for Item No.- 9.96.1 to 9.96.2	Each	11.00
9.97	Providing and fixing aluminium tower bolts ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade with necessary screws etc. complete :		
9.97.1	300x10 mm	Each	90.00
9.97.2	250x10 mm	Each	76.00
9.97.3	200x10 mm	Each	67.00
9.97.4	150x10 mm	Each	57.00
9.97.5	100x10 mm	Each	40.00
9.97.6	Labour rate for Item No.- 9.97.1 to 9.97.5	Each	17.00
9.98	Providing and fixing aluminium pull bolt lock anodised ISI marked (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws bolts, nut and washers etc. complete.	Each	83.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.98.1	Labour rate for Item No.- 9.98	Each	5.00
9.99	Providing and fixing 50cm long aluminium kicking plate 100x3.15 mm anodised (anodic coating not less than grade AC 10 as per IS :1868) transparent or dyed to required colour or shade with necessary screws etc. complete.	Each	140.00
9.99.1	Labour rate for Item No.- 9.99	Each	3.00
9.100	Providing and fixing aluminium handles ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade with necessary screws etc. complete :		
9.100.1	125 mm	Each	59.00
9.100.2	100 mm	Each	44.00
9.100.3	75 mm	Each	36.00
9.100.4	Labour rate for Item No.- 9.100.1 to 9.100.3	Each	1.00
9.101	Providing and fixing aluminium hanging floor door stopper ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws etc. complete.		
9.101.1	Single rubber stopper	Each	24.00
9.101.2	Twin rubber stopper	Each	65.00
9.101.3	Labour rate for Item No.- 9.101.1 to 9.101.2	Each	1.00
9.102	Providing and fixing aluminium casement stays ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws etc. complete.	Each	91.00
9.102.1	Labour rate for Item No.- 9.102	Each	2.00
9.103	Providing and fixing bright finished brass 100 mm mortice latch and lock ISI marked with six levers and a pair of anodised (anodic coating not less than grade AC 10 as per IS : 1868) aluminium lever handles with necessary screws etc. complete (Best make of approved quality).	Each	735.00
9.103.1	Labour rate for Item No.- 9.103	Each	37.00
9.104	Providing and fixing aluminium tee channels (heavy duty) with rollers, stop end in pelmets as curtain rod.	meter	76.00
9.104.1	Labour rate for Item No.- 9.104	meter	2.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.105	Providing and fixing partition upto ceiling height consisting of G.I. frame and required board including providing and fixing of frame work made of special section power pressed/roll form G.I.sheet with zinc coating of grade 175 in consisting of floor and ceiling channel 50mm wide having equal flanges of 32mm and 0.5mm thick fixed to the floor and ceiling at the spacing of 610mm centre to centre with dash fastener of 12.5mm dia meter 40mm length and the studs 48mm wide having one flange of 34mm and other flange 36mm and 0.50mm 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 pacing of 450mm centre to centre and fixing of boards to either side of frame work by 20mm long drive wall screws on studs, floor and ceiling channels at the spacing of 300mm centre to centre, including jointing and finishing to a flush finish with recommended jointing compound, jointing tape joint finisher and two coats of primer suitable for board all complete.		
9.105.1	67mm overall thickness partition with 8.5mm thick double skin glass reinforced Gypsum (GRG) board conforming to IS: 2095: part III.	Sqm	1495.00
9.105.2	75mm overall thickness partition with 12.5mm thick double skin plain Gypsum board conforming to IS: 2095: part I	Sqm	931.00
9.105.3	66mm overall thickness Partition with 8mm thick double skin Calcium Silicate Board made with Calcareous & Siliceous materials reinforced with cellulose fiber manufactured through autoclaving process with Compressive Strength 225 kg/sq.cm, Bending Strength 100 kg/ sg.cm.	Sqm	1179.00
9.105.4	66mm overall thickness partition using 8mm thick double skin non-asbestos multipurpose cement board reinforced with cellulose fibre manufactured through autoclaving process (High pressure steam cured) as per IS: 14862 with suitable fibre cement screw.	Sqm	1291.00
9.105.5	Labour rate for Item No.- 9.105.1 to 9.105.4	Sqm	174.00
9.106	Providing and fixing PTMT handles with necessary screws etc. complete.		
9.106.1	125x34x24 mm weighing not less than 23 gms.	Each	40.00
9.106.2	150x34x24 mm weighing not less than 26 gms.	Each	44.00
9.106.3	Labour rate for Item No.- 9.106.1, 9.106.2	Each	1.00
9.107	Providing and fixing PTMT Butt hinges with necessary screws etc. complete.		
9.107.1	75x60x10 mm fitted with 5.5 mm dia M.S. Bright Bar Rod weighing not less than 34 gms.	Each	58.00
9.107.2	100x75x10 mm fitted with 5.5 mm dia MS Bright Bar Rod weighing not less than 53 gms.	Each	76.00
9.107.3	Labour rate for Item No.- 9.107.1, 9.107.2	Each	5.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.108	Providing and fixing PTMT Tower Bolts with 12 mm one piece rod inside and necessary screws etc., complete.		
9.108.1	152x42x18 mm weighing not less than 60 gms.	Each	88.00
9.108.2	202x42x18 mm weighing not less than 78 gms.	Each	106.00
9.108.3	Labour rate for Item No.- 9.108.1 to 9.108.2	Each	2.00
9.109	Providing and fixing PTMT door catcher of length 72 mm and dia. of 42 mm with suitable washers weighing not less than 33 gms.	Each	35.00
9.109.1	Labour rate for Item No.- 9.109	Each	1.00
9.110	Providing and fixing Bamboo jaffery/ fencing consisting of superior quality 25mm dia (Average) half cut bamboo placed vertically and fixed together with three numbers horizontal running members of hollock wood in scantling of section 50X25mm fixed with nails and G.I wire to existing surface complete as per direction of Engineer-in-charge.	Sqm	725.00
9.110.1	Labour rate for Item No.- 9.110	Sqm	49.00
9.111	Providing and fixing wooden moulded corner beading of triangular shape to the junction of panelling etc. with iron screws, plugs and priming coat on unexposed surface etc. complete 2nd class teak wood.		
9.111.1	50x50mm (base and height).	meter	151.00
9.111.2	Labour rate for Item No.- 9.111.1	meter	32.00
9.112	Providing and fixing 2nd class teak wood lipping/ moulded beading or taj beading of size 18X5mm fixed with wooden adhesive of approved quality and screws/ nails on the edges of the Pre-laminated particle board as per direction of Engineer-in-charge.	meter	38.00
9.112.1	Labour rate for Item No.- 9.112	meter	10.00
9.113	Providing and fixing bright finished 100mm mortice lock with 6 levers without pair of handles for aluminium door with necessary screws etc complete (Best make of approved quality) as per direction of Engineer-in- charge.	Each	242.00
9.113.1	Labour rate for Item No.- 9.113	Each	28.00
9.114	Providing and fixing magnetic catcher in cupboard / ward robe shutters including fixing with necessary screws etc. complete (Best make of approved quality).		
9.114.1	Triple strip vertical type.	Each	22.00
9.114.2	Double strip (horizontal type).	Each	19.00
9.114.3	Labour rate for Item No.- 9.114.1 to 9.114.2	Each	3.00
9.115	Providing and fixing powder coated telescopic drawer channels 300mm long with necessary screws etc. complete as per directions of Engineer-in-charge.	Each	162.00
9.115.1	Labour rate for Item No.- 9.115	Each	12.00
9.116	Providing and fixing sliding arrangement in racks/ cupboards/cabinets shutter by P/F stainless steel rollers to run inside C or E aluminium channel section (The payment of C or E channel shall be made separately)	Each	11.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.116.1	Labour rate for Item No.- 9.116	Each	1.00
9.117	Providing and fixing factory made UPVC door frame made of UPVC extruded section having an overall dimension as below (tolerance ±1mm) with wall thickness 2.0mm ± 0.2mm, corners of the door frame to be mitred and welded of plastic, galvanized brackets and stainless steel screws. The hinge side vertical of the frames reinforced by galvanized M.S. tube of size 19 X 19mm and 1mm ± 0.1mm wall thickness and 3 nos. stainless steel hinges fixed to the frame complete as per manufacturers specification and direction of Engineer-in-charge		
9.117.1	Extruded section profile size 48x40 mm.	meter	183.00
9.117.2	Extruded section profile size 42x50 mm.	meter	195.00
9.117.3	Labour rate for Item No.- 9.117.1 to 9.117.2	meter	12.00
9.118	Providing and fixing to existing door frames.		
9.118.1	24 mm thick factory made PVC door shutters made of styles and rails of a UPVC hollow section of size 59x24 mm and wall thickness 2 mm ± 0.2 mm with inbuilt edging on both sides.The styles and rails mitred and joined at the corners by means of M.S. galvanised/plastic brackets of size 75x220 mm having wall thickness 1.0mm and stainless steel screws.The styles of the shutter reinforced by inserting galvanised M.S. tube of size 20x20 mm and 1 mm ± 0.1 mm wall thickness.The lock rail made up of 'H' section, a UPVC hollow section of size 100x24 mm and 2 mm ± 0.2 mm wall thickness fixed to the shutter styles by means of plastic/galvanised M.S. 'U' cleats. The shutter frame filled with a UPVC multi-chambered single panel of size not less than 620 mm, having over all thickness of 20 mm and 1 mm ± 0.1 mm wall thickness. The panels filled vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers,complete as per manufacturer's specification and direction of Engineer-in- charge. (For W.C. and bathroom door shutter).	Sqm	2629.00
9.118.2	30 mm thick factory made Polyvinyl Chloride (PVC) door shutter made of styles and rails of a UPVC hollow section of size 60x30 mm and wall thickness 2 mm ± 0.2 mm with inbuilt decorative moulding edging on one side. The styles and rails mitred and joined at the corners by means of M.S. galvanised/plastic brackets of size 75x220 mm having wall thickness 1.0 mm and stainless steel screws. The styles of the shutter reinforced by inserting galvanised M.S. tube of size 25x20 mm and 1 mm ± 0.1 mm wall thickness. The lock rail made up of 'H' section, a UPVC hollow section of size 100x30 mm and 2 mm ± 0.2 mm wall thickness fixed to the shutter styles by means of plastic/ galvanised M.S. 'U' cleats. The shutter frame filled with a UPVC multi-chambered single panel of size not less than 620 mm,	Sqm	2726.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
	having over all thickness of 20 mm and 1 mm ± 0.1 mm wall thickness . The panels filled vertically and tie bar at two places by inserting horizontally 6 mm galvanised M.S. rod and fastened with nuts and washers, complete as per manufacturer's specification and direction of Engineer-in-charge.		
9.118.3	25mm thick PVC flush door shutters made out of a one piece Multi chamber extruded PVC section of the size of 762mm X 25mm or less as per requirement with an average wall thickness of 1mm ± 0.3mm. PVC foam end cap of size 23x10mm are provided on both vertical edges to ensure the overall thickness of 25mm. An M.S. tube having dimensions 19mm x 19mm is inserted along the hinge side of the door. Core of the door shutter should be filled with High Density Polyurethane foam. The Top & Bottom edges of the shutter are covered with an end-cap of the size 25MM X 11MM. Door shutter shall be reinforced with special polymeric reinforcements as per manufactures' specification and direction of Engineer-in-charge to take up necessary hardware and fixtures. Stickers indicating the locations of hardware will be pasted at appropriate places	Sqm	2831.00
9.118.4	Labour rate for Item No.- 9.118.1 to 9.118.3	Sqm	69.00
9.119	Providing and fixing factory made P.V.C. door frame of size 50x47mm with a wall thickness of 5mm, made out of extruded 5mm rigid PVC foam sheet mitred at corners and joined with 2 Nos. of 150mm long brackets of 15x15mm M.S. square tube, the vertical door profiles to be reinforced with 19x19mm M.S. square tube of 19 gauge, EPDM rubber gasket weather seal to be provided through out the frame. The door frame to be fixed to the wall using M.S. screws of 65/100mm size complete as per manufacturers specification and direction of ngineer-in-Charge.	meter	423.00
9.119.1	Labour rate for Item No.- 9.119	meter	12.00
9.120	Providing and fixing to existing door frames.		

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.120.1	30mm thick factory made panel PVC door shutter consisting of frame made out of M.S. tubes of 19 gauge thickness and size of 19mm x 19mm for styles and 15x15mm for top & bottom rails. M.S. frame shall have a coat of steel primers of approved make and manufacture M.S. frame covered with 5mm thick heat moulded PVC 'C' channel of size 30mm thickness, 70mm width out of which 50mm shall be flat and 20mm shall be tapered in 45degree angle on either side forming styles; and 5mm thick, 95mm wide PVC sheet out of which 75mm shall be flat and 20mm shall be tapered in 45 degree on the inner side to form top and bottom rail and 115mm wide PVC sheet out of which 75mm shall be flat and 20mm shall be tapered on both sides to form lock rail. Top, bottom and lock rails shall be provided either side of the panel. 10mm (5mm x 2) thick, 20mm wide cross PVC sheet be provided as gap insert for top rail & bottom rail.		
	paneling of 5mm thick both side PVC sheet to be fitted in the M.S. frame welded/ sealed to the styles & rails with 7mm (5mm+2mm) thick x 15mm wide PVC sheet beading on inner side, and joined together with solvent cement adhesive. An additional 5mm thick PVC strip of 20mm width is to be stuck on the interior side of the 'C' Channel using PVC solvent adhesive etc. complete as per direction of Engineer-in- charge. Manufacturer's specification & drawing (for W.C. and bathroom door shutter).	Sqm	2537.00
9.120.2	30mm thick factory made solid both side Pre-laminated panel PVC door shutter consisting of frame made out of M.S. tubes of 19 gauge thickness and size of 19mmx19mm for styles and 15x15mm for top & bottom rails. M.S. frame shall have a coat of steel primers of approved make and manufacture. M.S. frame covered with 5mm thick heat moulded Pre-laminated PVC 'C' channel of size 30mm thickness, 70mm width out of which 50mm shall be flat and 20mm shall be tapered in 45degree angle on either side forming styles; and 5mm thick, 95mm wide PVC sheet out of which 75mm shall be flat and 20mm shall be tapered in 45 degree on the inner side to form top and bottom rail and 115mm wide PVC sheet out of which 75mm shall be flat and 20mm shall be tapered on both sides to form lock rail. Top, bottom and lock rails shall be provided either side of the panel. 10mm (5mmx2) thick, 20mm wide cross PVC sheet be provided as gap insert for top rail & bottom rail. paneling of 5mm thick both side Pre-laminated PVC sheet to be fitted in the M.S.		
	frame welded/ sealed to the styles & rails with 7mm (5mm+2mm) thick x 15mm wide PVC sheet beading on inner side, and joined together with solvent cement adhesive. An additional 5mm thick PVC strip of 20mm width is to be stuck on the interior side of the 'C' Channel using PVC solvent adhesive etc. complete as per direction of Engineer-in-charge. Manufacturer's specification & drawing (for W.C. and bathroom door shutter).	Sqm	3239.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.120.3	Labour rate for Item No.- 9.120.1, 9.120.2	Sqm	80.00
9.121	Providing and fixing of Fiber Glass Reinforced plastic (FRP) Door Frames of three legged of cross-section 90mm x 45mm having single rebate of 32mm x 15mm to receive shutter of 30mm thickness .The laminate doorframe molded with fire resistant grade unsaturated polyester resin and chopped mat .Doorframe laminate shall be 2mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiberglass from all sides. M.S. stay shall be provided at the bottom to steady the frame.	meter	524.00
9.121.1	Labour rate for Item No.- 9.121	meter	12.00
9.122	Providing and fixing to existing door frames.		
9.122.1	30 mm thick Glass Fibre Reinforced Plastic (FRP) panelled door shutter of required colour and approved brand and manufacture, made with fire - retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5mm thick FRP laminate for panels and conforming to IS: 14856 - 2000 including fixing to frames	Sqm	2513.00
9.122.2	30mm thick fiberglass reinforced plastic (F.R.P.) flush door shutter in different plain and wood finish made with fire retardant grade unsaturated polyester resin, moulded to 3mm thick FRP laminate all around, with suitable wooden blocks inside at required places for fixing of fittings and polyurethane foam (PUF) / Polystyrene foam to be used as filler material throughout the hollow panel, casted monolithically with testing parameters of F.R.P. laminate conforming to table - 3 of IS: 14856 : 2000, complete as per direction of Engineer-in-charge.	Sqm	3096.00
9.122.3	Labour rate for Item No.- 9.122.1 to 9.122.2	Sqm	69.00
9.123	Providing and fixing factory made door frame (single rebate) made of solid PVC foam profile with homogenous fine cellular structure having smooth outer integral skin having 60mm width & 30mm thickness and shall be fixed to wall as per instructions of engineer-in-charge using 100x8 sheet metal CSK screws.	meter	339.00
9.123.1	Labour rate for Item No.- 9.123	meter	12.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.124	Providing and fixing 28 mm thick door shutter made of solid PVC foam profile with homogenous fine cellular structure having smooth outer integral skin having 71mm width & 28mm thick as styles and rails. Joints are made using solvent adhesive and GI 'C' sections (39mm x 19mm x 0.6mm thick) or M S pipe (40mm x 20mm) stiffener frame insert & telescopic polymeric 'L' corners .The panel shall be filled with 3mm thick high - pressure compact laminate as per manufacturer's specifications and direction of Engineer-in-charge, cover moulding shall be provided for covering fixing screws and elegant look.(for W.C. and bathroom door shutter).	Sqm	2986.00
9.124.1	Labour rate for Item No.- 9.124	Sqm	69.00
9.125	Providing and fixing PVC rigid foam sheet 1mm thick on existing door shutters (bathroom and W.C. doors) using synthetic rubber based adhesive.	Sqm	509.00
9.125.1	Labour rate for Item No.- 9.125	Sqm	188.00
9.126	Providing and fixing 12mm thick panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25mm to 40mm thick.		
9.126.1	Marine plywood of lamination / painting quality and conforming to IS: 710	sqm	1448.00
9.126.2	Fire retardant plywood of lamination / painting quality conforming to IS: 5509.	Sqm	1362.00
9.126.3	Labour rate for Item No.- 9.126.1 to 9.126.2	Sqm	184.00
9.127	Providing & Fixing decorative high pressure laminated sheet of plain / wood grain in gloss / matt / suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S including cost of adhesive of approved quality.		
9.127.1	1.5 mm thick	Sqm	733.00
9.127.2	1.0 mm thick	Sqm	617.00
9.127.3	Labour rate for Item No.- 9.127.1 to 9.127.2	Sqm	42.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.128	Providing and fixing factory made Fiberglass Reinforced plastics (F.R.P.) chajja 4mm thick of required colour, size and design made by Resin Transfer Moulding (RTM) Machine Technology, resulting in void free compact laminate in single piece, having smooth gradual slope curvature for easy drainage of water and duly reinforced by 2nos. vertically and 1nos. horizontally 50x2mm thick M.S. flat with 12mm in built hole for grouting on the existing wall along with the 50mm flanges duly inserted and sealed in the wall complete in one single piece casted monolithically, including all necessary fittings . The FRP Chajja should be manufactured using unsaturated Polyester resin as per IS: 6746 duly reinforced with fibre glass chopped strand mat (CSM) as per IS: 11551 complete with protective Gel coat U/V coating on Top for complete resistance from the extreme of temperature, weather & sunlight.	Sqm	5373.00
9.128.1	Labour rate for Item No.- 9.128	Sqm	323.00
9.129	Providing and fixing cup board shutters 25mm thick, with Pre-laminated flat pressed three layer particle board or graded wood particle board IS: 12823 marked exterior grade (Grade l Type ll) having one side decorative lamination and other side balancing lamination including IInd class teak wood lipping of 25mm wide x12 mm thick with necessary screws and bright finished stainless steel piano hinges complete as per direction of the Engineer-in-Charge	Sqm	1350.00
9.129.1	Labour rate for Item No.- 9.129	Sqm	102.00
9.130	Providing and fixing cup board shutters with 25mm thick veneered particle board IS : 3097 marked exterior grade (Grade I) of approved make including IInd class teak wood lipping of 25mm wide x 12 mm thick with necessary screws and bright finished stainless steel piano hinges complete as per direction of Engineer-in-Charge.		
9.130.1	With decorative veneering on one side and commercial veering on other side.	Sqm	1170.00
9.130.2	With non decorative veneering on both sides.	Sqm	1047.00
9.130.3	Labour rate for Item No.- 9.130.1, 9.130.2	Sqm	102.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
9.131	Providing and fixing factory made Pre-laminated particle board flat pressed three layer or graded wood particle board with one side decorative finish and other side balancing lamination conforming to IS: 12823 Grade I Type II, of approved design, and edges sealed with water resistant paint and lipped with aluminium 'U' type edge beading all-round the shutter, including fixing with angle cleat, grip strip, cadmium plated steel screws including fixing of aluminium hinges 100x63x4 mm etc. complete as per architectural drawing and direction of Engineer-in-Charge (Cost of 'U' beading and hinges will be paid for separately).		
9.131.1	25 mm thick	Sqm	1137.00
9.131.2	Labour rate for Item No.- 9.13.1	Sqm	56.00
9.132	Providing and fixing aluminum U beading of required size to Pre- laminated /flush door shutter including fixing etc. complete as per direction of Engineer-in-charge.	Kg.	399.00
9.132.1	Labour rate for Item No.- 9.132	Kg.	16.00
9.133	Providing and fixing, in position concealed G.I. section for wall paneling using board of required thickness fixed on the 'W' profile (0.55mm thick) having a knurled web of 51.55mm and two flanges of 26mm each with lips of 10.55 mm placed @ 610mm C/C in perimeter channel having one flange of 20mm and another flange of 30mm with thickness of 0.55mm and web of length 27mm. Perimeter channel is fixed on the floor and the ceiling with the nylon sleeves @ 610mm C/C with fully threaded self- tapping drywall screws. Board is fixed to the 'W' profile with 25 mm countersunk ribbed head screws @ 200mm C/C., all complete as per the drawing & directions of engineer-in-charge the joints of the boards are finished with specially formulated jointing compound and 48mm wide jointing tape to provide seamless finish.		
9.133.1	Tapered edge calcium silicate board made with calcareous & siliceous materials reinforced with cellulose fiber manufactured through autoclaving process to give stable crystalline structure with compressive strength 225 kg/sq.cm, Bending strength 100 kg/sq.cm.		
9.133.1.1	10mm thick.	Sqm	811.00
9.133.2	Non -asbestos multipurpose cement board reinforced with cellulose fibre manufactured through autoclaving process (high pressure steam cured) as per IS 14862 with suitable fibre cement screw.		
9.133.2.1	8 mm thick	Sqm	714.00
9.133.3	Gypsum board conforming to IS: 2095 - 1996: Part - I .		
9.133.3.1	12.5 mm thick	Sqm	516.00
9.133.4	Labour rate for Item No.- 9.133.1 to 9.133.3.1	Sqm	157.00

10.0 STEEL WORK

Notes for Specifications :-

1 Structural steel shall be of tested, standard quality conforming to IS: 226-69 & commercial quality shall conform to IS: 1977-69.

2 Steel work in single section are for works, like hold fasts & iron work for wooden trusses, M.S. Square/round guard bars fixed in wooden or steel windows & ventilators frames etc.

3 Steel work riveted or bolted shall conform to IS: 1148-1968 and IS : 800-1962.

4 Welding of steel shall be electric arc welding as per IS : 816-1956 and shall be on the lines given in IS : 800-1962.

5 Rolling shutters should conform to IS : 6248-1971.

6 Rolled steel sections for fabrication of steel glazed doors, windows & ventilators shall conform to IS : 7452-1974.

7 Glass panes should conform to IS : 1761-1960.

8 Screws shall conform to IS : 4218 (Part I to V I) 1967.

9 Steel doors, windows & ventilators shall conform to IS : 1038-1975 and IS : 7452-1974.

10 The rates of steel doors, windows & ventilators include cost of all materials, labour, T&P, hire & running charges of machineries & wastages etc. and also include cost of welding, all fixtures, erecting and fixing the sections in position.

11 Rates of steel angle iron fencing include all forging, reducing to required size, shape & figure, drilling, tapping, punching, counter sinking for screws, nailing etc. and every description of workmanship that may be necessary to fabricate, finish, erect and fix in positions in perfect manner.

12 Cold rolled framed profiles of pressed steel made from commercial M.S. Sheets conforming IS-513 of 1973 and as per general specifications of IS : 4351 are to be filled with M-15 grade of concrete and rates of items with these sections are inclusive of the cost of concrete.

Measurement of steel work in single section fixed independently with connecting plate:-

The work as fixed in place shall be measured in running meters correct to a millimeter and weights calculated on the basis of standard tables correct to nearest kilogram. The standard weight of steel sections shall conform to IS 808 with tolerances in sizes as per IS 1852.

Febricated work :-

The weight of finished section door/windows of different sizes, inclusive of all fixed /welded fittings i.e. hinges pivots, lugs, brackets striking plates etc., shall be worked out before fixing of windows (exclusive of wieght of glass panes, glazing clips, putty etc.). Sectional weight of steel members only shall be measured without weight of glass panes etc. Any loose fittings such as casement stays/fastners etc. shall be enumerated and paid for separately.

T-iron door windows and ventilator frames shall be measured in running meter, along the centre line of the frame correct to a 1mm and weight calculated on the basis of standard tables. No deduction or extra payment shall be made for making holes and making arrangement for fixing fittings including packing wherever necessary. No deduction will be made for not providing tie bars in case of windows and ventilators.

MANDATORY TESTS FOR STEEL WORK

Material	Test	Field/ Laboratory Test	Test Procedure	Minimum quantity of material/ work for carrying out the test	Frequency of testing
Steel if arranged by the contractor	(a) Tensile strength (b) Bend test	Laboratory	IS 1599	20 tonne	Every 20 tonne or part thereof.
Steel tubular pipes	(a) Tensile Test	Laboratory	IS 1608	Every 8 tonne or part thereof	Every 8 tonne or part thereof
	(b) Bend Test		IS 2329		
	(c) Flattening Test		IS 2328		

(For Detail Refer UADD Steel Work specification / CPWD specification)

10.0 STEEL WORK

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.1	Structural steel work in single section fixed with or without connecting plate including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	Kg	59.00
10.2	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete:	Kg.	62.00
10.2.1	Labour Charges	kg	7.00
10.3	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2 mm and braced with flat iron diagonals 20x5mm size with top and bottom rail of T-iron 40x40x6 mm with 40mm dia, steel pulleys complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	Sqm	3356.00
10.3.1	labour rate for Item No.- 10.3	Sqm	1399.00
10.4	Providing and fixing 1mm thick M.S. sheet sliding-shutters with frame and diagonal braces of 40x40x6mm angle iron, 3mm M.S. gusset plates at the junction and corners 25mm dia pulley, 40x40x6mm angle and T-iron guide at the top and bottom respectively including applying a priming coat of approved steel primer.	Sqm	2643.00
10.4.1	Labour rate for Item No.- 10.4	Sqm	478.00
10.5	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6mm angle iron and 3mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer.		
10.5.1	Using M.S. angels 40x40x6 mm for diagonal braces.	Sqm	2177.00
10.5.2	Using flats 30x6mm for diagonal braces and central cross piece.	Sqm	2041.00
10.5.3	Labour rate for Item No.- 10.5.1, 10.5.2	Sqm	585.00
10.6	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths interlocked together through their entire length and jointed together at the end by end locks mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete including the cost of providing and fixing necessary 27.5cm long wire springs grade No.2 and M.S. top cover of required thickness for rolling shutters.		
10.6.1	80x1.25mm M.S. laths with 1.25 mm thick top cover.	Sqm	1919.00
10.6.2	80x1.20 mm M.S. laths with 1.20 mm thick top cover.	Sqm	1395.00
10.6.3	80x0.90 mm M.S. laths with 0.90 mm thick top cover.	Sqm	1288.00
10.6.4	Labour rate for item No.- 10.6.1, 10.6.2, 10.6.3	Sqm	149.00
10.7	Providing and fixing ball bearing for rolling shutters.	Each	595.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.7.1	Labour rate for Item No.- 10.7	Each	33.00
10.8	Extra for providing mechanical device chain and crank operation for operating rolling shutters.		
10.8.1	Exceeding 10.00 sqm and upto 16.80 sqm in the area.	Sqm	599.00
10.8.2	Exceeding 16.80 sqm in area.	Sqm	672.00
10.9	Extra for providing grilled rolling shutters manufactured out of 8 mm dia. M.S. bar instead of laths as per design approved by Engineer-in-charge.(area of grill to be measured).	Sqm	268.00
10.10	Fixing standard steel glazed doors, windows and ventilators in walls with 15x3mm lugs 10 cm long embedded in cement concrete M-10 (Nominal Mix with 20mm maximum size of stone aggregate) blocks 15x10x10cm 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 float 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 clips or metal beading with screws, shall be supplied by department free of cost.)	Kg	27.00
10.11	Providing and fixing factory made ISI marked steel glazed doors, windows and ventilators side /top /centre hung with beading and all members such as K11 B and K12 B etc. complete of standard rolled steel sections, joints mitred and flash butt welded and sash bars tenoned and riveted with 15x3mm lugs, 10cm long, embedded in cement concrete M-10 (Nominal Mix with 20mm maximum size of stone aggregate) blocks 15x10x10cm 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 hinges, pivots, and a priming coat of approved steel primer excluding the cost of metal beading and other fittings except necessary hinges or pivots complete as per approved design. Excluding the cost of float glass panes with glazing clip and fixing of float glass panes.	Kg.	198.00
10.11.1	Labour rate for Item No.- 10.11	Kg.	31.00
10.12	Extra for providing and fixing steel beading of approved shape and section with screw instead of glazing clips and metal sash putty in steel doors, windows, ventilators and composite units.	meter	27.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.13	Providing and fixing T-iron frames for doors, windows and ventilators of mild steel Tee-sections, joints mitred and welded with 15x3 mm lugs 10cm long embedded in cement concrete M-10 (Nominal Mix with 20mm maximum size of stone aggregate) blocks 15x10x10 cm or with wooden plugs and screws or rawl plugs and screws or with dash fastener or with fixing clips or with bolts and nuts as require including fixing of necessary butt hinges and screws and applying a priming coat of approved steel primer.	Kg.	69.00
10.13.1	Labour rate for Item No.- 10.13	Kg.	5.00
10.14	Providing and fixing pressed steel frames for doors, windows & ventilators confirming to IS: 4351manufactured from commercial mild steel sheet of 1.25 mm thickness including hinges jamb, lock jamb, bead and if required angle threshold of mild steel angle of section 50x25mm, or base ties of 1.25mm pressed mild steel welded or rigidly fixed together by mechanical means, adjustable lugs with split end tail to each jamb including steel butt hinges 2.5mm thick with mortar guards, lock strike- plate and shock absorbers as specified and applying a coat of approved steel primer after pre-treatment of the surface as directed by Engineer-in-charge:		
10.14.1	Single rebate 80x50mm	Meter	302.00
10.14.2	Single rebate 100x50mm	Meter	334.00
10.14.3	Single rebate 1150x50mm	Meter	371.00
10.14.4	Labour rate for Item No.- 10.14.1, 10.14.2, 10.14.3	Meter	15.00
10.14.5	Providing and fixing pressed steel doors, windows and ventilators confirming to IS: 4351 manufactured from commercial mild steel sheet of 3.15mm thickness and applying a coat of approved steel primer after pre-treatment of the surface as directed by Engineer-in-charge:	Sqm	1473.00
10.15	Providing and fixing M.S. Tubular frames for doors, windows, ventilators and cupboard with L-Type section made of 1.60mm thick M.S. Sheet, joints mitred and welded and grinded finish profiles required size with 15x3mm lugs 10cm long embedded in cement concrete M-10 (Nominal Mix with 20mm maximum size of stone aggregate) blocks 15x10x10cm 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 necessary butt hinges and screws and applying a priming coat of approved steel primers.	Kg.	112.00
10.15.1	Labour rate for Item No.- 10.15	Kg.	5.00
10.16	Steel work in built up tubular trusses including cutting, hoisting fixing in position and applying a priming coat of approved steel primer, welded and bolted including special shaped washers etc. complete.		
10.16.1	Hot finished welded type tubes.	Kg.	83.00
10.16.2	Hot finished seamless type tubes.	Kg.	86.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.16.3	Electric resistance or induction butt welded tubes.	Kg.	96.00
10.16.4	Labour rate for Item No.- 10.16.1, 10.16.2, 10.16.3	Kg.	13.00
10.17	Providing and fixing M.S. fan clamp type I or II of 16 mm dia M.S. bar bent to shape with hooked ends in R.C.C. slabs, beams during laying including painting the exposed portion of loop, all as per standard design complete.	Each	104.00
10.17.1	Labour rate for Item No.- 10.17	Each	16.00
10.18	Providing and fixing circular/ Hexagonal cast iron or M.S. sheet box for ceiling fan clamp of internal dia 140mm, 73mm height, top lid of 1.5mm thick M.S. sheet with its top surface hacked for proper bonding, top lid shall be screwed into the cast iron/ M.S. sheet box by means of 3.3mm dia. round headed screws, one lock at the corners. Clamp shall be made of 12mm dia M.S. bar bent to shape as per standard drawing.	Each	105.00
10.18.1	Labour rate for Item No.- 10.18	Each	12.00
10.19	Providing and fixing M.S. round holding down bolts with nuts and washer plates complete.	Kg.	64.00
10.19.1	Labour rate for Item No.- 10.19	Kg.	5.00
10.20	Providing and fixing bolts including nuts and washers complete.	Kg.	79.00
10.20.1	Labour rate for Item No.- 10.20	Kg.	16.00
10.21	Providing and fixing M.S. rivets of sizes in position.	Kg.	85.00
10.21.1	Labour rate for Item No.- 10.21	Kg	35.00
10.22	Welding by gas or electric plant including transportation of plant at site etc. complete.	Cm	3.00
10.23	Providing and fixing bright finished brass casement window fasteners or peg stays to windows/ ventilators with necessary welding and machine screws etc. complete.	Kg.	322.00
10.23.1	Labour rate for Item No.- 10.23	Kg.	79.00
10.24	Providing and fixing 14 mm bright finished brass spring catch to steel centre hung ventilators with necessary welding and machine screws etc. complete.	Each	31.00
10.24.1	Labour rate for Item No.- 10.24	Each	16.00
10.25	Steel work welded in built up sections/ framed work including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.		
10.25.1	In stringers, treads, landings etc. of stair cases including use of chequered plate wherever required, all complete.	Kg.	63.00
10.25.1.1	Labour rate for Item No.- 10.25.1	Kg.	1.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.25.2	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works.	Kg.	67.00
10.25.2.1	Labour rate for Item No.- 10.25.2	Kg.	14.00
10.26	Providing and fixing hand rail of approved size by welding etc. to steel ladder railing, balcony railing and staircase railing including applying a priming coat of approved steel primer.		
10.26.1	M.S. tube.	Kg	84.00
10.26.2	E.R.W. tubes.	Kg	99.00
10.26.3	G.I. pipes.	Kg	76.00
10.26.4	Labour rate for Item No.- 10.26.1, 10.26.2, 10.26.3	Kg	18.00
10.27	Supplying at site :		
10.27.1	R.C.C. Standards post /struts /rails/ pales of mix grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) with 1.88 meter long 6mm dia 4 no. bar & 9 no. rings 6mm dia bar and wooden plugs or 6mm bar nibs wherever required as per direction of Engineer-in-charge including fixing (cost of earth works in excavation,concrete works in foundation to be paid separately)	Cum	14638.73
10.27(a).1	Labour rate for Item No.- 10.27.1	Cum	1510.00
10.27.2	Welded steel wire fabric of required width rectangular mesh painted with two or more coats of enamel paint of approved shade over a coat of primer (Painting to be paid for separately).	Kg	67.51
10.28	Supplying and fixing turn buckles and straining bolts for barbed wire fencing.	Each	111.00
10.28.1	Labour rate for Item No.- 10.28	Each	24.00
10.29	Fencing including with R.C.C. post , provided with nine horizontal rows and two diagonals rows of barbed wire 9.38 kg per 100 meter (min) between the two posts fitted and fixed with G.I. staples on wooden plugs or G.I. binding wire tied to 6 mm bar nibs fixed while casting the post. Payment to be made per meter cost of total length of barbed wire used. (RCC Post, earthwork & mortar shall be paid for separately).		
10.29.1	With G.I. barbed wire	Meter	8.00
10.29.2	Labour rate for Item No. 10.29.1	Meter	2.00
10.29.3	RCC post 2mtr. Height	Each	270.00
10.29.4	RCC post 2.3mtr. Height	Each	300.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.30	G.I Barbed wire Fencing 1.2 meter high (Providing and fixing 1.2 meters high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 meters center to center founded in M15 grade cement concrete, 0.6 meter below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per relevant clauses of section-800 of specifications. (Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.)		
10.30.1	With G.I. barbed wire	Meter	225.00
10.30.2	Labour rate for Item No. 10.30.1	Meter	16.00
10.30.3	Rate for angle iron post 40mmx40mmx6mm	Meter	50.00
10.30.4	Rate for Barbed wire @ 9.38 Kg per 100 meters (min.)	Meter	6.00
10.31	Supplying at site Angle iron post & strut of required size including bottom to be split and bent at right angle in opposite direction for 10 cm length and drilling holes upto 10 mm dia. etc. complete.	Kg.	60.00
10.32	Welded steel wire fabric fencing with posts of specified material and of standard design placed and embedded in cement concrete blocks 45x45x60cm of mix grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and struts embedded in cement concrete blocks 70x45x50cm of the same mix, provided with welded steel wire fabric fixed between the posts fitted and fixed with G.I. staples on wooden plugs or tied to 6 mm bar nibs with G.I. binding wire (cost of posts, welded steel wire fabric, painting, earth work in excavation and concrete to be paid for separately) :	Sqm	14.00
10.33	Providing and fixing concertina coil fencing with required dia 610 mm(having 15 nos. round per 6 meter length) up to 3m height of wall with existing angle iron 'Y' shaped placed 2.4 m or 3.00 m apart and with 9 horizontal R.B.T. stud tied with G.I. staples and G.I. clips to retain horizontal including necessary bolts or G.I. barbed wire tied to angle iron all complete as per direction of Engineer-in-charge with reinforced barbed tape(R.B.T.) / Spring core (2.5mm thick) wire of high tensile strength of 165 kg/ sq.mm with tape (0.52 mm thick) and weight 3.478gm/ meter (cost of M.S. angle, C.C. blocks shall be paid separately)	Meter	231.00
10.33.1	Labour rate for Item No. 10.33	Meter	14.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
10.34	Providing and fixing G.I. chain link fabric fencing of required width in mesh size 25x25 mm made of G.I. wire of dia. 3mm including strengthening with 3mm dia. wire or nuts, bolts and washers as required complete as per the direction of Engineer-in-charge.	Sqm	553.00
10.34.1	Labour rate for Item No. 10.34	Sqm	78.00
10.35	Providing and fixing G.I. chain link fabric fencing of required width in mesh size 50x50mm including strengthening with 4mm dia wire or nuts, bolts and washers as required complete as per the direction of Engineer-in-charge.	sqm	453.00
10.35.1	Labour rate for Item No.- 10.35	Sqm	97.00

11.00 FLOORING

Notes:

Applicable IS Code

IS 1124 Method of test for determination of water absortion, apparent specific gravity and porosity of natural building stones

IS 1130 Specification for marble (blocks, slabs and tiles)

IS1200-(Part XI) Method of measurement of Building and Civil Engineering work (Part 11) paving, floor finishes, dado and skirting

IS 1237-Edition 2.3 Specification for cement concrete flooring tiles

IS 2114 Code of practice for laying in-situ terrazzo floor finish

IS 13630 (Part-1 to 15) Methods of Testing of ceramic tiles

IS 15622 Specification for pressed ceramic tile

1 Marble chips / terrazo floors, skirting and dados shall conform to IS : 2114-1962.

2 Marble powder used in mosaic/terrazo topping shall pass through IS : sieve No.30.

3 Pigments used in terrazo/marble chips shall be of permanent colour.

4 For the situ marble chips/terrazo flooring the first grinding shall be done with carborandom stones of 60 grit size, the second grinding with 80 grit size and the third grinding with 120 to 150 grit size and the fourth grinding with 320 to 400 grit size.

5 For the slab or tiles flooring, the joints in the tiles or slab shall be of 1.50mm thickness. The joints shall be filled with the cement grout of the same shade as the colour of slab or tile. The terrazo tiles shall conform to IS : 1237-1959.

6 The slab or tiled flooring shall be grinded with carborandom stone. The first grinding shall be with carborandom stones of 48 to 60 grit size and the second grinding with 120 grit and final grinding with 220 to 350 grit. In case of plain/coloured terrazo tiles, initial grinding with carborandom stones of 48 to 60 grit is not necessary.

7 In case of composite flooring with two or more types of stones and where single type of stone used is 90% or more in area, the entire area is to be paid at the rate of flooring with that type of stone and in case, where the area of single type of stone is less than 90%, the flooring done shall be measured separately and paid at the rate of flooring for each type of stone separately.

8 **MARBLE STONE**: Marble shall be hard, sound, dense and homogeneous in texture with crystalline texture. It shall be uniform in colour and free from stains, cracks, decays and weathering.

(i)	Makarana second quality	White marble having lighter shades/spots.
(ii)	Raj nagar plain	White marble with blue or grey shades.
(iii)	Agaria White katani	White marble with irregular blue and black spots.

PHYSICAL PROPERTIES OF MARBLE BLOCKS, SLABS AND TILES

S.No	Characteristics	Requirements	Method of Test
1	Moisture absorption after 24hours immersion in cold water.	Max. 0.40% by weight	IS : 1124-1974
2	Hardness	Min. - 3	Mhos scale
3	Specific gravity	Min. - 2.50	IS : 1122-1974.

9 CEMENT CONCRETE FLOORING

9.1 Base Concrete

Flooring shall be laid on base concrete where so provided. The base concrete shall be provided with the slopes required for the flooring. Flooring in verandah, Courtyard, kitchens & baths shall have slope ranging from 1 : 48 to 1 : 60 depending upon location and as decided by the Engineer-in-Charge. Floors in water closet portion shall have slope of 1:30 or as decided by the Engineer-in-Charge to drain off washing water. Further, necessary drop in flooring in bath, WC, kitchen near floor traps ranging from 6 mm to 10 mm will also be provided to avoid spread of water. Necessary margin to accommodate this drop shall be made in base concrete. Plinth masonry off set shall be depressed so as to allow the base concrete to rest on it.

The flooring shall be commenced preferably within 48 hours of the laying of base concrete. The surface of the base shall be roughened with steel wire brushes without disturbing the concrete. Immediately before laying the flooring, the base shall be wetted and a coat of cement slurry @ 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

If the cement concrete flooring is to be laid directly on the RCC slab, the top surface of RCC slab shall be cleaned and the laitance shall be removed and a coat of cement slurry @ 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

9.2 Thickness

The thickness of floor shall be as specified in the description of the item.

9.3 Laying

Panels : Flooring of specified thickness shall be laid in the pattern including the border as given in the drawings or as directed by the Engineer-in-Charge. The border panels shall not exceed 450 mm in width and the joints in the border shall be in line with panel joints. The panels shall be of uniform size and no dimension of a pane! shall exceed 2 m and the area of a panel shall not be more than 2 sqm. The joints of borders at corners shall be mitred for provision of strips.

9.4 Curing

Curing shall be commenced on the next day of plastering when the plaster has hardened sufficiently and shall be continued for a minimum period of 7 days.

9.5 Measurement

Length and breadth shall be measured before laying skirting, dado or wall plaster. No deduction shall be made nor extra paid for voids not exceeding 0.20 sqm. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 sqm.

The flooring done either with strips (in one operation) or without strips (in alternate panels) shall be treated as same and measured together

9.6 Rates

The rate shall include the cost of all materials and labour involved in all the operations described above including application of cement slurry on RCC slab or on base concrete including roughening and cleaning the surface but excluding the cost of strips which shall be paid separately under relevant item.

10 **TERRAZO TILES FLOORING**

Terrazo tiles shall generally conform to IS 1237-Edition 2.3. Unless otherwise specified, the tiles shall be supplied with initial grinding and grouting of wearing layer

The size of tiles shall be as given in Table Below or as shown in the drawings or as required by the Engineer-in-Charge. Half tiles for use with the full tiles shall be such as to make two half tiles when joined together, match with the dimensions of one full tile.

Length Nominal	*Breadth Nominal*	*Thickness not less than*
200 mm	200 mm	20 mm
250 mm	250 mm	22 mm
300 mm	300 mm	25 mm

10.1 **Laying of Terrazo tile :-**

(i) Base concrete or RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tiles shall be with cement mortar of specified proportion and in conformity with provisions in relevant para of chapter on 'Mortar'.

(ii) Cement mortar 1:4 (1 Cement : 4 coarse sand) bedding shall be used. Average thickness of the bedding mortar shall be 20 mm and the thickness at any place shall not be less than 10 mm.

(iii) Cement mortar bedding shall be spread, tamped and corrected to proper levels and allowed to harden for a day before the tiles are set. If cement mortar is laid in bedding the terrazo tiles, these shall be set immediately after laying the mortar. Over this bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 4.4 kg of cement per square meter over such an area as would accommodate about twenty tiles. Tiles shall be washed clean and shall be fixed in this grout one after another, each tile being gently tapped with a wooden mallet till it is properly bedded, and in level with the adjoining tiles. The joints shall be kept as thin as possible not exceeding 1 mm and in straight lines or to suit the required pattern. The joints shall be properly cleaned before filling with cement grout of matching colour.

10.2 **Curing, Polishing and Finishing**

The floor shall then be kept wet for a minimum period of 7 days. The surface shall thereafter be grounded evenly with machine fitted with coarse grade grit block (No. 60). Water shall be used profusely during grinding. After grinding the surface shall be thoroughly washed to remove all grinding mud, cleaned and mopped. It shall then be covered with a thin coat of grey or white cement, mixed with or without pigment to match the colour of the topping of the wearing surface in order to fill any pin hole that appear. The surface shall be again cured. The second grinding shall then be carried out with machine fitted with fine grade grit block (No. 120).

10.3 **Measurements**

(i) Terrazo tiles flooring with tiles manufactured from ordinary grey cement without pigment and coloured terrazo tile flooring shall be measured in length and breadth correct to a cm before laying separately. Terrazo tile flooring shall be measured as laid in square meter correct to two plains of decimal. For length and breadth dimensions correct to a cm before laying skirting, dado or wall plaster shall be taken. No deduction shall be made nor extra paid for voids not exceeding 0.20 sqm. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square meter. Nothing extra shall be paid for use of cut tiles nor for laying the floor at different levels in the same room or courtyard.

(ii) Terrazo tile flooring laid in floor borders and similar band shall be measured under the item of terrazo tile flooring. Nothing extra shall be paid in respect of these and similar bands formed of half size or multiplies of half size standard tiles or other uncut tiles.

(iii) Treads of stairs and steps paved with tiles without nosing, shall also be measured under flooring- Moulded nosing shall be paid in running meter except where otherwise stated, returned moulded ends and angles to mouldings shall be included in the description. Extra shall, however, be paid for such areas where the width of treads does not exceed 30 cm.

10.4 **Rate:-**

The rate shall include the cost of all materials and labour involved in all the operations described above. Where cement mortar bedding is used in place of lime mortar the rate will be adjusted accordingly.

11 **CHEQUERED TILE FLOORING**

(i) The tiles shall be of nominal sizes such as 20 x 20 cm, 25 x 25 cm and 30 x 30 cm or of standard sizes with equal sides. The size of tiles to be used shall be as shown in approved drawings or as required by the Engineer-in-Charge. The centre to centre distance of chequers shall not be less than 2.5 cm and not more than 5 cm.

(ii) The overall thickness of the tiles shall not be less than 30 mm. The grooves in the chequers shall be uniform and straight. The depth of the grooves shall not be less than 3 mm. The chequered tiles shall be cement tiles, or terrazo tiles as specified in the description of the item. The thickness of the upper layer, measured from the top of the chequers shall not be less than 6 mm.

The terrazo tiles shall be given the first grinding with machine before delivery to site.

(iii) Laying, curing, Polishing and Finishing shall be same as TERRAZO TILES FLOORING except that the polishing of the tiles and the chequer grooves, after laying, may be done by hand. Special care shall be taken to polish the grooves in such a manner as to get a uniform section and that their finish shall match with the finish of flat portion of the tiles. Cement concrete tiles normally do not require polishing but where polishing is required the same shall be done as described above.

11.1 **Measurements**

Chequred tiles on stair treads shall be measured in square meter correct to two places of decimal. Length shall be measured correct to a cm before laying skirting, dado or wall plaster. Width shall be measured correct to a cm from the outer edge of the nosing, as (aid, before providing the riser. In the case of the edge tiles of the landing and wide steps, width shall be measured upto the near edge of the chequered stair tread tiles. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square meter.

11.2 **Rates: -**

The rate shall include the cost of all materials and labour involved in all the operations described above.

Nothing extra shall be payable for cutting the tiles to suit the size of treads and also for nosing.

12 **PRESSED CERAMIC TILE FLOORING**

The tiles shall be of approved make and shall generally conform to IS 15622. They shall be flat, and true to shape and free from blisters crazing, chips, welts, crawling or other imperfections detracting from their appearance. The tiles shall be tested as per IS 13630.

Classification and Characteristics of pressed ceramic tiles shall be as per IS 13712.

The tiles shall be square or rectangular of nominal size. Table 1,3,5, and 7 of IS 15622 give the modular preferred sizes and table 2,4,6 and 8 give the most common non modular sizes. Thickness shall be specified by the manufacturer. It includes the profiles on the visible face and on the rear side. Allowable nominal joint width upto 2mm for unrectified floor tiles and upto 1mm for rectified floor tiles. The joint in case of spacer lug tile shall be as per spacer. The tiles shall conform to table 10 of IS 15622 with water absorption 3 to 6%.

The top surface of the tiles shall be glazed. Glaze shall be either glossy or matt as specified. The underside of the tiles shall not have glaze on more than 5% of the area in order that the tile may adhere properly to the base. The edges of the tiles shall be preferably free from glaze. However, any glaze if unavoidable, shall be permissible on only upto 50 % of the surface area of the edges.

12.1 **Coloured Tiles**

Only the glaze shall be coloured as specified. The sizes and specifications shall be the same as for the white glazed tiles.

12.2 **Decorative Tiles**

The type and size of the decorative tiles shall be as follows: -

(i) **Decorated white back ground tiles**

The size of these tiles shall be as per IS 15622.

(ii) **Decorated and having coloured back-ground**

The sizes of the tiles shall be as per IS 15622.

12.3 **Preparation of Surface and Laying**

(i) Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or as specified. The average thickness of the bedding shall be 20 mm or as specified while the thickness under any portion of the tiles shall not be less than 10 mm.

(ii) Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

(iii) Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of cement per square meter over an area upto one square meter. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

(iv) The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required slope. In bath, toilet W.C. kitchen and balcony/verandah flooring, suitable tile drop or as shown in drawing will be given in addition to required slope to avoid spread of water. Further tile drop will also be provided near floor trap.

(v) Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge rubbed smooth to ensure straight and true joints.

Tiles which are fixed in the floor adjoining the wall shall enter not less than 10 mm under the plaster, skirting or dado.

(vi) After tiles have been laid surplus cement slurry shall be cleaned off.

12.4 **Pointing and Finishing**

The joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. Where spacer lug tiles are provided, the half the depth of Joint shall be filled with polysulphide or as specified on top with under filling with cement grout without the lugs remaining exposed. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

12.5 **Measurements**

Length and breadth shall be measured correct to a cm before laying skirting, dado or wall plaster and the area calculated in square meter correct to two places of decimal. Where coves are used at the junctions, the length and breadth shall be measured between the lower edges of the coves.

No deduction shall be made nor extra paid for voids not exceeding 0.20 square meter. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square meter.

Areas, where glazed tiles or different types of decorative tiles are used will be measured separately.

12.6 **Rates**

The rate for flooring shall include the cost of all materials and labour involved in all the operations described above, For tiles of sizes upto 0.16 sqm, unless otherwise specified in the description of the item. Nothing extra shall be paid for the use of cut (sawn) tiles in the work.

Extra over and above the normal rate for white tiles shall be paid where coloured or any other type of decorative tiles have been used.

13 MARBLE STONE FLOORING

13.1 **Marble Stone**

It shall be as specified in para number 8.

13.2 **Dressing of Slabs**

Every stone shall be cut to the required size and shape, fine chisel dressed on all sides to the full depth so that a straight edge laid along the side of the stone shall be fully in contact with it. The top surface shall also be fine chisel dressed to remove all waviness. In case machine cut slabs are used, fine chiesel dressing of machine cut surface need not be done provided a straight edge laid any where along the machine cut surfaces is in contact with every point on it. The sides and top surface of slabs shall be machine rubbed or table rubbed with coarse sand before paving. All angles and edges of the marble slabs shall be true, square and free from chippings and the surface shall be true and plane.

The thickness of the slabs shall be 18, 30 or 40 mm as specified in the description of the item. Tolerance of + 3% shall be allowed for the thickness. In respect of length and breadth of slabs a tolerance of ± 2% shall be allowed.

13.3 **Laying of Mable stone**

(i) Base concrete or the RCC slab on which the slabs are to be laid shall be cleaned, wetted and, mopped. The bedding for the slabs shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or as given in the description of the item.

(ii) The average thickness of the bedding mortar under the slab shall be 20 mm and the thickness at any place under the slab shall be not less than 12 mm.

(iii) The slabs shall be laid in the following manner:

Mortar of the specified mix shall be spread under the area of each slab, roughly to the average thickness specified in the item. The slab shall be washed clean before laying, it shall be laid on top, pressed, tapped with wooden mallet and brought to level with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar is allowed to harden a bit and cement slurry of honey like consistency shall be spread over the same at the rate of 4.4 kg of cement per sqm. The edges of the slab already paved shall be buttered with grey or white cement with or without admixture of pigment to match the shade of the marble slabs as given in the description of the item.

(iv) The slab to be paved shall then be lowered gently back in position and tapped with wooden mallet till rt is properly bedded in level with and close to the adjoining slabs with as fine a joint as possible. Subsequent slabs shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off- The flooring shall be cured for a minimum period of seven days. The surface of the flooring as laid shall be true to levels, and, slopes as instructed by the Engineer-in-Charge. Joint thickness shall not be more than 1 mm.

(v) Due care shall be taken to match the grains of slabs which shall be selected Judiciously having uniform pattern of Veins/streaks or as directed by the Engineer-in-Charge.The slabs shall be matched as shown in drawings or as instructed by the Engineer-in-Charge.

(vi) Slabs which are fixed in the floor adjoining the wall shall enter not less than 12 mm under the plaster skirting or dado. The junction between waif plaster and floor shall be finished neatly and without waviness.

14 RED OR WHITE FINE DRESSED SAND STONE FLOORING

14.1 Red/White/Coloured Sand stone : The slabs of white, red and stones of other colours found at Shivpuri, Mandana, Jaisalmer, Dholpur, Basoda, Raisen and at other places to be used in flooring work shall be hard, durable and tough, free from cracks, decays and weathering. In case of red sand stones and other coloured sand stones, white patches or streaks and in case of white sand stones, coloured patches or streaks shall not be allowed. How ever, scattered spots upto 10mm diameter shall be permitted.

14.2 Dressing of Slabs

Every slab shall be cut to the required size and shape and chisel dressed on all sides to a minimum depth of 20 mm. The top and the Joints shall be fine tooled so that straight edge laid along the face is fully in contact with it. In case machine cut stones are used, chisel dressing and fine tooling of machine cut surface need not be done provided a straight edge laid anywhere along the machine cut surface is in contact with every point on it.

The thickness of the slabs after dressing shall be 40 mm or as specified in the description of item with a permissible tolerance of ± 2 mm.

14.3 Laying

(i) Base concrete on which the slabs are to be laid shall be cleaned, wetted and mopped. The bedding for the slabs shall be with cement mortar 1:5 (1 cement : 5 coarse sand) or as given in the description of the item.

(ii) The average thickness of the bedding mortar under the slabs shall be 20 mm and the thickness at any place under the slabs shall not be less than 12 mm.

(iii) The slab shall be laid in the following manner:

Mortar of specified mix shall be spreaded under each slab. The slab shall be washed clean before laying. It shall then be laid on top, pressed and larried, so that all hollows underneath get filled and surplus mortar works up through the joints. The top shall be tapped with a wooden mallet and brought to level and close to the adjoining slabs, with thickness of joint not exceeding 5 mm. Subsequent slabs shall be laid in the same manner. After laying each slab surplus mortar on the surface of slabs shall be cleaned off and joints finished flush.

(iv) In case pointing with other mortar mix is specified, the joint shall be left raked out uniformly and to a depth of not less than 12 mm when the mortar is still green. The pointing shall be cured for a minimum period of 7 days. The surface of the flooring as laid shall be true to levels and slopes as instructed by the Engineer-in-Charge.

15 RED OR WHITE FINE DRESSED AND RUBBED SAND STONE FLOORING

Stone Slabs shall be as specified in 14.1.

15.1 Dressing

The specifications for dressing the top surface and the sides shall be as described in para 14.2. In addition the dressed top and sides shall be table rubbed with coarse grade carborundum stone before paving, to obtain a perfectly true and smooth surface free from chisel marks.

The thickness of the slabs after dressing shall be as specified with a permissible tolerance of ± 2 mm.

15.2 Laying

The slabs shall be laid with 3 mm thick or 5 mm thick joints as specified in the description of the item.

Where the joints are to be limited to 3 mm thickness, the slabs shall be laid as method specified in Marble flooring except that the bedding mortar shall be as specified in para 10.3 and sides of the slabs to be jointed shall be buttered with cement mortar 1:2 (1 cement ; 2 stone dust) admixed with pigment to match the shade of the slab.

Where the slabs are to be laid with 5 mm thick joints, the specifications for laying shall be as described in para 14.3.

16 Kota stone flooring

Kota stone slabs/tiles shall be of selected quality, hard, sound, dense and homogeneous in texture, free from cracks, decay, weathering and flaws. They shall be hand or machine cut in requisite thickness. They shall be of the colour indicated in the approved drawings or as instructed by the Engineer-in-Charge.

The slabs shall have the top (exposed) face polished before being brought to site, unless otherwise specified. The slabs shall conform to the size required. Before starting the work the contractor shall get the samples of slabs approved by the Engineer-in-Charge.

16.1 Dressing

Every slab shall be cut to the required size and shape and fine chisel dressed on the sides to the full depth so that a straight edge laid along the side of the stone shall be in full contact with it. The sides (edges) shall be table rubbed with coarse sand or machine rubbed before paving. All angles and edges of the slabs shall be true, square and free from chippings and the surface shall be true and plane.

The thickness of the slab after it is dressed shall be 20, 25, 30 or 40 mm as specified in the description of the item. Tolerance of ±2 mm shall be allowed for the thickness. In respect of length and breadth of slabs Tolerance of ± 5 mm for hand cut slabs and ± 2 mm for machine cut stabs shall be allowed.

16.2 **Preparation of Surface and Laying**

The specification shall be same as marble laying except that the edges of the slabs to be jointed shall be buttered with grey cement, with admixture of pigment to match the shade of the slab. The thickness of the joints should be minimum as possible. In any location, it shall not exceed 1 mm.

16.3 **Polishing and Finishing**

The specifications shall be same as marble polishing and finishing except that
(a) first polishing with coarse grade carborundum stone shall not be done,
(b) cement slurry with or without pigment shall not be applied on the surface before polishing.

16.4 **Measurement & Rates: -**

Same as specified in marble flooring.

17 Tiles shall be used of premier class.

18 Engineer in charge shall inspect the cement concrete interlocking paver block in factory and approved the interlocking paver block before supply.

(For Detail Refer UADD Flooring specification / CPWD specification)

11. FLOORING			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
11.1	Brick on edge (Depth) flooring with bricks of class designation 40 including cement slurry etc. complete in cement mortar with chimney brick class designation 40.		
11.1.1	1:4 (1 cement : 4 coarse sand)	Sqm	591.00
11.1.2	1:6 (1cement : 6 coarse sand)	Sqm	555.00
11.1.3	Deduct from Item no.11.1.1 & 11.1.2 if open Bhatta bricks are used.	Sqm	66.00
11.1.4	Labour rate for Item No.- 11.1.1, 11.1.2	Sqm	66.00
11.2	Dry brick on edge flooring in required pattern with bricks of class designation 40 on a bed of 12 mm mud mortar including filling joints with Sand (with M.S. bricks) complete.	Sqm	473.00
11.2.1	Labour rate for Item No.- 11.2	Sqm	60.00
11.3	Cement concrete flooring M-15 (nominal mix) finished with a floating coat of neat cement including cement slurry, but excluding the cost of nosing of steps etc. complete.		
11.3.1	40mm thick with 20mm maximum size of stone aggregate.	Sqm	236.00
11.3.2	Labour rate for Item No. 11.3.1	Sqm	69.00
11.4	52 mm thick cement concrete flooring with concrete hardener topping under layer 40 mm thick cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) and top layer 12 mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix : 2 graded stone aggregate 6 mm nominal size) by volume .hardening compound is mixed @ 2 litre per 50 kg of cement or as per manufacturers specifications. This includes cost of cement slurry, but excluding the cost of nosing of steps etc. complete.	Sqm	347.00
11.4.1	Labour rate for Item No. 11.4	Sqm	121.00
11.5	62 mm thick cement concrete flooring with concrete hardener topping under layer 50 mm thick cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) and top layer 12mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix : 2 graded stone aggregate 6mm nominal size) by volume. Hardening compound is mixed @ 2 litre per 50kg of cement or as per manufactures specifications. This includes cost of cement slurry, but excluding the cost of nosing of steps etc. complete.	Sqm	387.00
11.5.1	Labour rate for Item No. 11.5	Sqm	126.00
11.6	Cement plaster skirting (up to 30 cm height) with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement.		
11.6.1	18 mm thick.	Sqm	216.00
11.6.2	Labour rate for Item No. 11.6.1	Sqm	88.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.7	Cement concrete pavement with grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) including finishing complete.	Cum	4455.00
11.7.1	Labour rate for Item No. 11.7	Cum	71.00
11.8	Extra for making chequers of approved pattern on cement concrete floors, steps, landing, pavements etc.	Sqm	16.00
11.9	40 mm thick marble chips flooring rubbed and polished to granolithic finish, under layer 34 mm thick cement concrete grade M-15 (Nominal Mix with 12.5mm maximum size of stone aggregate) and top layer 6mm thick with white, black, chocolate, grey, yellow or green marble chips of 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 including cement slurry etc. complete :		
11.9.1	Dark shade pigment with ordinary cement.	Sqm	376.00
11.9.2	Light shade pigment with white cement.	Sqm	414.00
11.9.3	Medium shade pigment with 50% white cement and 50% ordinary cement.	Sqm	397.00
11.9.4	White cement without any pigment.	Sqm	389.00
11.9.5	Light shade pigment with ordinary cement.	Sqm	379.00
11.9.6	Ordinary cement without any pigment.	Sqm	351.00
11.9.7	Labour rate for Item No. 11.9.1 to 11.9.5	Sqm	122.00
11.10	40 mm thick marble chips flooring, rubbed and polished to granolithic finish, under layer 31mm thick cement concrete grade M-15 (Nominal Mix with 12.5mm maximum size of stone aggregate) and top layer 9mm thick with white, black, chocolate, grey, yellow or green marble chips of sizes from 4mm to 7mm 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 : 7 marble chips) by volume including cement slurry etc. complete.		
11.10.1	Dark shade pigment with Ordinary cement.	Sqm	395.00
11.10.2	Light shade pigment with white cement.	Sqm	450.00
11.10.3	Medium shade pigment with 50% white cement and 50% ordinary cement.	Sqm	424.00
11.10.4	White cement without any pigment.	Sqm	414.00
11.10.5	Light shade pigment with ordinary cement.	Sqm	397.00
11.10.6	Ordinary cement without any pigment.	Sqm	411.00
11.10.7	Labour rate for Item No. 11.10.1 to 11.10.6	Sqm	122.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.11	40 mm thick marble chips flooring, rubbed and polished to granolithic finish, under layer 28 mm thick cement concrete M-15 (Nominal Mix with 12.5mm maximum size of stone aggregate) and top layer 12mm thick with white, black, chocolate, grey yellow or green marble chips of sizes from 7mm to 10mm nominal size laid in cement marble powder mix 3:1 (3 cement : 1 marble powder) by weight in proportion of 2:3 (2 cement marble powder mix : 3 marble chips) by volume including cement slurry etc. complete :		
11.11.1	Dark shade pigment with ordinary cement.	Sqm	494.00
11.11.2	Light shade pigment with white cement.	Sqm	571.00
11.11.3	Medium shade pigment with 50% white cement and 50% ordinary cement.	Sqm	535.00
11.11.4	White cement without any pigment.	Sqm	445.00
11.11.5	Light shade pigment with ordinary cement.	Sqm	499.00
11.11.6	Ordinary cement without any pigment.	Sqm	374.00
11.11.7	Labour rate for Item No. 11.11.1 to 11.11.6	Sqm	122.00
11.12	Marble chips skirting (up to 30 cm height) rubbed and polished to granolithic finish, top layer 6 mm thick with white, black, chocolate, grey, yellow or green marble chips of sizes from smallest to 4 mm 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 :		
11.12.1	18 mm thick with under layer 12 mm thick in cement plaster 1:3 (1 cement : 3 coarse sand) :		
11.12.1.1	Dark shade pigment with ordinary cement.	Sqm	465.00
11.12.1.2	Light shade pigment with white cement.	Sqm	503.00
11.12.1.3	Medium shade pigment with 50% white cement and 50% ordinary cement.	Sqm	485.00
11.12.1.4	White cement without any pigment.	Sqm	478.00
11.12.1.5	Light shade pigment with ordinary cement.	Sqm	468.00
11.12.1.6	Ordinary cement without any pigment.	Sqm	440.00
11.12.1.7	Labour rate for Item No. 11.12.1.1 to 11.12.1.6	Sqm	286.00
11.13	Providing and fixing glass strips in joints of terrazo/cement concrete floors.		
11.13.1	40 mm wide and 4 mm thick.	meter	22.00
11.14	Extra for laying terrazo flooring on staircase treads not exceeding 30 cm in width including cost of forming, nosing etc.	Sqm	18.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.15	Crazy marble stone flooring including filling the gaps with light shade pigment with white cement marble powder mixture (3 parts of white cement : 1 part of marble powder) by weight in proportion of 4:7 (4 cement marble powder mix : 7 white, black or white and black marble chips of sizes from 1mm to 4mm nominal size by volume) and under layer 25mm thick cement concrete M-15 (Nominal Mix with 12.5mm maximum size of stone aggregate) rubbing, polishing and cement slurry etc. complete :		
11.15.1	18 mm thick crazy marble stone white, black or as specified.	Sqm	581.00
11.15.2	Labour rate for Item No. 11.15.1	Sqm	210.00
11.16	Precast terrazo tiles 18-20mm thick with graded marble chips of size upto 12mm laid in floors, and landings, jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles on 20mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand)		
11.16.1	Light shade using white cement.	Sqm	739.00
11.16.2	Medium shade using 50%white cement and 50% ordinary cement.	Sqm	680.00
11.16.3	Dark shade using ordinary cement.	Sqm	648.00
11.16.4	Ordinary cement without any pigment.	Sqm	598.00
11.16.5	Labour rate for Item No. 11.16.1 to 11.16.4	Sqm	152.00
11.17	Extra if terrazo tiles are laid in treads of steps not exceeding 30 cm in	Sqm	22.00
11.18	Precast terrazo tiles 18-20mm thick with graded marble chips of sizes upto 12 mm in skirting and risers of steps not exceeding 30 cm in height on 12 mm thick cement plaster 1:3 (1 cement : 3 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of the tiles, including rubbing and polishing complete with tiles of :		
11.18.1	Light shade using white cement.	Sqm	876.00
11.18.2	Medium shade using 50%white cement and 50% ordinary cement.	Sqm	807.00
11.18.3	Dark shade using ordinary cement.	Sqm	764.00
11.18.4	Ordinary cement without any pigment.	Sqm	714.00
11.18.5	Labour rate for Item No. 11.18.1 to 11.18.4	Sqm	288.00
11.19	Chequered terrazo tiles 18-20mm thick with graded marble chips of size up to 6 mm in floors jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete on 20 mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand) :		
11.19.1	Light shade using white cement.	Sqm	797.00
11.19.2	Medium shade using 50%white cement and 50% Grey cement.	Sqm	725.00
11.19.3	Dark shade using ordinary cement.	Sqm	648.00
11.19.4	Ordinary cement without any pigment.	Sqm	598.00
11.19.5	Labour rate for Item No. 11.19.1 to 11.19.4	Sqm	115.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.20	Chequerred precast cement concrete tiles 18-20mm thick in footpath & courtyard jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and cleaning etc. complete on 20 mm thick bed of cement mortar 1:4 (1 cement: 4 coarse sand).		
11.20.1	Light shade using white cement.	Sqm	1103.00
11.20.2	Medium shade using 50%white cement and 50% Grey cement.	Sqm	840.00
11.20.3	Dark shade using ordinary cement.	Sqm	616.00
11.20.4	Ordinary cement without any pigment.	Sqm	565.00
11.20.5	Labour rate for Item No. 11.20.1 to 11.20.4	Sqm	94.00
11.21	Providing and fixing 10mm thick acid and or alkali resistant tiles of approved make and colour using acid and or alkali resisting mortar bedding and joints filled with acid and or alkali resisting cement as per IS : 4457 complete as per the direction of Engineer-in- Charge.		
11.21.1	In flooring on a bed of 10 mm thick mortar 1:4 (1 acid proof cement : 4 coarse sand).		
11.21.1.1	Acid and alkali resistant tile.	Sqm	1078.00
11.21.2	In dado/skirting on 12 mm thick mortar 1:4 (1 acid proof cement : 4 coarse sand).		
11.21.2.1	Acid and alkali resistant tile.	Sqm	1120.00
11.21.2.2	Labour rate for Item No. 11.21.1. to 11.21.2.1	Sqm	105.00
11.22	Tile work in skirting, risers of steps and dado (up to 2 m height) over 12 mm thick bed of cement mortar 1:3 (1 cement :3 coarse sand) and jointed with grey cement slurry @ 3.3 kg/sqm including pointing in white cement mixed with pigment of matching shade complete.		
11.22.1	Marble tiles (polished) Raj Nagar.		
11.22.1.1	8 mm thick	Sqm	650.00
11.22.1.2	Labour rate for Item No. 11.22.1.1	Sqm	107.00
11.23	Marble stone flooring with 16mm thick marble stone (sample of marble shall be approved by Engineer-in-charge of minimum size 0.45 sqm) over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry including rubbing and polishing complete with :		
11.23.1	Makrana white second quality.	Sqm	1415.00
11.23.2	Raj Nagar plain	Sqm	871.00
11.23.3	Agaria White	Sqm	1870.00
11.23.4	Black Zebra.	Sqm	1114.00
11.23.5	Udaipur green marble	Sqm	1114.00
11.23.6	Pink plain marble.	Sqm	1203.00
11.23.7	Labour rate for Item No. 11.23.1 to 11.23.6	Sqm	172.00
11.24	Extra for pre finished nosing to treads of steps of marble stone.	meter	131.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.25	Extra for marble stone flooring in treads of steps and risers using single length up to 2.00 meter .	Sqm	154.00
11.26	Kota stone slab 25mm thick flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar (1 cement : 4 course sand) 1 : 4 (minimum size of kota stone 0.25 sqm)	Sqm	819.00
11.26.1	Kota/cuddapah stone slab 30 mm thick flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar (1 cement : 4 course sand) 1 : 4 (minimum size of kota stone 0.25 sqm)	Sqm	899.00
11.26.2	Labour rate for Item No. 11.26 & 11.26.1	Sqm	167.00
11.27	Kota stone slabs 25mm thick in risers of steps, skirting,dado and pillars laid on 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 slabs, including rubbing and polishing complete.	Sqm	821.00
11.27.1	Labour rate for Item No. 11.27	Sqm	286.00
11.28	40 mm thick fine dressed stone flooring over 20 mm (average) thick base of cement mortar 1:5 (1cement : 5 coarse sand) with joints finished flush. (minimum size of kota stone 0.25 sqm)		
11.28.1	Red sand stone	Sqm	423.00
11.28.2	White sand stone	Sqm	442.00
11.28.3	Labour rate for Item No. 11.28.1 to 11.28.2	Sqm	106.00
11.29	40 mm thick fine dressed stone flooring over 20 mm (average) thick base of cement mortar 1:5 (1 cement : 5 coarse sand) including pointing with cement mortar 1:2 (1 cement : 2 stone dust) with an admixture of pigment to match the shade of stone. (minimum size of kota stone 0.25 sqm)		
11.29.1	Red sand stone	Sqm	477.00
11.29.2	White sand stone	Sqm	496.00
11.29.3	Labour rate for Item No. 11.29.1 to 11.29.2	Sqm	146.00
11.30	40 mm thick rubbed local Flag stone flooring over 20 mm (average) thick base of cement mortar 1:5 (1 cement :5 coarse sand) with joints 3mm thick, side buttered with cement mortar 1:2 (1 cement : 2 stone dust) admixed with pigment to match the shade of stone and pointing with same mortar (minimum size of kota stone 0.25 sqm)		
11.30.1	Red sand stone	Sqm	513.00
11.30.2	White sand stone	Sqm	532.00
11.30.3	Labour rate for Item No. 11.30.1 to 11.30.2	Sqm	163.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.31	Extra for pre finished nosing in treads of steps of Kota stone/ sand stone slab.	meter	32.00
11.32	Extra for Kota stone/ sand stone in treads of steps and risers using single length above 1.05 meter .	Sqm	8.00
11.33	Providing and fixing M.S. angle 50x50x5 mm to act as nosing with lugs of M.S. flat 10x5 mm 10cm long forked at end 60cm apart (minimum three lugs to be provided) including necessary welding and applying a priming coat of approved primer on exposed surface etc. complete.	Kg	65.00
11.33.1	Labour rate for Item No.- 11.33	Kg.	11.00
11.34	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS : 15622 (6 to 7mm thick) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge in skirting, risers of steps 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 pigment of matching shade complete.	Sqm	686.00
11.34.1	Labour rate for Item No. 11.34	Sqm	107.00
11.35	Providing and laying Ceramic glazed floor tiles 300x300 mm (9 to 10 mm thick) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick Cement Mortar 1:4 (1 Cement : 4 Coarse sand) including pointing the joints with white cement and matching pigment etc., complete.	Sqm	804.00
11.35.1	Labour rate for Item No. 11.35	Sqm	85.90
11.36	Providing and laying Ceramic glazed floor tiles 300x300 mm (9 to 10mm thick) of 1st quality conforming to IS : 15622 of approved make in all colours, shades, except White, Ivory, Grey, Fume Red Brown laid on 20mm thick bed of Cement Mortar 1:4 (1 Cement : 4 Coarse sand) including pointing the joints with white cement and matching pigments etc., complete.	Sqm	867.00
11.36.1	Labour rate for Item No. 11.36	Sqm	86.00
11.37	Providing and laying rectified Glazed Ceramic floor tiles 300x300 mm or more (8mm to 10mm thick) of 1st quality conforming to IS : 15622 of approved make in colours White, Ivory, Grey, Fume Red Brown, 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.	Sqm	951.90
11.37.1	Labour rate for Item No. 11.37	Sqm	90.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.38	Providing and laying rectified Glazed Ceramic floor tiles 300x300 mm or more (8mm to 10mm thick) of 1st quality conforming to IS : 15622 of approved make in all colours, shades, except White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick Cement Mortar 1:4 (1 Cement : 4 Coarse sand) including pointing the joints with white cement and matching pigments etc., complete.	Sqm	1003.00
11.38.1	Labour rate for Item No. 11.38	Sqm	86.00
11.39	Providing and laying polished vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption's less than 0.08% and conforming to IS : 15622 of approved make in all colours and shades, 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.		
11.39.1	Size of Tile 50x50 cm x 10 mm	Sqm	1041.00
11.39.2	Size of Tile 60x60 cm x 10 mm	Sqm	1109.00
11.39.3	Size of Tile 80x80 cm x 10 mm	Sqm	1566.00
11.39.4	Size of Tile 100x100 cm x 10 mm	Sqm	1834.00
11.39.5	Labour rate for Item No. 11.39.1 to 11.39.4	Sqm	88.00
11.40	Deduct for not using 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) bedding in laying of floor tiles.	Sqm	140.00
11.41	Fixing glazed/ Ceramic/ Vitrified floor tiles with cement based high polymer modified quick-set tile adhesive (Water based) conforming to IS: 15477 , using 5kg. adhesive per sqm of tile area, in average 3mm thickness with fixing material.	Sqm	268.00
11.41.1	Labour rate for Item No. 11.41	Sqm	84.00
11.42	Making bajri path including preparation of subgrade, supplying and laying brick aggregate of 50mm nominal size 7.5 cm deep with blinding material consisting of 12 mm moorum and 12 mm red bajri consolidated with road roller.	Sqm	224.00
11.42.1	Labour rate for Item No. 11.42	Sqm	14.00
11.43	Dry stone pitching 20 to 22.5cm thick including supply of stones and preparing surface complete.	Sqm	783.00
11.43.1	Labour rate for Item No. 11.43	Sqm	122.00
11.44	Dry brick pitching half brick thick in drains including supply of bricks and preparing the surface complete :		
11.44.1	With chimney bricks of class designation 40	Sqm	427.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.45	Providing and fixing at or near ground level factory made RCC pavement slab of M-30 grade of size 450x450x50mm (HPL or equivalent) including reinforcement with 6mm dia M.S. bars 4 nos on each side including setting in position in footpath to the required level and line over a bed of 20mm average thick cement mortar (1 cement : 3 coarse sand) having thickness not more than 5mm except on curve including filling of joints with same cement mortar and making grooves etc. complete as per direction of Engineer-in-charge.	Sqm	465.00
11.45.1	Labour rate for Item No. 11.45	Sqm	125.00
11.46	Providing and laying 60 mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine ith strong vibratory compaction and of approved size and design/shape laid in required colour and pattern over and including 50 mm thick compacted bed of course sand, filling the joints with coarse sand etc. all complete as per the direction of Engineer-in-charge.	Sqm	454.00
11.46.1	Providing and laying 80mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction and of approved size and design/ shape laid in required colour and pattern over and including 50mm thick compacted bed of course sand, filling the joints with coarse sand etc. all complete as per the direction of Engineer-in-charge.	Sqm	568.00
11.46.2	Providing and laying 100 mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction and of approved size and design/ shape laid in required colour and pattern over and including 50mm thick compacted bed of course sand, filling the joints with coarse sand etc. all complete as per the direction of Engineer-in-charge.	Sqm	678.00
11.46.3	Labour rate for Item No. 11.46 to 11.46.2	Sqm	64.00
11.47	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M-30 grade reflective type rubber modulded glossy colour paving block made by block making machine with strong vibratory compaction and of approved size and shape laid in required colour and pattern over and including 60mm thick compacted bed of stone dust filling the joints with sand etc. all complete as per the direction of Engineer in charge including locking edges wherever required wihing cement concrete M15 grade or cement mortor 1:3 with pigment of required shade to match the colour /shade of block including cost of labour, material , etc. all complete.	Sqm	570.00
11.48	Deduction from item No. 11.45, 11.46,11.46.1, 11.46.2 & 11.47, if factory made cement concrete interlocking paver blocks of M-25 grade are used.	Cum	65.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
11.48.1	Deduction from item No. 11.45, 11.46,11.46.1, 11.46.2 & 11.47, if factory made cement concrete interlocking paver blocks of M-20 grade are used.	Cum	99.00
11.49	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement in position to the required line, level and curvature jointed with cement mortar 1:3 (1 cement: 3 coarse sand) including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm) including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	Cum	5098.00
11.49.1	Labour rate for Item No. 11.49	Cum	254.00
11.50	Kota stone slabs 30 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (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 slabs, including rubbing and polishing complete.	Sqm	901.00
11.50.1	Labour rate for Item No. 11.50	sqn	286.00

12.00 ROOFING AND CEILING

Notes

Applicable IS Code

IS 277 Galvanised steel sheets (plain and corrugated)

IS1200(PT.IX) Method of measurements of building and civil engineering works: Part - 9 Roof covering (including cladding)

IS2095(PT-1) Gypsum plaster boards (Pt.1) plain Gypsum plaster boards

IS 2645 Specification for integral water proofing compounds for cement mortar and concrete

Type of Roofing

(i) Corrugated Galvanised Steel Roofing

(ii) Non Asbestos High Impact Poly Propylene Reinforced Cement Semi Corrugated Sheets Roofing

(iii) Red or White Sand Stone Roofing

1 **CGS (Corrugated Galvanised Steel) Sheet Roofing**

The G.S. sheet to be used in work shall conform to IS : 277-2003.

2 The C.G.S. sheets shall be free from cracks, split edges, twists, surface flaws etc. They shall be clean, bright and smooth. The galvanising shall be non-injured and in perfect condition. The sheets shall not show signs of rust or white powdry deposits on the surface. The corrugations shall be uniform in depth and pitch and parallel with the side.

3 **Purlins**

Purlins of the specified material or M.S. rolled sections of requisite size shall be fixed over the principal rafters. These shall not be spaced at more than the following distances.

Thickness of C.G.S. sheet	*Maximum spacing of purlins*
1.00 mm	2.00 metre
0.80 mm	1.80 metre
0.63 mm	1.60 metre

4 Roof shall not be pitched at a flatter slope than 1 vertical to 5 horizontal. The normal pitch adopted shall usually be 1 vertical to 3 horizontal.

5 Laying and fixing

(i) The sheets shall be laid with a minimum lap of 15 cm at the ends and 2 ridges of corrugations at each side. The above minimum end lap of 15 cm shall apply to slopes of 1 vertical to 2 horizontal and steeper slopes. For flatter slopes the minimum permissible end lap shall be 20 cm. The minimum lap of sheets with ridge, hip and valley shall be 20 cm measured at right angles to the line of the ridge, hip and valley respectively. These sheets shall be cut to suit the dimensions or shapes of the roof, either along their length or their width or in a slant across their lines of corrugations at hips and valleys. They shall be cut carefully with a straight edge chisel to give a smooth and straight finish.

(ii) Lapping in C.G.S. sheets shall be painted with a coat of approved steel primer and two coats of painting with approved paint suitable for G.S. sheet, before the sheets are fixed in place.

(iii) Sheets shall not generally be fixed into gables and parapets. They shall be bent up along their side edges close to the wall and the junction shall be protected by suitable flashing or by a projecting drip course, the later to cover the Junction by at least 7.5cm.

(iv) The laying operation shall include all scaffolding work involved.

(v) Sheets shall be fixed to the .purlins or other roof members such as hip or valley rafters etc. with galvanised J or L hook bolts and nuts, 8 mm diameter, with bitumen and G.I. limpet washers or with a limpet washer filled with white lead as directed by the Engineer-in-Charge. White J hooks are used for fixing sheets on angle iron purlins, and L hooks are used for fixing the sheet to R.S. joists, timber or precast concrete purlins. The length of the hook bolt shall be varied to suit the particular requirements.

The bolts shall be sufficiently long so that after fixing they project above the top of the nuts by not less than 10 mm. The grip of J or L hook bolt on the side of the purlin shall not be less than 25 mm. There shall be a minimum of three hook bolts placed at the ridges of corrugations in each sheet on every purlin and their spacing shall not exceed 30 cm. Coach screws shall not be used for fixing sheets to purlins.

6 GALVANISED STEEL SHEETS

6.1 Dimensions

Sizes of plain Sheet: The plain sheets shall be supplied in any combination of the following lengths, widths and thickness.

(a) Length : 2500 and 3000 mm

(b) Width: 900 and 1000mm

(c) Thickness : 0.50, 0.63, 0.80, 1.00 mm

In case of sheets supplied in coil, the internal diameter of coil shall be 450, 510 and 610 mm and the mass of each coil shall not exceed 12 tonne.

Coils weighing more than 12 tonnes may be supplied subject to mutual agreement between the contracting parites.

6.2 Corrugated sheets.

Length- The length of the corrugated sheets shall be as follows: 2500, 3000 mm.

6.3 Zinc Coating

The weight of coating referred to in this specification shall represent the total weight of zinc both side inclusive.

On any sample selected at random from the delivery, one set of three samples each 50 x 50mm or 50mm diameter shall be selected at random from one sheet for every 500 G.S. sheets, the coating for the different classes shall be within the limit specified in table below;

TABLE A

Mass of Coating (Total Both Sides)

Grade of coating	*Minimum average coating Triple spot test g/sqm*	*Minimum coating single spot test g/sqm**
600	600	510
450	450	380
350	350	300
275	275	235

* minimum individual value obtained in triple spot test.

6.4 **Mass**

The mass of sheets and coils shall be calculated as given in Table B on the basis of nominal dimensions and mass of zinc coating.

Table B

Calculation of mass of sheets or coils

Type *of materials*	*Order of calculation*	*Method of calculation*	*Number of Numerals in resultant value*
Sheet	Mass of single sheet	Nominal mass of single sheet plus mass of zinc coating	Rounded off to 4 effective figures
	Total mass	Mass of single sheet (kg) x number of sheets	Rounded off to integral value of kg
Coil	Unit mass of coil	Unit mass of sheet (kg/m^2)x width (mm) X10-3	Rounded off to 3 effective figures
	Mass of single coil	Unit mass of coil (kg/m)x length (m)	
	Total mass (kg)	Total mass of each coil	Integral number of kg

Note:

(i) Nominal mass of single sheet shall be calculated by calculating the volume of the sheet and multiplying the same with density of sheet (density 7.85 g/ cubic cm) and rounding the same to 4 effective figures.

(ii) Mass of the coating shall be calculated by multiplying the surface area of single sheet with indicated/nominal coating mass (g/square meter) as shown for triple spot test (Table A).

(iii) For calculation of corrugated sheet mass, the width before corrugation shall be considered while calculating the area.

6.5 **Corrugations**

The depth and pitch of corrugation shall be as follows;

Grade	*Depth of Corrugation (mm)*	*Pitch of Corrugation (mm)*
A	17.5	75
B	12.5	75

The number of corrugations shall be 8,10, 11 or 13 per sheet. The overall width of the sheets before and after corrugation shall be as given in Table below.

TABLE C

Details of Corrugations

Number of corrugations	*Grade*	*Nominal overall width of sheet measured between crowns of outside corrugations*	
		Before corrugation mm	*After corrugation mm*
(1)	*(2)*	*(3)*	*(4)*
8	A	750	660
10	A	900	810
11	A	1000	910
13	A	1200	1110
8	B	750	680
10	B	900	830
11	B	1000	930
13	B	1200	1130

7 **Non Asbestos High Impact Poly Propylene Reinforced Cement Semi Corrugated Sheets Roofing**

Non Asbestos High Impact Poly Propylene Reinforced Cement Semi Corrugated Sheets shall be to IS 14871 : 2000. These sheets shall be free from cracks, chipped edge corners or other damages.

7.1 The laying shall be the same as CGS sheet except that

(i) The sheets shall be laid with the end stamped ‘Top' on the smooth side pointing towards the ridge,

(ii) The sheets shall invariably be laid from right to left starting at the eaves with the procedure for mitring etc.

(iii) The side laps provided will be of one corrugation, the left hand small corrugation of each sheet being covered by the right hand large corrugation of the next sheet.

(iv) Asbestos cement expansion joints shall be inserted every 45 metres or so in the length of the roof. Specially manufactured expansion joint pieces shall be used for the purpose. The end lap of expansion joints shall not be less than 150 mm. If the expansion Joints may be between the purlins, these should be stitched with seam bolts.

8 **RED OR WHITE SAND STONE ROOFING**

8.1 **Sand Stone Slabs**

Stone slabs shall be hard, sound and durable. The slabs shall be rough chisel dressed on the top so that the dressed surface shall not be more than 6 mm from a straight edge placed on it. The edges of the depressions or projections shall be chisel dressed in a slant, so that surface does not have sharp unevenness. The sides shall also, be chisel dressed to a minimum depth of 20 mm so that the dressed edges shall at no place be more than 3 mm from a straight edge butted against it. The thickness of the slab shall be uniform and as specified in the item with a permissible tolerance of 2 mm. The slabs shall be uniform in length, the length being 5 to 8 mm less than the centre to centre spacing of the supporting wooden Joists (Karries) or RCC battens. Unless the design require some other shape the slabs shall be rectangular.

The width of the slabs shall not be less than 40 cm. The maximun spacing of rafters (Karries) or RCC batten supporting the slab shall not mare then the spacing given below:-

Thickness of Slab	*Maximum Spacing of Rafters*
40 mm	52.5 cm.
45 mm	60 cm.
50 mm	68 cm.

8.2 **Laying**

The slabs shall be washed clean and wetted before being laid. The stone slabs shall be jointed in cement mortar 1:4 (1 cement: 4 coarse sand). The width of joints shall not be more than 8 mm not less than 5 mm. The top joints shall be finished flush and ceiling Joints pointed with the cement mortar 1:3 (1 cement: 3 fine sand).

9 In case of corrugated G.S. sheet, the sheet shall be laid on the roof with a lap of not less than 15 cm. at the end of two corrugation at the sides. The holes for the screws or bolt shall be drilled (not punched) from in side toward outside about 23 cm. apart or as directed by the Engineer-in-charge. On the sides and at every 2nd corrugation on the ends, care being taken that all holes shall occur on the ridge of the sheet on the outside as laid in a uniform pattern.

10 The rates for G.S. sheet roofing are inclusive of necessary overlaps and wastages in cutting and all standard screws, nuts, washers, bolts, patent 'J' & 'L' hooks, bolts and other fasteners required as per specifications unless otherwise specified.

11 In tiled roofing, the three lowest courses of tiles of each layer, ridge and hip tiles shall be set in cement mortar 1:6 (with pigment to match the colour of tiles and are inclusive of these items).

12 In Mangalore tiles, the three end rows at eves, gable or other exposed parts should be tied with G.I. wire 18 gauge.

13 The wooden planks, fixed in the ceiling shall be of 20mm thickness and shall be planned, moulded, beaded and fixed to the pattern as directed by the Engineer-in-charge. The wooden beading should be of size 65x12mm section, fixed to the frame work with necessary screws and spacing not exceeding 30cm. or as directed by the Engineer-in-Charge. The overlaps of beading shall be mitred at the junction.

14 The blown bitumen to be used for water proofing treatment shall conform to IS : 702.

15 The self finished felt type-2, grade-2 fibre base, self finished, bitumen felt shall conform to IS: 1322-1970.

16 Hessain base felt type-3 shall conform to IS : 1322-1970.

17 The rates include the cost of all materials, labour, T&P, wastages and hire & running charges of machineries etc. for all the items of this chapter.

(For Detail Refer Roofing specification / CPWD specification)

12.00 ROOFING			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rate)**
12.1	Providing corrugated Galvanised sheet roofing including vertical/curved surface fixed with polymer coated J or L hooks, bolts and nuts 8mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead and including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in orizontal/vertical or curved surfaces) excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.		
12.1.1	1.00mm thick with zinc coating not less than 275gm/m²	Sqm	808.00
12.1.2	0.80mm thick with zinc coating not less than 275gm/m²	Sqm	681.00
12.1.3	0.63 mm thick with zinc coating not less than 275gm/ m²	Sqm	572.00
12.1.4	Labour rate for Item No. 12.1.1 to 12.1.3	Sqm	44.00
12.2	Extra for straight cutting in C.G.S. sheet roofing for making opening of area exceeding 40 sq. decimeter for chimney stacks, sky light etc. :		
12.2.1	1.00 mm thick	Meter	21.00
12.2.2	0.80 mm thick	Meter	17.00
12.2.3	0.63 mm thick	Meter	17.00
12.3	Extra for circular cutting in C.G.S. sheet roofing for making opening of area exceeding 40 square decimeter :		
12.3.1	1.00 mm thick	Meter	124.00
12.3.2	0.80 mm thick	Meter	99.00
12.3.3	0.63 mm thick	Meter	99.00
12.4	Providing ridges or hips of width 60 cm over all width plain G.S. sheet fixed with polymer coated J. or L hooks, bolts and nuts 8 mm dia. G.I. limpet and bitumen washers complete.		
12.4.1	0.80mm thick with zinc coating not less than 275gm/m²	Meter	428.00
12.4.2	0.63mm thick with zinc coating not less than 275gm/m²	Meter	369.00
12.4.3	Labour rate for Item No. 12.4.1 to 12.4.2	Meter	97.00
12.5	Providing valleys of 90cm wide overall in plain G.S. sheet fixed with polymer coated J, or L hooks, bolts and nuts 8mm dia.. G.I. limpet and bitumen washers complete :		
12.5.1	1.60mm thick with zinc coating not less than 350gm/m²	Meter	842.00
12.5.2	Labour rate for Item No. 12.5	Meter	107.00
12.6	Providing flashing of 40 cm over all width in plain, G.S. sheet fixed with polymer coated J, or L hooks, bolts and nuts, G.I. limpet and bitumen washer complete, bent to shape and fixed in wall with cement mortar 1:3 (1cement : 3 coarse sand).		
12.6.1	1.00mm thick with zinc coating not less than 275gm/m²	Meter	299.00
12.6.2	Labour rate for Item No. 12.6	Meter	103.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.7	Providing and fixing plain G.S. sheet gutter with iron brackets 40x3mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipes complete.		
12.7.1	Providing and fixing 15 cm wide 45 cm over all semi circular plain G.S. sheet gutter with iron brackets 40x3mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipes complete.		
12.7.1.1	0.80mm thick with zinc coating not less than 275gm/m²	Meter	387.00
12.7.1.2	0.63mm thick with zinc coating not less than 275gm/m²	Meter	338.00
12.7.1.3	Labour rate for Item No. 12.7.1.1 to 12.7.1.2	Meter	102.00
12.7.2	Providing and fixing Trapezoidal (Top width 0.3m, bottem width 0.2m and depth 0.1m) plain G.S. sheet gutter with iron brackets 40x3mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipes complete.		
12.7.2.1	0.80mm thick with zinc coating not less than 275gm/m²	Meter	360.00
12.7.2.2	0.63mm thick with zinc coating not less than 275gm/m²	Meter	315.00
12.7.2.3	Labour rate for Item No. 12.7.1.1 to 12.7.1.2	Meter	95.00
12.8	Providing non-asbestos high impact Polypropylene reinforced cement 6 mm thick corrugated sheets (as per IS: 14871) roofing up to any pitch and fixing with polymer coated J, or L hooks, bolts and nuts 6mm dia. G.I. plain and bitumen washers or with self drilling fastener and EPDM washers etc. complete excluding the cost of purlins, rafters and trusses: corrugated sheets and including cutting to size and shape wherever required.	Sqm	305.00
12.9	Extra for straight cutting in non-asbestos polypropylene reinforced cement corrugated, semi-corrugated 6mm thick sheet roofing for making openings of area exceeding 40 square decimeter for chimney stacks, skylights etc.	Meter	17.00
12.10	Extra for circular cutting in non-asbestos polypropylene reinforced cement corrugated/semi-corrugated 6mm thick sheet roofing for making openings of area exceeding 40 square decimeter.	Meter	46.00
12.11	Extra for providing and fixing wind ties of 40x 6mm flat iron section.	Meter	95.00
12.12	Providing and fixing ridges and hips in non-asbestos fibre cement high impact polypropylene reinforced roofing with suitable fixing accessories or self drilling fastener and EPDM washer etc. complete.		
12.12.1	Corrugated serrated adjustable ridges	Meter	304.00
12.12.2	Plain wing adjustable ridges	Meter	316.00
12.12.3	Close fitting adjustable ridges	Meter	346.00
12.12.4	Unserrated adjustable hips	Meter	346.00
12.12.5	Labour rate for Item No. 12.12.1 to 12.12.4	Meter	24.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.13	Providing and fixing non-asbestos fibre cement high impact polypropylene reinforced roofing accessories in all colours with polymer coated J or L hooks, bolts and nuts and or G.I. seam bolts and nuts, G.I. plain and bitumen washers or with self drilling fastener and EPDM washer etc. complete:		
12.13.1	Corrugated apron pieces	Meter	185.00
12.13.2	Eave's filler pieces	Meter	196.00
12.13.3	North light curves	Meter	310.00
12.13.4	Ventilator curves	Meter	444.00
12.13.5	Barge boards	Meter	386.00
12.13.6	Ridge finials	Meter	175.00
12.13.7	Special north light curves	Meter	448.00
12.13.8	S type louvers	Meter	214.00
12.13.9	Labour rate for Item No. 12.13.1 to 12.13.8.2	Meter	12.00
12.13.10	Labour rate for Item No. 12.13.3 ,12.13.8.4 & 12.13.8.7	Meter	15.00
12.13.11	Labour rate for Item No. 12.13.8.5 &12.13.8.8	Meter	12.00
12.14	Providing flat iron brackets 50x3mm size with necessary bolts, nuts and washers etc. for fixing asbestos cement/G.S. sheets gutters with purlins.	Meter	51.00
12.14.1	Labour rate for Item No. 12.14	Meter	8.00
12.15	Painting top of roofs with bitumen of approved quality at 17kg per 10 sqm impregnated with a coat of coarse sand at 60 cudm per 10 sqm including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete :		
12.15.1	With residual type petroleum bitumen of penetration 80/100	Sqm	99.00
12.15.2	Labour rate for Item No. 12.15.1	Sqm	11.00
12.16	10 cm thick (average) mud phaska of damped brick earth on roofs laid to slope consolidated and plastered with 25 mm thick mud mortar mixed with bhusa at 35 kg per cum of earth and gobri leaping with mix 1:1 (1 clay : 1 cow dung) and covered with flat tile bricks of class designation 100 grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement and finished neat :		
12.16.1	With chimney brick tiles	Sqm	423.00
12.17	10cm thick (average) mud phaska of damped brick earth on roofs laid to slope consolidated and plastered with 25mm thick mud mortar with bhusha at 35kg per cum of earth and gobri leaping with mix 1:1 (1 clay : 1 cow-dung) and covered with machine moulded tile bricks of class designation 125 conforming to IS:2690 (Part I) - 1992 grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement and finished neat.		
12.17.1	With machine moulded Chimney brick tiles	Sqm	474.00
12.18	Extra for every additional 1 cm thickness of mud phaska	Sqm	6.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.19	Providing and laying brick tiles of class designation 100 over mumty roofs grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement, over a 12 mm layer of cement mortar 1:3 (1 cement : 3 fine sand) and finished neat :		
12.19.1	With chimney . brick tiles	Sqm	378.00
12.19.2	Labour rate for Item No.- 12.19.1	Sqm	44.00
12.20	Providing and laying pressed clay tiles (as per approved pattern 20 mm nominal thickness and of approved size) on roofs jointed with cement mortar 1:4 (1 cement : 4 coarse sand) mixed with 2% integral water proofing compound laid over a bed of 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) and finished neat complete.	Sqm	493.00
12.20.1	Labour rate for Item No.- 12.20	Sqm	66.00
12.21	Providing gola 75x75 mm in cement concrete M-15 with aggregate 10mm and down gauge including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design :		
12.21.1	In 75x75mm deep chase	Meter	84.00
12.21.2	Labour rate for Item No. 12.21.1	Meter	51.00
12.22	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete M-15 with aggregate of 20 mm nominal size over P.V.C. sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 (1cement : 3 coarse sand) and a coat of neat cement rounding the edge sand making and finishing the outlet complete.	Each	137.00
12.22.1	Labour rate for Item No. 12.22	Each	18.00
12.23	Providing sand stone slab for roofing and laying them in cement mortar 1 : 4 (1 cement : 4 coarse sand) over wooden karries or R.C.C. battens (Karries and battens to be paid separately) including pointing the ceiling joints with cement mortar 1:3 (1 cement : 3 fine sand) complete :		
12.23.1	Red sand stone slab		
12.23.1.1	40 to 50 mm thick	Sqm	348.00
12.23.2	White sand stone slab :		
12.23.2.1	40 to 50 mm thick	Sqm	360.00
12.23.3	Labour rate for Item No.- 12.23.1 to 12.23.2	Sqm	106.00
12.24	Providing and fixing fiber insulating board ceiling of approved quality with necessary nails etc.complete (frame work to be paid separately) :		
12.24.1	Natural colour insulating board		
12.24.1.1	12 mm thick	Sqm	424.00
12.24.2	White face insulating board		
12.24.2.1	12 mm thick	Sqm	543.00
12.24.3	Flame retardant face insulating board		
12.24.3.1	12 mm thick	Sqm	501.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.24.3.2	Labour rate for Item No. 12.24.1 to 12.24.3	Sqm	95.00
12.25	Providing and fixing flat pressed 3 layer medium density particle board or graded particle board (Grade I) IS: 3087 marked in ceiling with necessary nails etc. complete (frame work to be paid separately) :		
12.25.1	12 mm thick	Sqm	574.00
12.25.2	Labour rate for Item No.- 12.25.1	Sqm	98.00
12.26	Providing and fixing plain Multipurpose Cement board (High Pressure steam cured) as per IS : 14862 : 2000) with suitable fibre cement screw in ceiling etc. complete (frame work to be paid separately) :		
12.26.1	6 mm thick cement board	Sqm	420.00
12.26.2	Labour rate for Item No.- 12.26.1	Sqm	98.00
12.27	Extra for Circular cutting and waste in ceiling with:		
12.27.1	2nd class teak wood planks 20 mm thick	Meter	297.00
12.27.2	Natural colour insulating board		
12.27.2.1	12mm thick	Meter	120.00
12.27.3	White face insulating board:		
12.27.3.1	12mm thick	Meter	135.00
12.27.4	Flame retardant face insulating board:		
12.27.4.1	12mm thick	Meter	130.00
12.27.5	Standard quality hard board sheet:		
12.27.5.1	3 mm thick	Meter	112.00
12.27.5.2	4.5 mm thick	Meter	116.00
12.28	Extra for providing and fixing ceiling to curved surfaces in narrow widths	Sqm	83.00
12.29	Providing and fixing false ceiling with 12 mm thick plain/semi perforated or with design ceiling tiles of BWP type phenol formaldehyde synthetic resin bonded pressed particle board conforming to IS:3087 finished with a coat of aluminium primer on both sides & edges and two coats of synthetic enamel paint of approved quality on exposed face to be fixed on a grid made out of anodised aluminium(with 15 micron anodic coating) T-sections 35x15x1.5 mm size main runners and cross runners 23.5x19x1.5mm fixed to main runners placed 600 mm centre to centre both ways so as to form a grid of 600 mm square. The frame work shall be suspended from ceiling by level adjusting hangers of 6 mm dia M.S rod fixed to roof slab by means of ceiling cleats. The suspenders shall be placed 600x1200 mm centre to centre including fixing to the frame with C.P brace screws and applying a priming coat of zinc chromate yellow primer (aluminium frame work shall be paid separately).	Sqm	237.00
12.29.1	Labour rate for Item No.- 12.29	Sqm	98.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.30	Extra for providing 3mm thick translucent white acrylic plastic sheets of approved quality in false ceiling instead of 12 mm thick plain/or with design particle board ceiling tiles in item above.	Sqm	418.00
12.31	Providing 10mm thick plaster of Paris (gypsum anhydrous) ceiling up to a height of 5m above floor level over first class kail wood strips 25x6mm with 10mm gap in between and reinforced with rabbit wire mesh fixed to any frame (frame work to be paid separately) :		
12.31.1	Flat surfaces	Sqm	595.00
12.31.2	Curved surfaces	Sqm	658.00
12.32	Extra for any sunk or raised mouldings in the plaster of Paris (Gypsum anhydrous) ceiling	Sqm	162.00
12.33	Extra for providing plaster of Paris (Gypsum anhydrous) ceiling above 5 meters height from floor level.	sqm per meter	49.00
12.34	Providing and fixing thermal insulation of ceiling (under deck insulation) with Resin Bonded Fibre glass wool conforming to IS : 8193 density 24kg/m3, 50mm thick, wrapped in 200 G Virgin Polythene bags fixed to ceiling with metallic cleats (50x50x3 mm) @ 60 cm and wire mesh of 12.5mm x 24g wire and mesh, for top most ceiling of building.	Sqm	469.00
12.34.1	Labour rate for Item No.- 12.34	Sqm	62.00
12.35	Providing and fixing thermal insulation with Resin Bonded Fibre glass wool conforming to IS: 8193. Density 16kg/m3 , 50mm thick, wrapped in 200G Virgin Polythene bags placed over existing false ceiling and held in position by criss-crossing GI wire.	Sqm	242.00
12.35.1	Labour rate for Item No.- 12.35	Sqm	21.00
12.36	Thermal Insulation of roofing with Expanded polystyrene fixed with suitable adhesive to the false ceiling as per the directions of the Engineer-in-charge		
12.36.1	With Type N - Normal 50 mm thick	Sqm	227.00
12.36.2	With Type SE - Self Extinguishing type 50 mm thick	Sqm	325.00
12.37	Providing and fixing 100 mm diameter and 60 cm long rain water spout in cement mortar 1:4 (1 cement : 4 fine sand).		
12.37.1	Stone ware spout	Each	53.00
12.37.2	Labour rate for Item No. 12.37.1	Each	16.00
12.38	Providing and fixing M.S. holder bat clamps of approved design to C.I. or S.C.I. rain water pipes embedded in and including cement concrete blocks 10x10x10cm of M-15 grade concrete with aggregate 20 mm nominal size and cost of cutting holes and making good the walls etc. :		
12.38.1	100 mm diameter	Each	85.00
12.38.2	150 mm diameter	Each	97.00
12.38.3	Labour rate for Item No. 12.38.1 to 12.38.2	Each	57.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.39	Providing lead caulked joints to sand cast iron rain water pipes and fittings:		
12.39.1	100 mm diameter	Each	174.00
12.39.2	150 mm diameter	Each	244.00
12.39.3	Labour rate for Item No. 12.39.1 to 12.39.2	Each	58.00
12.40	Providing, fixing and embedding sand cast iron accessories for rain water pipes in the masonry surrounded with 12 mm thick cement mortar of the same mix, as that of masonry (lead caulking will be paid for separately) :		
12.40.1	Sand cast iron plain shoes :		
12.40.1.1	150 mm diameter	Each	402.00
12.40.1.2	Labour rate for Item No.- 12.40.1.1	Each	21.00
12.41	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion. (i) Single socketed pipes.		
12.41.1	75mm diameter	Meter	136.00
12.41.2	110mm diameter	Meter	240.00
12.41.3	Labour rate for Item No. 12.41.1 to 12.41.2	Meter	25.00
12.42	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.		
12.42.1	Coupler		
12.42.1.1	75mm	Each	160.00
12.42.1.2	110mm	Each	200.00
12.42.2	Single pushfit Coupler :		
12.42.2.1	75mm	Each	203.00
12.42.2.2	110mm	Each	254.00
12.42.3	Single tee with door		
12.42.3.1	75x75x75 mm	Each	333.00
12.42.3.2	110x110x110 mm	Each	504.00
12.42.4	Single tee without door		
12.42.4.1	75x75x75 mm	Each	290.00
12.42.4.2	110x110x110 mm	Each	392.00
12.42.5	Bend 87.5°		
12.42.5.1	75 mm bend	Each	163.00
12.42.5.2	110 mm bend	Each	258.00
12.42.6	Shoe (Plain)		
12.42.6.1	75 mm Shoe	Each	300.00
12.42.6.2	100 mm shoe	Each	535.00
12.42.7	Labour rate for Item No.- 12.42.1 to 12.42.6	Each	13.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.43	Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50mm hard wood plugs, screwed with M.S. screws of required length including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.		
12.43.1	75mm	Each	110.00
12.43.2	100mm	Each	135.00
12.43.3	Labour rate for Item No.- 12.43.1, 12.43.2	Each	58.00
12.44	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	Each	57.00
12.44.1	Labour rate for Item No.- 12.44	Each	5.00
12.45	Providing and fixing at all height false ceiling including providing and fixing of frame work made of special sections power pressed from M.S. sheet and galvanised in accordance with zinc coating of grade 350 as per IS : 277 and consisting of angle cleats of size 25mm wide x 1.6mm thick with flanges of 22mm and 37mm at 1200mm centre to centre one flange fixed to the ceiling with dash fastener 12.5mm diax40mm long with 6mm dia bolts to the angle hangers of 25x25x0.55mm of required length, and other end of angle hanger being fixed with nut and bolts to G.I. channels 45x15x0.9mm running at the rate of 1200mm centre to centre to which the ceiling section 0.5mm thick button wedge of 80mm with tapered flanges of 26mm each having clips of 10.5mm at 450mm centre to centre shall be fixed in a direction perpendicular to G.I. channel with connecting clips made out of 2.64mm dia 230mm long G.I. wire at every junction including fixing the gypsum board with ceiling section and peri meter channels 0.5mm thick 27mm high having flanges of 20mm and 30mm long,		
	the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450mm centre to centre with 25mm long drive-all screws @ 230mm interval including jointing and fixing to a flush finish of tapered and square edges of the board with recommended filler, jointing tapes, finisher and two coats of primer suitable for board as per manufactures specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed all complete as per drawing and specification and direction of the Engineer in Charge but excluding the cost of painting with :		
12.45.1	12.5 mm thick tapered edge gypsum board conforming to IS: 2095-Part I.	Sqm	718.00
12.45.2	Labour rate for Item No.- 12.45.1	Sqm	145.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.46	Providing and fixing to the inlet mouth of rain water pipe PTMT (an Engineering Thermoplastic) grating square (Slit) 150 mm square with a height of 8 mm and weighing not less than 100 gms.	Each	121.00
12.46.1	Labour rate for Item No.- 12.46	Each	5.00
12.47	Providing & fixing UV stabilised fiberglass reinforced plastic sheet roofing up to any pitch including fixing with polymer coated 'J' or 'L' hooks, bolts & nuts 8mm dia. G.I plain/bitumen washers complete but excluding the cost of purlins, rafters, trusses etc. The sheets shall be manufactured out of 2400 TEX panel rovigs incorporating minimum 0.3% Ultra-violet stabiliser in resin system under approximately 2400 psi and hot cured. They shall be of uniform pigmentation and thickness without air pockets and shall conform to IS 10192 and IS 12866.The sheets shall be opaque or translucent, clear or pigmented, textured or smooth as specified.		
12.47.1	2mm thick corrugated (2.5" or 4.2" or 6") or step-down (2" or 3" or 6") as specified.	Sqm	891.00
12.47.2	2mm thick flat.	Sqm	768.00
12.47.3	Labour rate for Item No.- 12.47.1, 12.47.2	Sqm	36.00
12.48	Providing & fixing pressed clay tile (Mangalore tile) 20 mm nominal hickness and of approved size and as per approved pattern ceiling on steel frame work complete (steel frame work to be paid separately).	Sqm	246.00
12.48.1	Labour rate for Item No.- 12.48	sqm	38.00
12.49	Providing & laying pressed clay tile ridge (Mangalore tile) of 20mm thickness of approved pattern ceiling over steel frame work complete (steel frame work to be paid separately).	Sqm	113.00
12.49.1	Labour rate for Item No.- 12.49	Sqm	9.00
12.50	Supply & installation of precoated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm ±5% total coated thickness (TCT) thick Zinc coating 120gsm as per IS: 277 in 240mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches while transportation and should be supplied in single length upto 12 meter or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling/self tapping screws of size (5.5x 55mm) with EPDM seal or with polymer coated J or L hooks, bolts and nuts 8mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead complete upto any pitch in horizontal/vertical or curved surfaces excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.	Sqm	578.00
12.50.1	Labour rate for Item No. 12.50	Sqm	20.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.51	Providing and fixing precoated galvanised steel sheet roofing accessories 0.50 mm +/- 5% total coated thickness (TCT) thick Zinc coating 120gsm as per IS: 277 in 240mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns using self drilling/ self tapping screws or with polymer coated J or L hooks, bolts and nuts and or G.I. seam bolts and nuts, G.I. plain and bitumen washers complete :		
12.51.1	Ridges plain (500 - 600mm).	Meter	558.00
12.51.2	Flashings/ Aprons.(Upto 600 mm)	Meter	546.00
12.51.3	North light curves.	Meter	621.00
12.51.4	Barge board (Upto 300 mm).	Meter	589.00
12.51.5	Crimp curve	Sqm	659.00
12.51.6	Gutter .(600 mm over all girth).	Meter	684.00
12.51.7	Labour rate for Item No. 12.51.1	Meter	24.00
12.51.8	Labour rate for Item No. 12.51.2	Meter	12.00
12.51.9	Labour rate for Item No. 12.51.3	Meter	14.00
12.51.10	Labour rate for Item No. 12.51.4	Meter	12.00
12.51.11	Labour rate for Item No. 12.51.5	Meter	13.00
12.51.12	Labour rate for Item No. 12.51.6	Meter	92.00
12.52	Providing and fixing False Ceiling Tiles of approved materials of size 595 x 595mm in true horizontal level suspended on inter locking metal grid of hot dipped galvanised steel sections (galvanized @ 170 gsm/sqm.) consisting of main "T" runner suitably spaced at joints to get required length and of size 24x38mm made from 0.30mm thick (minimum) sheet spaced at 1200mm center to center and cross "T" of size 24x25mm made of 0.30mm thick (minimum) sheet, 1200mm long spaced between main "T" at 600mm center to center to form a grid of 1200x600mm and secondary cross "T" of length 600mm and size 24x25mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600mm panel to form grids of 600x600mm and laying false ceiling tiles of approved texture in the grid including, wherever,required, cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats fixed to ceiling with 6 mm dia		
	and 50mm long dash fasteners, 4mm GI adjustable rods with galvanised level clips spaced at 1200m center to center along main T, bottom exposed width of 24mm of all T-sections shall be pre-painted with polyester paint, all complete at all heights as per specifications drawings and as directed by Engineer-in-Charge.(The rate is excluding cost of tiles which will be paid separately).	Sqm	374.00
12.52.1	Labour rate for Item No.- 12.52	Sqm	13.00

S.No.	Particulars of Items	Unit	Rate (in Rate)
12.53	Providing and fixing and applying plaster of paris (POP) false ceiling consisting of frame work made with 50 mm sq. M.S tubes of 18 G thickness as main runners at 600 mm c/c both ways, suspended/supported with M.S flats 25 x 4 mm from existing R.C.C slab including providing and fixing expanded metal of size 5.25 mm x 1.25 mm thickness welded to main runner and applying POP (Calcium sulphate semihydrate variety) to the expanded metal of thickness not less than 10mm finished smooth to line and level including necessary supports scaffolding etc. as required and also including applying a coat of red oxide zinc chromate primer over the M.S frame work and suspenders complete.	Sqm	962.00
12.53.1	Labour rate for Item No.- 12.53	Sqm	2.00

13.00 FINISHING WORK

Notes:

1 Plastering shall be done where shown on the drawing. Plastering shall be started from top and worked down. All putlog holes shall be properly filled in advance of the plastering while the scaffolding is being taken down. Wooden screeds 75mm wide and of the thickness of the plaster shall be fixed vertically 2.5 to 4 meters apart, to act as gauges and guides in applying the plaster. The mortar shall be laid on the wall between the screeds using the plasterer's float and pressing the mortar so that the raked joints are properly filled. The plaster shall then be finished off with a wooden straight edge reaching across the screeds. The straight edge shall be worked on the screeds with a small up ward and side ways motion 50mm to 75mm at a time. Finally, the surface shall be finished off with a plasterer's wooden float. Metal floats shall not be used.

Extra payment shall be made beyond 10 meter height for plaster and pointing .

2 Pointing shall be carried out using mortar not leaner than 1:3 by volume of cement and sand or as shown on the drawing. The mortar shall be filled and pressed into the raked joints before giving the required finish.

3 Curing shall be commenced as soon as the mortar used for finishing has hardened sufficiently not to be damaged during curing. It shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages.

4 For a white washing, class C lime i.e. fat lime shall be used.

5 For colour wash the colouring material shall be of approved make and as approved by Engineer-in-Charge.

6 Dry distemper shall conform to I.S. 427-1965.

7 Oil bound distemper shall conform to I.S. 428-1969.

8 Cement paint shall conform to I.S. 5410-1969.

9 Primer on wooden surfaces is to be followed by putty of two parts of white chalk powder, one part of enamel paint and added by turpentine oil proportionately to prepare a smooth surface by sand pappering.

10 Primer on metal steel surfaces shall be done with red oxide zinc chromite.

11 Synthetic enamel paint shall conform to I.S. 2932, IS 2933 and IS 133

12 Ready mixed paints shall conform to I.S. 3631

13 Clear synthetic varnish shall conform to IS 525

14 Copal varnish shall conform to I.S. 337

15 Waxing - A mixture of bee's wax and turpentine oil in proportion of 2 Bee's wax : 1½ double boiled linseed oil : 1 turpentine : ½ varnish shall be used. The wax is melted and added to turpentine.

16 The other paints etc. should conform to the follow ing specifications:

(a)	Aluminium paint	-	IS 2339
(b)	Black japan	-	IS 341
(c)	Anti corrosive Bituminious	-	IS158
(d)	Plastic emulsion paint	-	IS 5411
(e)	French polish	-	IS 348
(f)	Red oxide	-	IS 2074
(g)	Turpentine	-	IS 533
(h)	Double boiled linseed oil	-	IS 77

17 Painting of frames and shutters of doors, windows, ventilators, steel work, and corrugated sheets etc. will be measured by multiplying the length or width by the height of one face only and the area thus obtained being further multiplied by factors as per I.S. 1200 of mode of measurements for building works with further amendments if any.

18 In case of sponge/sand faced (Non plain or equivalent) plastered surface of wall, the area measured, is to be multiplied by the factor 1.50 for payments of white wash, colour wash and distempering for one or more coats of required finish.

19 The rates in this chapter are for all locations like walls, ceiling, sloping roofs and in all floors and heights and depths, and for all shades with cost of all materials, labour, scaffoldings, T & P, hire & running charges of machineries, ladders, cans, brushes and other appliances etc. required for the efficient execution of work.

20 Lime wash
This shall be applied in a thick coat after curing the plaster for three days.

21 Oil bound distemper is not recommended to be applied, within six months of the completion of wall plaster. However, newly plastared surfaces if required to be distempered before a period of six months shall be given a coat of alkali resistant priming Paint conforming to IS 109 and allowed to dry for atleast 48 hours before distempering is commenced.

Measurement

(1) Plaster :- Length and breadth shall be measured correct to a cm and its area shall be calculated in square meters correct to two places of decimal.

(2) Pointing :- Length and breadth shall be measured correct to a cm and its area shall be calculated in square meters upto two places of decimal.

The various types of pointing for example, struck, keyed, flush, tuck, etc. shall each be measured separately.

Pointing on different types of walls, floors, roofs etc. shall each be measured separately. The type and material of the surface to be pointed shall be described.

(3) Painting/Washing/Distempering :- The length and breadth shall be measured correct to a cm. The area shall be calculated in sqm.

(For Detail Specification Refer Chapter of Finishing specification)

13.00 FINISHING			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
13.1	12 mm cement plaster of mix :		
13.1.1	1:4 (1 cement: 4 fine sand)	Sqm	108.00
13.1.2	1:5 (1 cement: 5 fine sand)	Sqm	102.00
13.1.3	1:6 (1 cement: 6 fine sand)	sqm	95.00
13.1.4	Labour rate for Item No. 13.1.1 to 13.1.3	Sqm	48.00
13.2	15mm cement plaster on the rough side of single or half brick wall of mix :		
13.2.1	1:4 (1 cement: 4 fine sand)	Sqm	127.00
13.2.2	1:5 (1 cement: 5 fine sand)	Sqm	119.00
13.2.3	1:6 (1 cement: 6 fine sand)	Sqm	112.00
13.2.4	Labour rate for Item No. 13.2.1 to 13.2.3	Sqm	55.00
13.3	20 mm cement plaster of mix :		
13.3.1	1:4 (1 cement: 4 fine sand)	Sqm	156.00
13.3.2	1:5 (1 cement: 5 fine sand)	Sqm	146.00
13.3.3	1:6 (1 cement: 6 fine sand)	Sqm	137.00
13.3.4	Labour rate for Item No. 13.3.1 to 13.3.3	Sqm	63.00
13.4	12 mm cement plaster of mix :		
13.4.1	1:4 (1 cement: 4 coarse sand)	Sqm	107.00
13.4.2	1:5 (1 cement: 5 coarse sand)	Sqm	102.00
13.4.3	1:6 (1 cement: 6 coarse sand)	Sqm	95.00
13.4.4	Labour rate for Item No. 13.4.1 to 13.4.3	Sqm	48.00
13.5	15 mm cement plaster on rough side of single or half brick wall of mix		
13.5.1	1:4 (1 cement: 4 coarse sand)	Sqm	124.00
13.5.2	1:5 (1 cement: 5 coarse sand)	Sqm	119.00
13.5.3	1:6 (1 cement: 6 coarse sand)	Sqm	110.00
13.5.4	Labour rate for Item No. 13.5.1 to 13.5.3	Sqm	55.00
13.6	20 mm cement plaster of mix :		
13.6.1	1:4 (1 cement: 4 coarse sand)	Sqm	153.00
13.6.2	1:5 (1 cement: 5 coarse sand)	Sqm	146.00
13.6.3	1:6 (1 cement: 6 coarse sand)	Sqm	135.00
13.6.4	Labour rate for Item No. 13.6.1 to 13.6.3	Sqm	63.00
13.7	12 mm cement plaster finished with a floating coat of neat cement of mix :		
13.7.1	1:3 (1 cement: 3 fine sand)	Sqm	145.00
13.7.2	1:4 (1 cement: 4 fine sand)	Sqm	133.00
13.7.3	1:5 (1 cement: 5 fine sand)	Sqm	127.00
13.7.4	Labour rate for Item No. 13.7.1 to 13.7.3	Sqm	59.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.8	15 mm cement plaster on rough side of single or half brick wall finished with a floating coat of neat cement of mix :		
13.8.1	1:3 (1 cement: 3 fine sand)	Sqm	166.00
13.8.2	1:4 (1 cement: 4 fine sand)	Sqm	151.00
13.8.3	1:5 (1 cement: 5 fine sand)	Sqm	144.00
13.8.4	Labour rate for Item No. 13.8.1 to 13.8.3	Sqm	66.00
13.9	12 mm cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.	Sqm	143.00
13.9.1	Labour rate for Item No. 13.9	Sqm	61.00
13.9.2	cement plaster 1:3(1 cement : coarse sand) finished with coat of neat cement		
13.9.2.1	20 mm cement plaster	Sqm	197.00
13.9.3	Labour rate for Item No.- 13.9.2.1	Sqm	74.00
13.10	15 mm cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement on the rough side of single or half brick wall.	Sqm	163.00
13.10.1	Labour rate for Item No.- 13.10	Sqm	66.00
13.11	18 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement: 5 coarse sand) finished with a top layer 6mm thick cement plaster 1:6 (1 cement: 6 fine sand).	Sqm	149.00
13.11.1	Labour rate for Item No. 13.11	Sqm	74.00
13.12	18 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement: 5 coarse sand) and a top layer 6mm thick cement plaster 1:3 (1 cement: 3 coarse sand) finished rough with sponge.	Sqm	160.00
13.12.1	Labour rate for Item No. 13.12	Sqm	74.00
13.13	12 mm cement plaster 1:2 (1 cement: 2 stone dust)	Sqm	124.00
13.13.1	Labour rate for Item No. 13.13	Sqm	49.00
13.14	15 mm cement plaster 1:2 (1 cement: 2 stone dust) on the rough side of single or half brick wall.	Sqm	145.00
13.14.1	Labour rate for Item No. 13.14	Sqm	56.00
13.15	20 mm cement plaster 1:2 (1 cement: 2 stone dust)	Sqm	180.00
13.15.1	Labour rate for Item No.- 13.15	Sqm	63.00
13.16	6 mm cement plaster of mix :		
13.16.1	1:3 (1 cement: 3 fine sand)	Sqm	83.00
13.16.2	Labour rate for Item No. 13.16.1	Sqm	45.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.17	6 mm cement plaster 1:3 (1 cement: 3 fine sand) finished with a floating coat of neat cement and thick coat of Lime wash on top of walls when dry for bearing of R.C.C. slabs and beams.	Sqm	112.00
13.17.1	Labour rate for Item No.- 13.17	Sqm	60.00
13.18	Neat cement punning	Sqm	25.00
13.18.1	Labour rate for Item No.- 13.18	Sqm	11.00
13.19	Rough cast plaster upto 10m height above ground level with a mixture of sand and gravel or crushed stone from 6mm to 10mm nominal size dashed over and including the fresh plaster in two layers, under layer 12mm cement plaster 1:4 (1 cement: 4 coarse sand) and top layer 10mm cement plaster 1:3 (1 cement: 3 fine sand) mixed with 10% finely grounded hydrated lime by volume of cement.		
13.19.1	Ordinary cement finish using ordinary cement	Sqm	257.00
13.19.2	Labour rate for Item No.- 13.19.1	Sqm	125.00
13.20	Pebble dash plaster upto 10m height above ground level with a mixture of washed pebble or crushed stone 6mm to 12.5mm nominal size dashed over and including fresh plaster in two layers under layer 12mm cement plaster 1:4 (1 cement: 4 coarse sand) and top layer 10mm cement plaster with cement mortar 1:3 (1 cement: 3 fine sand) mixed with 10% finely grounded hydrated lime by volume of cement.	Sqm	248.00
13.20.1	Labour rate for Item No. 13.20	Sqm	118.00
13.21	Extra for providing and mixing water proofing material in cement plaster work in proportion recommended by the manufacturers.	1 Kg Water Proofing material per bag (50Kg)	66.00
13.22	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	20.00
13.23	Extra for plastering on circular work not exceeding 6 m in radius:		
13.23.1	In one coat	Sqm	9.00
13.23.2	In two coat	Sqm	14.00
13.24	Extra for plastering done on moulding cornices or architraves including neat finish to line and level:		
13.24.1	In one coat	Sqm	130.00
13.24.2	In two coat	Sqm	215.00
13.25	Extra for plastering :		

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.25.1	Spherical ceiling	Sqm	34.00
13.25.2	Groined ceiling	Sqm	37.00
13.25.3	Flewing soffits	Sqm	22.00
13.26	Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete	Sqm	64.00
13.26.1	Providing and applying 1.5 mm thick (in two coat) white cement based wall putty of best quality, over plastered surface to prepare the surface even and smooth complete.	Sqm	82.00
13.26.2	Labour rate for Item No. 13.26 to 13.26.1	Sqm	40.00
13.27	Extra for lining out plaster to imitate stone or concrete blocks walling	Sqm	21.00
13.28	12 mm thick plain cement mortar bands in cement mortar 1:4 (1 cement: 4 fine sand) :	1 cm wide 1m length	
13.28.1	Flush Band	Meter	2.00
13.28.2	Sunk Band	Meter	2.00
13.28.3	Raised Band	Meter	2.00
13.28.4	Moulded Band	Meter	3.00
13.28.5	Labour rate for Item No. 13.28.1	Meter	1.00
13.28.6	Labour rate for Item No. 13.28.2	Meter	1.00
13.28.7	Labour rate for Item No. 13.28.3	Meter	2.00
13.28.8	Labour rate for Item No. 13.28.4	Meter	3.00
13.29	18 mm thick plain cement mortar band in cement mortar 1:4 (1 cement:4 fine sand):		
13.29.1	Flush Band	Meter	2.00
13.29.2	Sunk Band	Meter	2.00
13.29.3	Raised Band	Meter	3.00
13.29.4	Moulded Band	Meter	5.00
13.29.5	Labour rate for Item No. 13.29.1	Meter	1.00
13.29.6	Labour rate for Item No. 13.29.2	Meter	2.00
13.29.7	Labour rate for Item No. 13.29.3	Meter	2.00
13.29.8	Labour rate for Item No. 13.29.4	Meter	4.00
13.30	18 mm thick moulded cement mortar band in two coats under layer 12mm thick with cement mortar 1:5 (1 cement: 5 coarse sand) top layer 6mm thick with cement mortar 1:4 (1 cement: 4 fine sand).	cm per meter	4.00
13.30.1	Labour rate for Item No. 13.30	cm per meter	4.00
13.31	Pointing on brick work or brick flooring with cement mortar 1:3 (1 cement: 3 fine sand) :		
13.31.1	Flush / Ruled/ Struck or weathered pointing.	Sqm	59.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.31.2	Raised and cut pointing	Sqm	95.00
13.31.3	Labour rate for Item No. 13.31.1	Sqm	42.00
13.31.4	Labour rate for Item No. 13.31.2	Sqm	69.00
13.32	Pointing on tile brick work with cement mortar 1:3 (1cement:3 fine sand)		
13.32.1	Flush/ Ruled/ Struck or weathered pointing	Sqm	82.00
13.32.2	Labour rate for Item No. 13.32.1	Sqm	56.00
13.33	Pointing on stone work with cement mortar 1:3 (1 cement: 3 fine sand) :		
13.33.1	Flush/ Ruled pointing	Sqm	80.00
13.33.2	Raised and cut pointing	Sqm	144.00
13.33.3	Labour rate for Item No. 13.33.1	Sqm	66.00
13.33.4	Labour rate for Item No. 13.33.2	Sqm	122.00
13.34	Raised and cut pointing on stone work in white cement mortar 1:3 (1white cement: 3 marble dust)	Sqm	161.00
13.34.1	Labour rate for Item No. 13.34	Sqm	122.00
13.35	Pointing on stone slab ceiling with cement mortar 1:2 (1 cement: 2 fine sand):		
13.35.1	Flush/ Ruled pointing	Sqm	47.00
13.35.2	Labour rate for Item No. 13.35.1	Sqm	36.00
13.36	Extra for pointing on walls on the outside at height more than 10m from ground level for every additional height of 3m or part there of.	Sqm	3.00
13.37	White washing with lime to give an even shade:		
13.37.1	New work (three or more coats)	Sqm	8.00
13.37.2	Labour rate for Item No. 13.37.1	Sqm	6.00
13.38	Satna lime wash on walls one coat	Sqm	3.00
13.38.1	Labour rate for Item No. 13.38.1	Sqm	2.00
13.39	Colour washing such as green, blue or buff to give an even shade		
13.39.1	New work (two or more coats) with a base coat of white washing with lime	Sqm	11.00
13.39.2	New work (two or more coats) with a base coat of whiting	Sqm	11.00
13.39.3	Labour rate for Item No. 13.39.1 to 13.39.2	Sqm	8.00
13.40	Distempering with dry distemper of approved brand and manufacture (two or more coats) and of required shade on new work,over and including priming coat of whiting to give an even shade.	Sqm	33.00
13.40.1	Labour rate for Item No.- 13.40	Sqm	25.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.41	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade		
13.41.1	New work (two or more coats) over and including priming coat with cement primer.	Sqm	52.00
13.41.2	Labour rate for Item No. 13.41.1	Sqm	32.00
13.42	Distempering with 1st quality acrylic washable distemper (ready mixed) of approved manufacturer and of required shade and colour complete. as per manufacturer's specification.		
13.42.1	Two or more coats on new work.	Sqm	29.00
13.42.2	Labour rate for Item No. 13.42.1	Sqm	18.00
13.43	Applying one coat of cement primer of approved brand and manufacture on wall surface :		
13.43.1	Cement primer.	Sqm	22.00
13.43.2	Labour rate for Item No. 13.43.1	Sqm	13.00
13.44	Finishing walls with water proofing cement paint of required shade		
13.44.1	New work (Two or more coats applied @ 3.84 kg/10 sqm).	Sqm	37.00
13.44.2	Labour rate for Item No. 13.44.1	Sqm	17.00
13.45	Finishing walls with textured exterior paint of required shade :		
13.45.1	New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including base coat of water proofing cement paint applied @ 2.20kg/10 sqm.	Sqm	125.00
13.45.2	Labour rate for Item No. 13.45.1	Sqm	20.00
13.46	Finishing walls with Acrylic Smooth exterior paint of required shade.		
13.46.1	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including base coat of water proofing cement paint applied @ 2.20 kg/ 10 sqm).	Sqm	64.00
13.46.2	Labour rate for Item No. 13.46.1	Sqm	20.00
13.47	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade		
13.47.1	New work (Two or more coats applied @ 1.43 ltr/ 10 sqm. over and including base coat of water proofing cement paint applied @ 2.20 kg/ 10 sqm).	Sqm	76.00
13.47.2	Labour rate for Item No. 13.47.1	Sqm	20.00
13.48	Finishing walls with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications :		
13.48.1	Two or more coats applied @ 1.25 ltr/10 sqm. over and including one coat of Special primer applied @ 0.75 ltr/10 sqm.	Sqm	75.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.48.2	Painting wood work with Deluxe Multi Surface Paint of required shade. Two or more coat applied @0.90 ltr/10 sqm over an under coat of primer applied @0.75 ltr/ 10 sqm of approved brand or manufacture	Sqm	63.00
13.48.3	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/ 10 sqm of approved brand or manufacture	Sqm	65.00
13.48.4	Labour rate for Item No. 13.48.1 to 13.48.3	Sqm	20.00
13.49	Extra for applying water proofing cement paint as primer, applied @ 2.2 kg/ 10 sqm, instead of primer for exterior finishing as given in Item No. 13.48.1	Sqm	1.00
13.50	Applying priming coat :		
13.50.1	With ready mixed pink or Grey primer of approved brand and manufacture on wood work (hard and soft wood)	Sqm	21.00
13.50.2	With ready mixed aluminium primer of approved brand and manufacture on resinous wood and plywood	Sqm	20.00
13.50.3	With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/steel works	Sqm	16.00
13.50.4	With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel work (second coat)	Sqm	9.00
13.50.5	Labour rate for Item No. 13.50.1 to 13.50.4	Sqm	5.00
13.51	Painting one thin coat with white lead of approved brand and manufacture on wet or patchy portion of plastered surfaces	Sqm	26.00
13.52	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.		
13.52.1	On steel work	Sqm	96.00
13.52.2	On concrete work	Sqm	98.00
13.52.3	Labour rate for Item No. 13.52.1 to 13.52.2	Sqm	33.00
13.53	Painting on G.S. sheet with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :		
13.53.1	New work (two or more coats) including a coat of approvedsteel primer but excluding a coat of mordant solution.	Sqm	47.00
13.53.2	Labour rate for Item No. 13.53.1	Sqm	28.00
13.54	Applying a coat of mordant solution on G.S. sheet :		

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.54.1	With a solution of 38 gms of copper acetate in a litre of soft water	Sqm	14.00
13.54.2	With a solution made of 13 gms of hydrochloric acid in a solution of 13 gms each of copper chloride, copper nitrate and ammonium chloride dissolved in a litre of soft water.	Sqm	14.00
13.54.3	Labour rate for Item No. 13.54.1 to 13.54.2	Sqm	10.00
13.55	Painting (two or more coats) on rain water, soil, waste and vent pipes and fittings with black anticorrosive bitumastic paint approved brand and manufacture over and including a priming of ready mixed zinc chromate yellow primer on new work :		
13.55.1	100 mm diameter pipes	meter	20.00
13.55.2	150 mm diameter pipes	meter	30.00
13.55.3	Labour rate for Item No. 13.55.1	meter	11.00
13.55.4	Labour rate for Item No. 13.55.2	meter	15.00
13.56	Painting (two or more coats) on rain water, soil, waste and vent pipes and fittings with synthetic enamel paint of approved brand and manufacture and required colour over a priming coat of approved steel primer on new work.		
13.56.1	100 mm diameter pipes	meter	22.00
13.56.2	150 mm diameter pipes	meter	33.00
13.56.2	Labour rate for Item No. 13.56.1	meter	11.00
13.56.3	Labour rate for Item No. 13.56.2	meter	15.00
13.57	Painting with oil type wood preservative of approved brand and manufacture:		
13.57.1	New work (two or more coats)	Sqm	16.00
13.57.2	Labour rate for Item No. 13.57.1	Sqm	6.00
13.58	Providing and applying two coats of fire retardant paint unthinned on cleaned wood/ply surface @ 3.5 sqm per litre per coat including preparation of base surface as per recommendations of manufacturer to make the surface fire retardant.	Sqm	280.00
13.58.1	Labour rate for Item No. 13.58	Sqm	23.00
13.59	Coal tarring two coats on new work using 0.16 and 0.12 litre coal tar per sqm in the first coat and second coat respectively.	Sqm	19.00
13.59.1	Labour rate for Item No. 13.59	Sqm	9.00
13.60	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade:		
13.60.1	Two or more coats on new work	Sqm	53.00
13.60.2	Labour rate for Item No. 13.60.1	Sqm	23.00
13.61	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :		

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.61.1	Two or more coats on new work	Sqm	45.00
13.61.2	Labour rate for Item No. 13.61.1	Sqm	23.00
13.62	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade:		
13.62.1	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture.	Sqm	65.00
13.62.2	Labour rate for Item No. 13.62.1 to 13.62.1	Sqm	33.00
13.63	Painting with aluminium paint of approved brand and manufacture to give an even shade		
13.63.1	Two or more coats on new work	Sqm	43.00
13.63.2	Labour rate for Item No. 13.63.1	Sqm	23.00
13.64	Painting with acid proof paint of approved brand and manufacture of required colour to give an even shade:		
13.64.1	Two or more coats on new work.	Sqm	53.00
13.64.2	Labour rate for Item No. 13.64.1	Sqm	23.00
13.65	Painting with black anti-corrosive bitumastic paint of approved brand and manufacture to give an even shade:		
13.65.1	Two or more coats on new work.	Sqm	35.00
13.65.2	Labour rate for Item No. 13.65.1	Sqm	23.00
13.66	Floor painting with floor enamel paint of approved brand and manufacture of required colour to give an even shade:		
13.66.1	Two or more coats on new work.	Sqm	49.00
13.66.2	Labour rate for Item No. 13.66.1	Sqm	23.00
13.67	Varnishing with varnish of approved brand and manufacture:		
13.67.1	Two or more coats of glue sizing with copal varnish over an under coat of flatting varnish.	Sqm	66.00
13.67.2	Two or more coats glue sizing with spar varnish or an under coat of flatting varnish.	Sqm	68.00
13.67.3	Labour rate for Item No. 13.67.1 to 13.67.2	Sqm	38.00
13.68	French spirit polishing :		
13.68.1	Two or more coats on new works including a coat of wood filler.	Sqm	98.00
13.68.2	Labour rate for Item No. 13.68.1	Sqm	76.00
13.69	Polishing on wood work with ready mixed wax polish of approved brand and manufacture :		
13.69.1	New work	Sqm	46.00
13.69.2	Labour rate for Item No. 13.69.1	Sqm	34.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.70	Floor polishing on masonry or concrete floors with wax polish of approved brand and manufacture.	Sqm	21.00
13.70.1	Labour rate for Item No.- 13.70	Sqm	17.00
13.71	Lettering with black Japan paint of approved brand and manufacture	per letter per cm height	1.20
13.71.1	Labour rate for Item No. 13.71	per letter per cm height	1.10
13.72	Washed stone grit plaster on exterior walls of height upto 10 M. above level in two layers, under layer 12mm cement plaster 1:4 (1 cement: 4 coarse sand) furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per square meter, top layer 15mm cement plaster 1:1/2:2 (1 cement: 1/2 coarse sand : 2 stone chipping 10mm nominal size) in panels with groove all around as per approved pattern including scrubbing and washing, the top layer with brushes and water to expose the stone chippings ,complete as per specification and direction of Engineer-in- charge (Payment for providing grooves shall be made separately).	Sqm	326.00
13.72.1	Labour rate for Item No.- 13.72	Sqm	168.00
13.73	Forming groove of uniform size in the top layer of washed stone grit plaster as per approved pattern using wooden battens, nailed to the under layer including removal of wooden battens, repair to the edges of panels and finishing the groove complete as per specifications and direction of the Engineer-in-charge :		
13.73.1	15 mm wide and 15 mm deep groove	meter	14.90
13.73.2	20 mm wide and 15 mm deep groove	meter	15.00
13.73.3	Labour rate for Item No.- 13.73.1, 13.73.2	meter	11.80
13.74	Extra for washed grit plaster on exterior walls of height more than 10m from ground level for every additional height of 3 m or part thereof.	Sqm	45.00
13.75	Extra for washed stone grit plaster on circular work not exceeding 6m in radius (in two coats).	Sqm	28.00
13.76	Forming groove of uniform size from 12x12mm and upto 25x15mm in plastered surface as per approved pattern using wooden battens, nailed to the under layer including removal of wooden battens, repairs to the edges of plaster panel and finishing the groove complete as per specifications and direction of the Engineer-in-Charge.	meter	15.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
13.76.1	Labour rate for Item No.- 13.76	meter	12.00
13.77	Extra for using white cement in place of ordinary cement in the top layer of the item of washed stone grit plaster.	Sqm	88.00
13.78	Providing and applying 12 mm thick (average) premixed formulated one coat gypsum lightweight plaster having additives and light weight aggregates as vermiculite/ perlite respectively conforming to IS: 2547 (Part - 1 & II) 1976, applied on hacked / uneven background such as bare brick/ block/ RCC work on walls & ceiling at all floors and locations, finished in smooth line and level etc. complete.	Sqm	181.00
13.78.1	Labour rate for Item No.- 13.78	Sqm	49.00

14.00 REPAIRS OF BUILDINGS

Notes:

IS 419 Specifications for Putty for use in Window Frames
IS 14900 Specifications for Transparent Float Glass

1 Repairs to plaster work include cutting the patch and preparing the wall surface. Patches of 2.50 square meters and less in area shall be covered under this chapter. Plastering in patches over 2.50 square meters in area shall be paid for at the rate as applicable to new work.

2 Doors, windows and ventilators in existing opening shall be conveniently erected in position. The hold fasts of overall lenght of 40cm. shall be embedded all round in cement concrete block of size 30x10x20cm. where necessary. Masonry shall be chipped carefully and uniformly to admit easy insertion of frame in opening.

3 Before making opening in the masonry, it is necessary to examine that the wall exclusive of opening is adequate to take the load coming on the structure. All precautions as explained in chapter of demolishing & dismentaling should be followed.

4 Renewing glass panes with putty and nails or with wooden fillets:
Materials shall conform to I.S. 1761-1960.

5 Fixing fan clamps in existing R.C.C. slabs shall be done without any damage to adjoining portion of the ceiling. The fan clamps to be fixed in R.C.C. shall be not less than 16mm. in diameter M.S. bar. The fixing shall be done by making chases of size 15x7.50cm. in ceiling to R.C.C. surfaces. The two arms at the ends of the clamps shall be passed through the space over the reinforcement bar from the bottom of the slab. The chase in the ceiling filled with cement concrete M 15 grade & curing shall be done as per specifications.

6 R.C.C. columns and beams which have cracked or where reinforcements have deteriorated, shall be repaired by guniting, where necessary, centering for the beams and slabs and shoring for the columns in both the planes shall be provided before guniting is started. Curing shall be done as per specifications.

7 Repairs to flooring shall be done with proper slope as per the existing floor slope, no damage shall be done to the existing floor panel edges of adjoining panels.

8 The rates include, unless otherwise specified, cost of all materials, labour, scaffolding, T & P and hire, running charges of machineries etc. for all leads and lifts required for the work.

(For Detail Specification Refer Chapter of Repairs of Buildings specification)

14.00 REPAIRS OF BUILDINGS			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
14.1	Repairs to plaster of thickness 12mm to 20mm in patches of area 2.5 sq. meter and under including cutting the patch in proper shape, raking out joints and preparing and plastering the surface of the walls complete including disposal of rubbish to the dumping ground with in 50 meters lead :		
14.1.1	With cement mortar 1:4 (1 cement : 4 fine sand)	Sqm	158.00
14.1.2	With cement mortar 1:4 (1cement: 4 coarse sand).	Sqm	138.00
14.1.3	Labour rate for Item No. 14.1.1 to 14.1.2	Sqm	64.00
14.2	Fixing chowkhats in existing opening including embedding chowkhats in floors or walls cutting masonry for holdfasts embedding hold fasts in cement concrete blocks with cement concrete grade M-10 (Nominal Mix with 20mm maximum size of stone aggregate) painting two coats of approved wood preservative to sides of chowkhats and making good the damages to walls and floors as required complete including disposal of rubbish to the dumping ground within 50 meter lead :		
14.2.1	Door chowkhats	Each	441.00
14.2.2	Window chowkhats	Each	270.00
14.2.3	Clerestory window chowkhats	Each	196.00
14.2.4	Labour rate for Item No. 14.2.1	Each	148.00
14.2.5	Labour rate for Item No. 14.2.2	Each	179.00
14.2.6	Labour rate for Item No. 14.2.3	Each	141.00
14.3	Fixing chowkhat in existing opening in brick / RCC wall with dash fasteners of appropriate size/ chemical fastener (3nos on each vertical member of door chowkhat and 2 nos. on each vertical member of window 1.20 meter height as per UADD/CPWD specification including Cost of dash fasteners/ chemical fastener.	Each	151.00
14.3.1	Labour rate for Item No. 14.3	Each	12.00
14.4	Making the opening in brick masonry including dismantling in floor or walls by cutting masonry and making good the damages to walls, flooring and jambs complete to match existing surface i/c disposal of mulba/ rubbish to the nearest municipal dumping ground.		
14.4.1	For door/ window/ clerestory window.	Sqm	263.00
14.4.2	Labour rate for Item No. 14.4.1	Sqm	227.00
14.5	Renewing glass panes, with putty and nails wherever necessary:		
14.5.1	Float glass panes of thickness 4 mm	Sqm	534.00
14.5.2	Float glass panes of thickness 5.5 mm	Sqm	713.00
14.5.3	Labour rate for Item No. 14.5.1 to 14.5.2	Sqm	95.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.6	Renewing glass panes, with wooden fillets wherever necessary:		
14.6.1	Float glass panes of thickness 4 mm	Sqm	634.00
14.6.2	Float glass panes of thickness 5.5 mm	Sqm	813.00
14.6.3	Labour rate for Item No. 14.6.1 to 14.6.2	Sqm	186.00
14.7	Renewing glass panes and refixing existing wooden fillets:		
14.7.1	Float glass panes of thickness 4 mm	Sqm	543.00
14.7.2	Float glass panes of thickness 5.5 mm	Sqm	722.00
14.7.3	Labour rate for Item No. 14.7.1 to 14.7.2	Sqm	124.00
14.8	Supplying and fixing new wooden fillets wherever necessary:		
14.8.1	2nd class teak wood fillets	meter	24.00
14.8.2	Hollock wood fillets.	meter	18.00
14.9	Renewal of old putty of glass panes (length)	meter	12.00
14.10	Refixing old glass panes with putty and nails	Sqm	162.00
14.11	Fixing old glass panes with wooden fillets (excluding cost of fillets)	Sqm	130.00
14.12	Providing and fixing 16 mm M.S. Fan clamps of standard shape and size in existing R.C.C. slab including cutting chase and making good and painting exposed portion of the clamps complete.	Each	142.00
14.13	Regrading terracing of mud phaska covered with tiles or brick, in cement by dismantling tiles or bricks, removing mud plaster preparing the surface of mud phaska to proper slope relaying mud plaster gobri leaping and tiles or bricks, grouted in cement mortar 1:3 (1cement : 3 fine sand) including replacing unserviceable tiles or bricks with new ones and disposal of unserviceable material to the dumping ground (the cost of the new tiles or brick excluded) within 50 meters lead.	Sqm	147.00
14.14	Replacing sand stone slabs in roofing laid in cement mortar 1:4 (1 cement : 4 coarse sand) including necessary repairs and cement pointing with same mortar complete including disposal of rubbish to dumping ground within 50 meters of lead :		
14.14.1	Red/ white sand stone slabs 30 to 50 mm thick.	Sqm	396.00
14.14.2	Labour rate for Item No. 14.14.1	Sqm	144.00
14.15	Supply and replacing wooden battens in old roofs, including making good the holes in wall and painting with oil type wood preservative of approved brand and manufacture complete including removal of rubbish to the dumping ground within 50 meters lead :		
14.15.1	Other then teak wood battens.	Cum	62024.00
14.15.2	Labour rate for Item No. 14.15.1	Cum	1959.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.16	Supply and replacing wooden beams in old roofs including making good the holes in walls and painting with oil type wood preservative of approved brand and manufacture complete including removal of rubbish to the dumping ground within 50 meters lead :		
14.16.1	Not exceeding 4.00 meters in length.		
14.16.1.1	Other then teak wood beams	Cum	68887.00
14.16.1.2	Hollock wood beams	Cum	40463.00
14.16.2	Above 4.00 meters and upto 5.00 meters length.		
14.16.2.1	Other then teak wood beams	Cum	64046.00
14.16.2.2	Hollock wood beams	Cum	41043.00
14.16.2.3	Labour rate for Item No. 14.16.1 to 14.16.2.2	Cum	3300.00
14.17	Raking out joints in lime or cement mortar and preparing the surface for re-pointing or replastering including disposal of rubbish to the dumping ground within 50 meters lead.	Sqm	14.00
14.18	Flush pointing with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement for flat tile bricks on top of mud phaska :		
14.18.1	With Chimney brick tiles	Sqm	33.00
14.18.2	With modular brick tiles	Sqm	34.00
14.18.3	Labour rate for Item No. 14.18.1 to 14.18.2	Sqm	22.00
14.19	Taking out wind ties from roof including cutting out rusted bolts, nuts etc. and removing materials to any distance within compound and stacking.	Kg.	1.00
14.20	Fixing of old wind tie with new fittings including painting two or more coats with anticorrosive bitumastic paint of approved brand & manufacturer over and including priming coat of ready mixed zinc chromate yellow primer of approved brand.	meter	51.00
14.20.1	Labour rate for Item No. 14.20	meter	10.00
14.21	Supply and replacing bottom rail of collapsible gate including making good all damages and applying priming coat of zinc chromate yellow primer of approved brand and manufacturer.	Kg	103.00
14.21.1	Labour rate for Item No. 14.21	Kg	22.00
14.22	Supply and replacing wrought iron or M.S. Wheel or roller of old steel door or gate and fitting and fixing the same with necessary clamps, nuts and bolts/welding and erection etc. complete.		
14.22.1	Wheel 50 mm dia. and below.	per wheel	110.00
14.22.2	Wheel above 50 mm dia.	per wheel	160.00
14.22.3	Labour rate for Item No. 14.22.1	per wheel	12.00
14.22.4	Labour rate for Item No. 14.22.2	per wheel	13.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.23	Pumping out water caused by springs, tidal or river seepage, broken water mains or drains and the like (removal of flush if required will be payable extra).	kilo liter	13.00
14.24	Mud mortar	Cum	231.00
14.25	Brick work with open bhtta bricks of class designation 25 in mud mortar.	Cum	2368.00
14.25.1	Labour rate for Item No. 14.25	Cum	472.00
14.26	Providing and fixing 25 mm thick shutters for cup board etc. :		
14.26.1	Panelled or panelled & glazed shutters of :		
14.26.1.1	Superior class teak wood including nickel plated bright finished M.S. piano hinges with necessary screws.	Sqm	3087.00
14.26.1.2	1st class teak wood including nickel plated bright finished M.S. piano hinges with necessary screws.	Sqm	2331.00
14.26.2	Glazed shutters of :		
14.26.2.1	Superior class teak wood including nickel plated bright finished M.S. piano hinges with necessary screws.	Sqm	3265.00
14.26.2.2	1st class teak wood including nickel plated bright finished M.S. piano hinges with necessary screws.	Sqm	2452.00
14.27	Providing and fixing plain jaffri door and window shutters including bright or/and black enamelled M.S. butt hinges with necessary screws 35x10mm laths placed 35mm apart (frames to be paid separately) including fixing 50x12mm beading complete .		
14.27.1	Second class teak wood.	Sqm	2565.00
14.28	Providing and fixing curtain rods of 1.25mm thick brass plates with two brass brackets fixed with brass screws and wooden plugs etc. wherever necessary complete.		
14.28.1	20 mm diameter.(18 gauge)	meter	218.00
14.28.2	25 mm diameter. (18 gauge)	meter	276.00
14.29	Providing and fixing M.S. round or square bars with M.S. flats at required spacing in wooden frames of windows and clerestory windows.	Kg	61.00
14.30	Providing joists (karries) including hoisting fixing in position and applying wood preservative on unexposed surface etc. complete with:		
14.30.1	Other then teak wood.	Cum	61421.00
14.30.2	Hollock wood.	cum	38675.00
14.31	Providing and fixing bright finished brass single acting spring hinges with necessary screws etc. complete :		
14.31.1	150mm	Each	307.00
14.31.2	125mm	Each	247.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.31.3	100mm	Each	172.00
14.32	Providing and fixing bright finished brass double acting spring hinges with necessary screws etc. complete :		
14.32.1	150mm	Each	471.00
14.32.2	125mm	Each	329.00
14.32.3	100mm	Each	264.00
14.33	Providing and fixing bright finished brass flush bolts with necessary screws etc. complete :		
14.33.1	250mm	Each	129.00
14.33.2	150mm	Each	101.00
14.33.3	100mm	Each	72.00
14.34	Providing and fixing 150 mm bright finished floor brass door stopper with rubber cushion, screws etc. to suit shutter thickness complete.	Each	163.00
14.35	Providing and fixing bright finished brass hard drawn hooks and eyes :		
14.35.1	300mm	Each	70.00
14.35.2	250mm	Each	65.00
14.35.3	200mm	Each	60.00
14.35.4	150mm	Each	56.00
14.35.5	100mm	Each	46.00
14.36	Providing and fixing bright finished brass fan light pivot with necessary screws etc. complete.	Each	26.00
14.37	Providing and fixing 300 mm long bright finished brass chain with hook for fan light including necessary screws etc. complete.	Each	26.00
14.38	Providing and fixing bright finished brass quadrant stay 300mm long with necessary screws etc. complete.	Each	115.00
14.39	Providing and fixing bright finished brass helical door spring (superior quality).	Each	297.00
14.40	Providing and fixing chromium plated brass butt hinges with necessary screws etc. complete.		
14.40.1	125x70x4 mm (ordinary type)	Each	103.00
14.40.2	100x70x4 mm (ordinary type)	Each	86.00
14.40.3	75x65x4 mm (heavy type)	Each	86.00
14.40.4	75x40x2.5 mm (ordinary type)	Each	38.00
14.40.5	50x40x2.5 mm (ordinary type)	Each	24.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.41	Providing and fixing 85x42mm chromium plated brass pull bolt lock with necessary screws, nuts, bolts and washers etc. complete.	Each	200.00
14.42	White washing with lime to give an even shade :		
14.42.1	Old work (two or more coats)	Sqm	5.00
14.42.2	Old work (one or more coats)	Sqm	3.00
14.43	Removing white or colour wash by scrapping and sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete	Sqm	4.00
14.44	Distempering with dry distemper of approved brand and manufacture (one or more coats) and of required shade on old work to give an even shade.	Sqm	13.00
14.44.1	Labour rate for Item No. 14.44	Sqm	11.00
14.45	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade :		
14.45.1	Old work (one or more coats)	Sqm	18.00
14.45.2	Labour rate for Item No. 14.45.1	Sqm	11.00
14.46	Removing dry or oil bound distemper, water proofing cement paint and the like by scrapping, sand papering and preparing the surface smooth including necessary repairs to scratches etc. complete.	Sqm	5.00
14.46.1	Labour rate for Item No. 14.46.1	Sqm	4.00
14.47	Painting on G.S. sheet with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :		
14.47.1	Old work (one or more coats)	Sqm	24.00
14.47.2	Labour rate for Item No. 14.47.1	Sqm	15.00
14.48	Painting (two or more coats) on rain water, soil, waste and vent pipes and fittings with black anticorrosive bitumastic paint of approved brand and manufacture over and including a priming coat of ready mixed zinc chromate yellow primer on new work :		
14.48.1	75 mm diameter pipes	meter	15.00
14.48.2	Labour rate for Item No. 14.48.1	meter	8.00
14.49	Painting (one or more coats) on rain water, soil, waste and vent pipes and fittings with black anticorrosive bitumastic paint of approved brand and manufacture on old work :		
14.49.1	75 mm diameter pipes	meter	7.00
14.49.2	Labour rate for Item No. 14.49.1	meter	4.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.50	Painting (two or more coats) on rain water, soil, waste and vent pipes and fittings with aluminium paint of approved brand and manufacture over a priming coat of ready mixed zinc chromate yellow primer on new work :		
14.50.1	75 mm diameter pipes	meter	17.00
14.50.2	Labour rate for Item No. 14.50.1	meter	8.00
14.51	Painting (one or more coats) on rain water, soil, waste and vent pipes and fittings with synthetic enamel paint of approved brand and manufacture and required colour on old work :		
14.51.1	75 mm diameter pipes	meter	8.00
14.51.2	100 mm diameter pipes	meter	11.00
14.51.3	150 mm diameter pipes	meter	15.00
14.51.4	Labour rate for Item No. 14.51.1	meter	4.00
14.51.5	Labour rate for Item No. 14.51.2	meter	5.00
14.51.6	Labour rate for Item No. 14.51.3	meter	7.00
14.52	Painting with oil type wood preservative of approved brand and manufacture :		
14.52.1	Old work (one or more coats)	Sqm	12.00
14.52.2	Labour rate for Item No. 14.52.1	Sqm	5.00
14.53	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade :		
14.53.1	One or more coats on old work.	Sqm	34.00
14.53.2	Labour rate for Item No. 14.53.1	Sqm	15.00
14.54	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :		
14.54.1	One or more coats on old work.	Sqm	29.00
14.54.2	Labour rate for Item No. 14.54.1	Sqm	15.00
14.55	Painting with aluminium paint of approved brand and manufacture to give an even shade :		
14.55.1	One or more coats on old work.	Sqm	27.00
14.55.2	Labour rate for Item No. 14.55.1	Sqm	15.00
14.56	Painting with acid proof paint of approved brand and manufacture of required colour to give an even shade :		
14.56.1	One or more coats on old work.	Sqm	34.00
14.56.2	Labour rate for Item No. 14.56.1	Sqm	15.00
14.57	Painting with black anti-corrosive bitumastic paint of approved brand and manufacture to give an even shade :		
14.57.1	One or more coats on old work.	Sqm	23.00
14.57.2	Labour rate for Item No. 14.57.1	Sqm	15.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.58	French spirit polishing :		
14.58.1	One or more coats on old work.	Sqm	50.00
14.58.2	Labour rate for Item No. 14.58.1	Sqm	38.00
14.59	Polishing on wood work with ready made wax polish of approved brand and manufacture :		
14.59.1	Old work	Sqm	24.00
14.59.2	Labour rate for Item No. 14.59.1	Sqm	17.00
14.60	Re-lettering with black Japan paint of approved brand and manufacture.	Per letter per cm height	1.00
14.61	Painting (one or more coats) with black Japan paint of approved brand and manufacture to give an even shade.	Sqm	23.00
14.62	Providing and fixing C.P. brass chain and rubber plug complete for sink or wash basin :		
14.62.1	32mm dia	Each	53.00
14.62.2	40mm dia	Each	42.00
14.63	Distempering with 1st quality acrylic washable distemper (ready made) of approved manufacturer and of required shade and colour complete. as per manufacturer's specification.		
14.63.1	One or more coats on old work.	Sqm	17.00
14.63.2	Labour rate for Item No. 14.63.1	Sqm	9.00
14.64	Finishing walls with water proofing cement paint of required shade		
14.64.1	Old work (one or more coats applied @ 2.20 kg/10 sqm) over priming coat of primer applied @ 0.80 litrs/10 sqm complete including cost of Priming coat.	Sqm	34.00
14.64.2	Labour rate for Item No. 14.64.1	Sqm	16.00
14.65	Finishing walls with textured exterior paint of required shade :		
14.65.1	Old work (Two or more coats on existing cement paint surface applied @ 3.28 ltr/10 sqm.	Sqm	109.00
14.65.2	Old work (One or more coats) applied @ 1.82 ltr/10 sqm.	Sqm	64.00
14.65.3	Labour rate for Item No. 14.65.1	Sqm	15.00
14.65.4	Labour rate for Item No. 14.65.2	Sqm	11.00
14.66	Finishing walls with Acrylic Smooth exterior paint of required shade		
14.66.1	Old work (Two or more coat applied @ 1.67 ltr/ 10 sqm) on existing cement paint surface).	Sqm	47.00
14.66.2	Old work (One or more coat applied @ 0.90 ltr/10 sqm).	Sqm	29.00
14.66.3	Labour rate for Item No. 14.66.1	Sqm	15.00
14.66.4	Labour rate for Item No. 14.66.2	Sqm	11.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
14.67	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade		
14.67.1	Old work (Two or more coats applied @ 1.43 ltr/ 10 sqm) over existing cement paint surface.	Sqm	60.00
14.67.2	Old work (one or more coats applied @ 0.83 ltr/10 sqm).	Sqm	38.00
14.67.3	Labour rate for Item No. 14.67.1	Sqm	15.00
14.67.4	Labour rate for Item No. 14.67.2	Sqm	11.00
14.68	Painting (one or more coats) on rain water, soil, waste and vent pipes and fittings with black anticorrosive bitumastic paint approved brand and manufacture on old work :		
14.68.1	100 mm diameter pipes	Meter	9.00
14.68.2	150 mm diameter pipes	Meter	13.00
14.68.3	Labour rate for Item No. 14.68.1	Meter	5.00
14.68.4	Labour rate for Item No. 14.68.2	Meter	7.00
14.69	Varnishing with varnish of approved brand and manufacture:		
14.69.1	One or more coats with copal varnish.	Sqm	26.00
14.69.2	One or more coats with spar varnish.	Sqm	28.00
14.69.3	Labour rate for Item No. 14.69.1 to 14.69.2	Sqm	15.00
14.70	Melamine polishing on wood work (one or more coat).	Sqm	60.00
14.70.1	Labour rate for Item No. 14.70	Sqm	15.00
14.71	Varnishing with flatting varnish of approved brand and manufacture one or more coats on old work.	Sqm	27.00
14.71.1	Labour rate for Item No. 14.71	Sqm	15.00
14.72	Making hole in 15 cm dia RCC/RBC of thickness upto 15 cm including the charges of equipments.	Each	69.00
14.73	Making hole in 10 cm dia RCC/RBC of thickness upto 15 cm including the charges of equipments.	Each	50.00
14.74	Cleanning of deposited dust and mud etc. from RCC roof and cleanning the void , crackes by wire brush.	Sqm	12.00
14.75	Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete in R.C.C. roof after cleaning the roof.	Kg	1147.00
14.76	Providing and Applying 10mm thick (Average) epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete in roof.	sqm	818.00

15.00 DISMANTLING AND DEMOLISHING

Notes

IS 1200 (Pt-XVIII) Method of Measurements of Building and Civil Engineering Works (Part - XVIII) Demolition and Dismantling

IS 4130 Demolition of Buildings-Code of Safety

1 In dismantling, the articles shall be carefull 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.

2 All dismantled materials shall form the Government property.

3 During dismantling, every precaution shall be taken to prevent damage to any part of strucutre and also to any adjoining structure, which are to be left intact.

4 The rates are applicable to all types Buildings.

5 An inventory of all possbile 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.

6 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 otehrwise provided, excavated materials shall be used in back filling the execavation made in removing the structure in levelling ground or otherwise disposed off as directed with in specified lead.

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

7 Measurements

(i) Measurement of all works shall be recorded before dismantling.

(ii) All measurements shall be measured along the existing slopes.

8 Rates :-

The rate include the cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable material properly and disposing off unserviceable material within a distance of 50 meters.

The rates also include for temporary shoring for the safety of portions not required to be pulled down, or of adjoining property, and providing temporary enclosures or partitions, where considered necessary.

(For Detail Refer Chapter of Dismantling and Demolishing specification)

15.00 DISMANTLING AND DEMOLISHING			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
15.1	Demolishing lime concrete manually / by mechanical means and disposal of material within 50 meters lead as per direction of Engineer in charge.	Cum	166.00
15.2	Demolishing cement concrete manually/by mechanical means including disposal of material within 50 meters lead as per direction of Engineer-in-charge.		
15.2.1	1:3:6 or richer mix	Cum	475.00
15.2.2	1:4:8 or leaner mix	Cum	293.00
15.3	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 meters lead as per direction of Engineer-in-	Cum	694.00
15.4	Demolishing R.B. work manually/by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 meters lead as per direction of Engineer-in- charge.	Cum	620.00
15.5	Extra for cutting reinforcement bars manually/by mechanical means in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work) as per direction of Engineer -in-charge.	Sqm	222.50
15.6	Extra for scrapping, cleaning and straightening reinforcement from R.C.C. or R.B. work	Kg	2.00
15.7	Demolishing brick work manually/by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 meters lead as per direction of Engineer-in-		
15.7.1	In mud mortar	Cum	137.00
15.7.2	In lime mortar with old mughal bricks	Cum	347.00
15.7.3	In lime mortar	Cum	166.00
15.7.4	In cement mortar	Cum	401.00
15.8	Removing mortar from bricks and cleaning bricks including stacking within a lead of 50m (stacks of cleaned bricks shall be measured):		
15.8.1	From brick work in mud mortar	1000 nos	899.00
15.8.2	From brick work in lime mortar	1000 Nos	1032.00
15.8.3	From brick work in cement mortar	1000 Nos	1285.00
15.9	Demolishing stone rubble masonry manually/by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50meters lead as per direction of Engineer-in-charge:		
15.9.1	In lime mortar	Cum	226.00
15.9.2	In cement mortar	Cum	479.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
15.10	Dismantling dressed stone work ashlar face stone work, marble work or precast concrete work manually/ by mechanical means including stacking of serviceable and disposal of unserviceable material within 50 meters lead as per direction of Engineer-in-charge:		
15.10.1	In lime mortar	Cum	286.00
15.10.2	In cement mortar	Cum	560.00
15.11	Removing mortar from and cleaning stones and concrete articles (net quantity of stacks of cleaned materials will be measured) :		
15.11.1	In lime mortar	Cum	92.00
15.11.2	In cement mortar	Cum	134.00
15.12	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and stacking within 50 meters lead.		
15.12.1	Of area 3 sq. meters and below	Each	69.00
15.12.2	Of area beyond 3 sq. meters	Each	96.00
15.13	Taking out doors, windows and clerestory window shutters (steel or wood) including stacking within 50 meters lead:		
15.13.1	Of area 3 sq. meters and below	Each	27.00
15.13.2	Of area beyond 3 sq. meters	Each	36.00
15.14	Dismantling wood work in frames, trusses, purlins and rafters upto 10 meters span and 5 meters height including stacking the material within 50 meters lead:		
15.14.1	Of sectional area 40 square centimeters and above.	Cum	841.00
15.14.2	Of sectional area below 40 square centimeters.	meter	3.00
15.15	Extra for dismantling trusses, rafters, purlins etc. of wood work for every additional span of one meter or part thereof beyond 10 meters :		
15.15.1	Of sectional area 40 square centimeters and above.	Cum per meter span	119.00
15.15.2	Of sectional area below 40 square centimeters.	Meter Per mtr. Span	0.30
15.16	Extra for dismantling trusses, rafters, purlins etc. of wood work for every additional height of one meter or part thereof beyond 5 meters :		
15.16.1	Of sectional area 40 square centimeters and above.	Cum per meter height	170.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
15.16.2	Of sectional area below 40 square centimeters.	meter per meter height	1.00
15.17	Dismantling steel work in single sections including dismembering and stacking within 50 meters lead in:		
15.17.1	R.S. Joists	quintal	65.00
15.17.2	Channels, angles, tees and flats	quintal	46.00
15.18	Dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates,bolts,nuts,cutting rivets,welding etc. including dismembering and stacking within 50meters lead.	Kg	1.00
15.19	Dismantling steel work manually/ by mechanical means in built up sections without dismembering and stacking within 50 meters lead as per direction of Engineer-in-charge.	Kg	1.00
15.20	Extra for dismantling trusses, rafters, purlins etc. of steel work for every additional span of one meter or part thereof beyond 10 meters	quintal	17.00
15.21	Extra for dismantling trusses, rafters, purlins etc. of steel work for every additional height of one meter or part thereof beyond 5 meters.	quintal	17.00
15.22	Extra for marking of structural steel work required to be re-erected.	Kg.	1.00
15.23	Dismantling tile work in floors and roofs laid in cement mortar including stacking material within 50 meters lead.		
15.23.1	For thickness of tiles upto 25 mm	Sqm	18.00
15.23.2	For thickness of tiles above 25 mm and up to 40 mm	Sqm	21.00
15.24	Demolishing dry brick pitching in floors, drains etc. including stacking serviceable material and disposal of unserviceable material within 50 meters lead :	Cum	257.00
15.25	Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 meters lead.	Sqm	52.00
15.26	Demolishing brick tile covering in terracing including stacking of serviceable material and disposal of unserviceable material within 50 meters lead.	Sqm	20.00
15.27	Demolishing mud phaska in terracing and disposal of material within 50 meters lead.	Cum	178.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
15.28	Dismantling roofing including ridges, hips valleys and gutters etc., and stacking the material within 50 meters lead of:		
15.28.1	G.S. Sheet	Sqm	32.00
15.28.2	Asbestos sheet	Sqm	15.00
15.29	Dismantling stone slab roofing over wooden karries or R.C.C. battens (dismantling karries and battens to be paid for separately) including stacking of serviceable material and disposal of unserviceable material within 50 meters lead.	Sqm	522.00
15.30	Dismantling jack arch roofing and floors including stacking of serviceable material and disposal of unserviceable material within 50 meters lead.	Sqm	50.00
15.31	Dismantling tiled roofing with battens boarding etc. complete including stacking of serviceable material and disposal of unserviceable material within 50 meters lead.	Sqm	41.00
15.32	Demolishing thatch roofing including mats, bamboo, jaffari etc. complete including stacking of serviceable material and disposal of unserviceable material within 50 meters lead.	Sqm	11.00
15.33	Dismantling wooden ballies in posts and struts including stacking within 50 meters lead.	meter	4.00
15.34	Dismantling and stacking within 50meters lead,fencing posts or struts including all earth work and dismantling of concrete etc.in base of:		
15.34.1	T' or 'L' iron or pipe	Each	54.00
15.34.2	R.C.C.	Each	62.00
15.35	Cutting ballies or wooden posts of fencing at the point of projection above the concrete or ground and stacking the same within 50 meters lead.	Each	5.00
15.36	Dismantling barbed wire or flexible wire rope in fencing including making rolls and stacking within 50 meters lead.	Kg	7.00
15.37	Dismantling wooden trellis work excluding frames but including stacking the serviceable material within 50 meters lead.	Sqm	13.00
15.38	Dismantling expanded metal or I.R.C. fabrics with necessary battens and beading including stacking the serviceable material within 50 meters lead.	Sqm	15.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
15.39	Dismantling wooden boardings in lining of walls and partitions, excluding supporting members but including stacking within 50 meters lead :		
15.39.1	Up to 10 mm thick	Sqm	12.00
15.39.2	Thickness above 10 mm up to 25 mm	Sqm	15.00
15.39.3	Thickness above 25 mm up to 40 mm	Sqm	18.00
15.40	Dismantling precast concrete or stone slabs in walls, partition walls etc. including stacking within 50 meters lead:		
15.40.1	Thickness up to 40 mm	Sqm	57.00
15.40.2	Thickness above 40 mm up to 75 mm	Sqm	85.00
15.41	Dismantling cement asbestos or other hard board ceiling or partition walls including stacking of serviceable materials and disposal of unserviceable materials within 50 meters lead.	Sqm	11.00
15.42	Dismantling C.I. or asbestos rain water pipe with fittings and clamps including stacking the material within 50 meters lead :		
15.42.1	75 to 80 mm dia pipe.	meter	15.00
15.42.2	100 mm dia pipe	meter	15.00
15.42.3	150 mm dia pipe	meter	16.00
15.43	Dismantling manually/by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50meters lead as per direction of Engineer-in-charge :		
15.43.1	Water bound macadam road	Sqm	44.00
15.43.2	bituminous road	Sqm	85.00
15.44	Dismantling G.I. pipes (external work) including excavation and refilling trenches after taking out the pipes, manually/ by mechanical means including stacking of pipes within 50 meters lead as per direction of Engineer-in-charge :		
15.44.1	Upto 40 mm nominal bore	meter	31.00
15.44.2	Above 40 mm nominal bore	meter	35.00
15.45	Dismantling C.I. pipes including excavation and refilling trenches after taking out the pipes, manually/ by mechanical means breaking lead caulked joints, melting of lead and making into blocks including stacking of pipes, lead at site within 50 meter lead as per direction of Engineer- in-charge:		
15.45.1	Up to 150 mm diameter	meter	84.00
15.45.2	Above 150 mm dia up to 300 mm dia.	meter	113.00
15.45.3	Above 300 mm diameter	meter	152.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
15.46	Dismantling steel cylinder R.C. pipes including excavation and refilling trenches after taking out the pipes, manually/ by mechanical means breaking lead caulked joints, melting of lead and making into blocks including stacking of pipes, lead at site within 50 meters lead as per direction of Engineer-in-charge:		
15.46.1	Up to 600 mm diameter	meter	152.00
15.46.2	Above 600 mm diameter	meter	373.00
15.47	Dismantling asbestos cement pressure pipes including excavation and refilling trenches after taking out the pipes manually/ by mechanical means and stacking the pipes within 50 meters lead as per direction of Engineer-in-charge:		
15.47.1	Up to 150 mm diameter	meter	64.00
15.47.2	Above 150 mm diameter	meter	78.00
15.48	Taking out C.I. cover with frame from R.C.C. top slab of manholes of various sizes including demolishing of R.C.C. work manually/ by mechanical means and stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 meters lead as per direction of Engineer-in-charge.	Each	140.00
15.49	Taking out C.I. cover with frame from R.C.C. top slab of inspection chambers of various sizes including demolishing of R.C.C. work manually/ by mechanical means and stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 meters lead as per direction of Engineer-in-charge.	Each	83.00
15.50	Dismantling of R.C.C. spun vent shaft including excavating the cement concrete pit completely, taking out the shaft, refilling the excavated gap, stacking the useful materials near the site and disposal of unserviceable materials within 50 meters lead	Each	895.00
15.51	Dismantling of road gully chamber of various sizes including C.I. grating with frame including stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 meters lead including refilling the excavated gap.	Each	191.00
15.52	Dismantling of flushing cistern of any size including stacking of useful materials near the site and disposal of unserviceable materials within 50 meters lead.	Each	178.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
15.53	Dismantling of C.I. sluice valve including stacking of useful materials within a lead of 50 meters		
15.53.1	Up to 150 mm diameter	Each	65.00
15.53.2	Above 150 mm diameter	Each	225.00
15.54	Dismantling of spindle fire hydrant including stacking of useful materials within 50 meters lead.	Each	135.00
15.55	Dismantling of cement concrete platform along with curtain walls and base concrete etc. including stacking of useful materials near the site and disposal of unserviceable materials within 50 meters lead		
15.55.1	120 x 120 cm (outside to outside)	Each	215.00
15.55.2	210 x 120 cm (outside to outside)	Each	330.00
15.55.3	320 x 120 cm (outside to outside)	Each	467.00
15.56	Dismantling old plaster or skirting upto 15 mm thickness, raking out joints and cleaning the surface for plaster upto two floor level including disposal of rubbish within 50 meters lead and including scaffolding etc.	Sqm	13.00
15.57	Dismantling aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material and stacking of serviceable material with in 50 meters lead as directed by Engineer-in-charge.	Sqm	11.00
15.58	Demolishing C.C/R.C.C. work by mechanical means and stockpiling at designated locations and disposal of dismantled materials up to a lead of 1000m,stacking serviceable and unserviceable material separately including cutting reinforcement bars.	Cum	810.00
15.59	Dismantling of flexible pavement (bituminous courses) by mechanical means and disposal of dismantled material up to a lead of 1000 meters, as per direction of Engineer-in-charge.	Cum	109.00

16.00 PILE WORK

Notes for Specification :-

IS Codes

Bentonite shall be as per IS 2720 (Part V).

Pile boring equipments shall be IS 14362.

Design and Construction of pile foundation (Driven cast-in-situ piles) shall be as per IS-2911 (Part 1/Sec. 1)

Design and Construction of pile foundation (Bored Cast-in-situ piles) shall be as per IS-2911 (Part 1/Sec. 2)

Design and Construction of pile foundation (Driven pre-cast concrete piles) shall be as per IS-2911 (Part 1/Sec. 3)

Design and Construction of pile foundation (Bored pre-cast concrete piles) shall be as per IS-2911 (Part 1/Sec. 4)

Design and Construction of pile foundation (Under reamed piles) shall be as per IS-2911 (Part 3)

Design and Construction of pile foundation Load test on piles shall be as per IS 2911 (Part-4)

1 **Load** :- It is load which is applied to a pile after taking into account its ultimate load capacity pile spacing, Overall bearing capacity of the ground, the allowable settlement, negative skin friction including reversal of loads.

2 **Bearing Pile** :- A pile formed in the ground for transmitting load of a structure to the soil by the resistance developed at its tips and or along its surface. It is either vertical of batter pile. It may be 'End bearing pile' or friction pile if it suports the load primarily along the surfaces.

3 **Cast-in-situ** :- Cast-in-situ piles shall be installed by driving a metal casing with a shoe at the tip and displacing the material laterally. Driven cast-in-situ pile is formed by driving a casing, permanent or temporary and subsequently filling the hole with plain or reinforcement concrete.

4 **Installation of Piles** : Installation of piles shall be as accurate as possible and as per design and drawings. The vertically or the required batter should be correctly maintained. Particular care shall be taken in respect of installing either single pile or piles in two pile groups.

5 **Curing** :- As per IS 456 - 2000, exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer of sacking, canvas, Hessian or similar materials and kept constantly wet for a least 10 days from the date of placing concrete. The period of curing shall not be less than 14 days for concrete exposed to dry and hot weather conditions.

6 **Measurement**

6.1 Dimension shall be measured nearest to a cm. Measurement of length on completion shall be along the axis of pile and shall be measured from to of shoe to the bottom of pile cap.

7 **Rates**:

The rate includes the cost of materials and labour involved in all the operations described above including pile embedded in pile cap, except soil investigation, reinforcement, pile cap and grade beam.

(For Detail Refer Chapter of Pile work specification)

16.00 PILE WORK			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
16.1	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) :		
16.1.1	400 mm dia piles	meter	1621.00
16.1.2	450 mm dia piles	meter	1988.00
16.1.3	500 mm dia piles	meter	2391.00
16.1.4	550 mm dia piles	meter	2603.00
16.1.5	750 mm dia piles.	meter	4393.00
16.1.6	1000 mm dia piles.	meter	7237.00
16.1.7	1200 mm dia piles.	meter	9374.00
16.1.8	1500 mm dia piles.	meter	13224.00
16.2	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).		
16.2.1	300 mm dia piles	meter	1176.00
16.2.2	400 mm dia piles	meter	1474.00
16.2.3	450 mm dia piles	meter	1919.00
16.2.4	500 mm dia piles	meter	2274.00
16.2.5	600 mm dia piles	meter	3001.00
16.2.6	750 mm dia piles.	meter	4337.00
16.2.7	1000 mm dia piles.	meter	7198.00
16.2.8	1200 mm dia piles.	meter	9383.00
16.2.9	1500 mm dia piles.	meter	13357.00
16.3	Boring, Providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in M 35 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 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) :		
16.3.1	300 mm dia piles	meter	1737.00
16.3.2	400 mm dia piles	meter	2138.00
16.3.3	450 mm dia piles	meter	2377.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
16.3.4	550 mm dia piles	meter	2649.00
16.4	Extra over item No. 16.3 for providing additional bulb in under reamed piles, under specified diameter (Only the quantity of extra bulbs are to be paid).		
16.4.1	300 mm dia piles	Each	1120.00
16.4.2	400 mm dia piles	Each	1296.00
16.4.3	450 mm dia piles	Each	1402.00
16.4.4	550 mm dia piles	Each	1571.00
16.5	Providing,driving and installing driven Pre-cast reinforced cement concrete piles of specified diameter and length below the pile cap in M 35 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 for grouting 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 reinforcement. (Length of pile for payment shall be measured from top of the shoe to the bottom of pile cap).		
16.5.1	400 mm dia piles.	meter	1838.00
16.5.2	450 mm dia piles.	meter	2147.00
16.5.3	500 mm dia piles.	meter	2317.00
16.5.4	550 mm dia piles.	meter	2610.00
16.5.5	750 mm dia piles.	meter	3911.00
16.5.6	1000 mm dia piles.	meter	6165.00
16.6	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.		
16.6.1	Single pile upto 50 tonne capacity		
16.6.1.1	Initial test.	per test	32388.00
16.6.1.2	Routine test	per test	22039.00
16.6.2	Single pile above 50 tonne and upto 100 tonne capacity		
16.6.2.1	Initial test.	per test	41843.00
16.6.2.2	Routine test	per test	24838.00
16.6.3	Group of two or more piles upto 50 tonne capacity		
16.6.3.1	Initial test.	per test	51745.00
16.6.3.2	Routine test	per test	31737.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
16.7	Cyclic vertical load testing of pile in accordance with IS Code of practice IS: 2911(part IV) including preparation of pile head etc for.		
16.7.1	Single pile.		
16.7.1.1	Upto 50 tonne capacity pile.	per test	22039.00
16.7.1.2	Above 50 tonne and upto 100 tonne capacity pile.	per test	24838.00
16.7.2	Group of two piles.		
16.7.2.1	Upto 50 tonne capacity each.	per test	31737.00
16.8	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 :		
16.8.1	Upto 50 tonne capacity pile.	per test	22039.00
16.8.2	Above 50 tonne and upto 100 tonne capacity pile.	per test	31813.00
16.9	Boring, providing and installing bored cast-in-situ reinforced cement concrete pile of specified diameter and length below the pile cap M 20 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).		
16.9.1	300 mm dia piles	meter	1165.00
16.9.2	400 mm dia piles	meter	1455.00
16.9.3	450 mm dia piles	meter	1895.00
16.9.4	500 mm dia piles	meter	2244.00
16.9.5	600 mm dia piles	meter	2958.00
16.9.6	750 mm dia piles.	meter	4269.00
16.9.7	1000 mm dia piles.	meter	7079.00
16.9.8	1200 mm dia piles.	meter	9211.00
16.9.9	1500 mm dia piles.	meter	13088.00
16.10	Deduct for casing pipe and bentonite solution in 16.2 and 16.9.		
16.10.1	300 mm dia piles	meter	146.00
16.10.2	400 mm dia piles	meter	149.00
16.10.3	450 mm dia piles	meter	165.00
16.10.4	500 mm dia piles	meter	174.00
16.10.5	600 mm dia piles	meter	190.00
16.10.6	750 mm dia piles.	meter	343.00
16.10.7	1000 mm dia piles.	meter	545.00
16.10.8	1200 mm dia piles.	meter	641.00
16.10.9	1500 mm dia piles.	meter	746.00

17.00 ALUMINIUM WORK

Notes:

1 Aluminium sections used for fixed/openable windows, ventilators, partitions, frame work & doors etc. shall be suitable for use to meet architectural designs to relevant works and shall be subject to approval of the Engineer-in-Charge for technical, structural, functional and visual considerations.

2 The aluminium extruded sections shall conform to IS 733 : 2008 and IS 1285 for chemical composition and mechanical properties. The stainless steel screws shall be of grade AISI 304.

3 The permissible dismensional tolerances of the extruded sections shall be as per IS 6477 and shall be such as not to impair the proper and smooth functioning / operation and appearance of door and windows.

4 Aluminium sheets for use as kick panels shall be 1.25 mm thick aluminium alloy sheet as per IS 1948 and sheet shall be as per IS 737 : 2008.

5 Aluminium alloy sheet for use in general paneling work shall be of types and thickness as specified and conforming to the requirement of IS 737 : 2008.

6 Aluminium sheets shall be of approved make and manufacturer. Aluminium panel may be prefabricated units manufactured on modular or non-modular dimension.

7 The float glass that conform to the IS 14900 : 2000.

8 Flate transparent sheet glass shall be as per IS 2835.

Prelaminated Particle Boards shall be as per IS 12823 :1990.

9 DOOR, WINDOW, VENTILATOR AND PARTITION FRAMES

(i) The holes in concrete/mansory/wood/any other members for fixing anchor bolts/fasteners/screws shall be drilled with an appropriate electric drill.

(ii) The fabrication of the individual door/windows/ventilators etc. shall be done as per the actual sizes of the opening left at site.

(iii) The frames shall be trully rectangular and flat with regular shape corners fabricated to true right angles.

(iv) The assembled composite units shall be checked for line, level and plumb before final fixing is done.

(v) Where aluminium comes into contact with stone masonry, brick work, concrete, plaster or dissimilar metal, it shall be coated with an approved insulation lacquer, paint or plastic tape to ensure that electrochemical corrosion is avoided.

10 DOOR, WINDOW, VENTILATOR AND SHUTTERS

Manufacured from extruded aluminium alloy sections of standard sizes and designs complete with fittings, shall be as per IS 1948.

11 **Hydraulic Floor Spring**

The hydraulic floor spring shall be heavy duty double action floor spring of make approved by the Engineer-in-Charge suitable for door leaf of weight minimum 100 kg. The top cover plate shall be of stainless steel, flushing with floor finish level. The contractor shall cut the floor properly with stone cutting machine to exact size & shape. The spindle of suitable length to accommodate the floor finish shall be used. The contractor shall give the guarantee duly supported by the company for proper functioning of floor spring at least for 10 years

12 Measurements

(i) All the aluminium sections including snap beading fixed in place shall be measured in running meter along the outer periphery of composite section correct to a milimeter. The weight calculated on the basis of actual average (average of five samples) weight of composite section in kilogram correct to the second place of decimal shall be taken for payment. (Weight shall be taken after anodizing). The weight of cleat shall be added for payment. Neither any deduction nor anything extra shall be paid for skew cuts.

(ii) The height and width of double glazed/single glazed unit (the area of glass unit outside the snap beading shall only be measured) as fixed in place shall be measured correct to one centimeter and area calculated in sqm. Correct to second place of decimal shall be taken for payment.

13 Rates

The rates include the cost of all the materials, labours involved in all the operations as described in nomenclature of item and particular specification.

(For Detail Refer Chapter of Aluminium Work specification)

17.00 ALUMINIUM WORK			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
17.1	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/neoprene felt etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing and paneling to be paid for separately) :		
17.1.1	For fixed portion		
17.1.1.1	Anodised aluminium(anodised transparent or dyed to required shade according to IS:1868,Minimum anodic coating of grade AC15)	Kg	347.00
17.1.1.2	Powder coated aluminium (minimum thickness of powder coating 50 micron)	Kg	366.00
17.1.1.3	Polyester powder coated aluminium (minimum thickness of polyester powder coating 50 micron)	Kg	374.00
17.1.1.4	Labour rate for Item No.- 17.1.1.1 to 17.1.1.3	Kg	10.00
17.1.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of PVC / neoprene gasket required (Fittings shall be paid for separately).		
17.1.2.1	Anodised aluminium(anodised transparent or dyed to required shade according to IS:1868,Minimum anodic coating of grade AC15)	Kg	369.00
17.1.2.2	Powder coated aluminium (minimum thickness of powder coating 50 micron)	Kg	388.00
17.1.2.3	Polyester powder coated aluminium (minimum thickness of polyester powder coating 50 micron)	Kg	396.00
17.1.2.4	Labour rate for Item No.- 17.1.2.1 to 17.1.1.3	Kg	13.00
17.2	Providing and fixing 12mm thick prelaminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade l Type ll, in panelling fixed in aluminum doors, windows shutters and partition frames with C.P. brass / stainless steel screws etc. complete as per architectural drawings and directions of Engineer-in-charge		

S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
17.2.1	Pre-laminated particle board with decorative lamination on one side and balancing lamination on other side.	Sqm	905.00
17.2.2	Pre-laminated particle board with decorative lamination on both sides.	Sqm	941.00
17.2.3	Labour rate for Item No.- 17.2.1 to 17.2.2	Sqm	56.00
17.3	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with PVC/ neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in- charge (Cost of aluminium snap beading shall be paid in basic item):		
17.3.1	With float glass panes of 4.0 mm thickness	Sqm	679.00
17.3.2	With float glass panes of 5.50 mm thickness	Sqm	859.00
17.3.3	With float glass panes of 8 mm thickness	Sqm	1204.00
17.3.4	Labour rate for Item No.- 17.3.1 to 17.3.3	Sqm	95.00
17.4	Providing and fixing double action hydraulic floor spring of approved brand and manufacture IS : 6315 marked, for doors including cost of cutting floors as required, embedding in floors and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge.		
17.4.1	With stainless steel cover plate	Each	1979.00
17.4.2	With brass cover plate	Each	2171.00
17.4.3	Labour rate for Item No.- 17.4.1 to 17.4.2	Each	71.00
17.5	Providing and fixing powder coated aluminium work (minimum thickness of powder coating 50 micron) consisting of tee/ angle sections, of approved make conforming to IS : 733 in frames of false ceiling including aluminium angle cleats with necessary C.P. brass/ stainless steel sunk screws, aluminium perimeter angles fixed to wall with rawl plugs @ 450 mm centre to centre and fixing the frame work to G.I. level adjusting hangers 6 mm dia. with necessary cadmium plated machine screws all complete as per approved architectural drawings and direction of the Engineer-in-charge (level adjusting hangers, ceiling cleats and expansion hold fasteners to be paid for separately).	Kg	440.00
17.5.1	Labour rate for Item No.- 17.5	Kg.	45.00
17.6	Providing and fixing 6 mm dia. G.I. level adjusting hangers (upto 1200mm length) fixed to roof slabs by means of ceiling cleats made out of G.I. flat 40x3mm size 60mm long and expansion hold fasteners 12.5 mm dia. 40mm long complete as per direction of Engineer -in- charge.	Each	89.00
17.6.1	Labour rate for Item No.- 17.6	Each	6.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
17.7	Providing and fixing machine moulded aluminium covering of approved pattern & design, made out of machine cut aluminium sheet and machine holed for receiving screws, over expansion joints on vertical surfaces/ceilings with full threaded, cadmium plated steel screws 4mm dia. stem, 30mm long and aluminium washers 2mm thick, 15mm dia. at a staggered pitch of 200mm centre to centre including drilling holes in the receiving surface and providing expandable plastic sleeves in holes etc. complete.		
17.7.1	Anodised aluminium sheet 2.5mm thick (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15)	Kg	426.00
17.7.2	Powder coated aluminium sheet 2.5mm thick (minimum thickness of powder coating 50 micron)	Kg	444.00
17.7.3	Labour rate for Item No.- 17.7.1 to 17.7.2	Kg	23.00
17.8	Filling the gap in between aluminium frame & adjacent RCC/ Brick/ Stone work by providing weather silicon sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete.	meter	69.00
17.8.1	Labour rate for Item No.- 17.8	Meter	29.00
17.9	Extra for applying additional anodic coating AC 25 instead of AC 15 to aluminium extruded sections		
17.9.1	For fixed portion, shutters of doors, windows & ventilators	Kg	15.00
17.10	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thick clear float glass both side having 12 mm air gap including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specification drawings and direction of Engineer-in-charge complete.	Sqm	3535.00
17.10.1	Labour rate for Item No.- 17.10	Sqm	142.00
17.11	Providing and fixing stainless steel (SS 304 grade) adjustable friction windows stays of approved quality with necessary stainless steel screws etc. to the side hung windows as per direction of Engineer-in- charge complete.		
17.11.1	205 X 19 mm	Each	221.00
17.11.2	255 X 19 mm	Each	244.00
17.11.3	355 X 19 mm	Each	313.00
17.11.4	510 X 19 mm	Each	580.00
17.11.5	710 X 19 mm	Each	1058.00
17.11.6	Labour rate for Item No.- 17.11.1 to 17.11.5	Each	6.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
17.12	Providing and fixing aluminium tubular handle bar 32 mm outer dia, 3.0 mm thick & 2100 mm long with SS screws etc .complete as per direction of Engineer-in-Charge.		
17.12.1	Anodized (AC 15) aluminium tubular handle bar	Each	513.00
17.12.2	Powder coated minimum thickness 50 micron aluminium tubular handle bar.	Each	542.00
17.12.3	Polyester powder coated minimum thickness 50 micron aluminium tubular handle bar	Each	555.00
17.12.4	Labour rate for Item No.- 17.12.1 to 17.12.3	Each	3.00
17.13	Providing and fixing 100mm brass locks (best make of approved quality) for aluminium doors including necessary cutting and making good etc. complete.	Each	297.00
17.13.1	Labour rate for Item No.- 17.13	Each	37.00
17.14	Providing and fixing anodised aluminium (anodised transparent or dyed to required shade according to IS:1868. Minimum anodic coating of grade AC 15) sub frame work for windows and ventilators a with extruded built up standard tubular sections of approved make conforming to IS: 733 and IS :1285 fixed with rawl plugs and stainless steel screws etc.	Kg	378.00
17.14.1	Labour rate for Item No.- 17.14	Kg.	7.00
17.15	Providing fixing aluminium casement windows fastener of required length for aluminium windows with necessary screws etc. complete.		
17.15.1	Anodized (AC 15) aluminium	Each	41.00
17.15.2	Powder coated minimum thickness 50 micron aluminium.	Each	45.00
17.15.3	Polyester powder coated minimum thickness 50 micron aluminium.	Each	48.00
17.15.4	Labour rate for Item No.- 17.15.1 to 17.15.3	Each	1.60
17.16	Providing fixing aluminium round shape handle of outer dia 100mm with SS screws etc. complete as per direction of Engineer-in-charge		
17.16.1	Anodized (AC 15) aluminium	Each	50.00
17.16.2	Powder coated minimum thickness 50 micron aluminium.	Each	55.00
17.16.3	Polyester powder coated minimum thickness 50 micron aluminium.	Each	58.00
17.16.4	Labour rate for Item No.- 17.16.1 to 17.16.3	Each	1.60

18.0 WATER PROOFING

Notes:

1 **Water proofing material shall be ISI mark.**

2 **Following IS Code shall be followed in Water Proofing Works**

(i) Paving Bitumen Specifications IS 73

(ii) Specifications for Industrial Bitumen IS 702

(iii) Specifications for Bitumen felts for Water proofing and Damp proofing IS 1322

(iv) Specifications for Integral Cement Water Proofing compounds IS 2645

(v) Code of Practice for Concrete Structures for the Storage of Liquid : Part -1 General Requirements. IS 3370 (Part-1)

(vi) Specifications for Bitumen Primer for Water Proofing and Damp proofing IS 3384.

(vii) Specification for Glass Fibre Bitumen Felts IS 7193

(viii) Provision of Water Stops at Transfers construction joints in Masonry and concrete Dams - Code of Practice.

(ix) Application for Spray Applied Insulation - Code of Practice Part-3 Polyurethane/ Polyisocyarurate.

3 Various Water proofing treatment have been described in specification and shall be followed.

4 Measurement

Length and breadth shall be measured along the finished surface correct to a cm and the area shall be worked out to nearest 0.01 sqm.

5 Rates

The rate include the cost of all labour & materials involved in all the operations.

(For Detail Refer Chapter of Water Proofing Treatment specification)

18.0 WATER PROOFING			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
18.1	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for under ground structures as directed by Engineer-in-Charge and consisting of : (i) Ist layer of 22mm to 25mm thick approved and specified rough stone slab over a 25mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound conforming to IS:2645 in the recommended proportion over the leveling course (leveling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound. (ii) 2nd layer of 25mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in ecommended proportions. (iii) Finishing top with stone aggregate of 10mm to 12mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.		
18.1.1	Using rough kota stone.	Sqm	753.00
18.1.2	Labour rate for Item No. 18.1.1	Sqm	131.00
18.2	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge :		
18.2.1	Using rough kota stone.	Sqm	879.00
18.2.2	Labour rate for Item No. 18.2.1	Sqm	207.00
18.3	Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen and the like consisting of :	Sqm	373.00
18.3.1	Labour rate for Item No. 18.3	Sqm	99.00
18.4	Providing and Placing in position suitable PVC water stops conforming to IS:12200 for construction/ expansion joints between two RCC members and fixed to the reinforcement with binding wire before pouring concrete etc. complete :		
18.4.1	Serrated with central bulb (225mm wide, 8-11mm thick).	meter	426.00
18.4.2	Dumb bell with central bulb (180mm wide, 8mm thick).	meter	439.00
18.4.3	Kickers (320mm wide, 5mm thick).	meter	452.00

S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
18.5	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying : (a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. This layer will be allowed to air cure for 4 hours. (b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	Sqm	193.00
18.5.1	Labour rate for Item No. 18.5	Sqm	89.00
18.6	Providing and laying water proofing treatment on roofs of slabs by applying cement slurry mixed with water proofing cement compound consisting of applying: (a) after surface preparation, first layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. (b) laying second layer of Fibre glass cloth when the first layer is still green. Overlaps of joints of fibre cloth should not be less than 10 cm. (c) third layer of 1.5 mm thickness consisting of slurry of cement @ 1.289 kg/sqm mixed with water proofing cement compound @ 0.670 kg/sqm and coarse sand @1.289 kg/sqm. This will be allowed to air cure for 4 hours followed by water curing for 48 hours. The entire treatment will be taken upto 30cm on parapet wall and tucked into groove in parapet all around. (d) fourth and final layer of brick tiling with cement mortar (which will be paid for separately For the purpose of measurement the entire treated surface will be measured.	Sqm	315.00
18.6.1	Labour rate for Item No. 18.6	Sqm	70.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
18.7	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations: (a) Applying a slurry coat of neat cement using 2.75 kg/sqm. of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300mm height including cleaning the surface before treatment. (b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs		
	(c) After two days of proper curing applying a second coat of cement slurry using 2.75kg/sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge. (d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3mm deep. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge :		
18.7.1	With average thickness of 120mm and minimum thickness at khurra as 65 mm.	Sqm	760.00
18.7.2	Labour rate for Item No. 18.7.1	Sqm	156.00
18.8	Providing and laying four courses water proofing treatment with bitumen felt over roofs consisting of first and third courses of blown bitumen 85/25 or 90/15 conforming to IS : 702 applied hot @ 1.45 Kg per square meter of area for each course, second course of roofing felt type 3 grade-I (hessian based self finished bitumen felt) and fourth and final course of stone grit 6mm and down size or pea-sized gravel spread at 6 cubic diameter per square meter including preparation of surface but excluding grading complete with :		
18.8.1	Bitumen felt (hessian base) type 3 grade I conforming to IS : 1322.	Sqm	243.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
18.8.2	Labour rate for Item No. 18.8.1	Sqm	39.00
18.9	Providing and laying six courses water proofing treatment with bitumen felt over roofs consisting of first, third and fifth course of blown bitumen 85/25 or 90/15 conforming to IS : 702 applied hot @ 1.45, 1.20 and 1.45 Kg per square meter of area respectively, second and fourth courses of roofing felt type 3 grade I conforming to IS : 1322 (Hessian based self finished bitumen felt) conforming to IS : 1322 and sixth and final course of stone grit 6 mm and down size or pea sized gravel spread at 6 cubic dm per sqm including preparation of surface but excluding grading, complete.	Sqm	377.00
18.9.1	Labour rate for Item No. 18.9	Sqm	58.00
18.10	Providing and laying six courses water proofing treatment with bitumen felt over roofs consisting of first, third and fifth courses of blown or / and residual bitumen applied hot at 1.45, 1.20 and 1.70 kg per square meter of area respectively, second and fourth courses of roofing felt type 2 grade I (fibre base self finished bitumen felt) six and final courses of stone grit 6mm and down size or pea sized gravel spread at 6cu.dm per sqm including preparation of surface, excluding grading, compete.	Sqm	409.00
18.10.1	Labour rate for Item No. 18.10	Sqm	78.00
18.11	Providing and laying six courses water proofing treatment with bitumen felt over roofs consisting of first, third and fifth courses of blow or/ and residual bitumen applied hot at 1.45, 1.20 and 1.70 kg per square meter of area respectively, second and fourth courses of roofing felt type 2 grade II (glass fibre base self finished bitumen felt) and sixth and final course of stone grit 6mm and down size or pea sized gravel spread at 6 cubic dm per sqm including preparation of surface but excluding grading, complete.	Sqm	408.00
18.12	Supplying and applying bituminous solution primer on roof and or wall surface at 0.24 litre per sqm.	Sqm	20.00
18.13	Deduct for omitting in water proofing treatment final course of spreading stone grit 6mm down size or pea sized gravel :		
18.13.1	At 6 cudm per sqm.	Sqm	10.00
18.13.2	at 8 cudm per sqm.	Sqm	13.00
18.14	Grading roof for water proofing treatment with: (upto two floor level)		
18.14.1	Cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate)	Cum	4154.00
18.14.2	Cement mortar 1:3 (1 cement : 3 coarse sand)	Cum	6535.00
18.14.3	Cement mortar 1:4 (1cement : 4 coarse sand)	Cum	5709.00
18.14.4	Labour rate for Item No. 18.14.1 to 18.14.3	Cum	1900.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
18.15	Providing and laying in situ seven course water proofing treatment with APP (Atactic poly-propylene) modified Polymeric memberane over roof consisting of first coat of bitumen primer @ 0.40Kg per sqm, 2nd, 4th & 6th courses of bonding material @ 1.20 Kg/sqm, which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, 3rd and 5th layers of roofing membrane APP modified Polymeric membrane 1.5mm thick of 2.25 Kg/sqm weight consisting of five layers prefabricated with centre core as 20micron HMHDPE film sandwiched on both sides with polymeric mix and the polymeric mix is protected on both side with 20micron HMHDPE film. 7th, the top most layer shall be finished with brick tiles of class designation 100 grouted with cement mortar 1:3 (1cement:3 fine sand) mixed with 2% integral water proofing compound by weight of cement over a 12mm layer of cement mortar 1:3 (1 cement : 3 fine sand) and finished neat which shall be paid for separately.	Sqm	362.00
18.15.1	Labour rate for Item No. 18.15	Sqm	39.00
18.16	Providing and laying in situ five course water proofing treatment with APP (Atactic Polypropylene) modified Polymeric memberane over roof consisting of first coat of bitumen primer @ 0.40Kg per sqm, 2nd & 4th courses of bonding material @ 1.20 Kg/sqm, which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, 3rd layer of roofing membrane APP modified Polymeric membrane 2.0mm thick of 3.00 Kg/sqm weight consisting of five layers prefabricated with centre core as 100micron HMHDPE film sandwiched on both sides with polymeric mix and the polymeric mix is protected on both side with 20micron HMHDPE film. 5th, the top most layer shall be finished with brick tiles of class designation 100 grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% integral water proofing compound by weight of cement over a 12mm layer of cement mortar 1:3 (1 cement : 3 fine sand) and finished neat which shall be paid for separately.	Sqm	279.00
18.16.1	Labour rate for Item No. 18.16	Sqm	28.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
18.17	Providing and laying in situ seven course water proofing treatment with APP (Atactic Polypropylene) modified Polymeric memberane over roof consisting of first coat of bitumen primer @ 0.40Kg per sqm, 2nd, 4th & 6th courses of bonding material @ 1.20 Kg/sqm, which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, 3rd and 5th layers of roofing membrane APP modified Polymeric membrane 2.0mm thick of 3.00 Kg/sqm weight consisting of five layers prefabricated with centre core as 100micron HMHDPE film sandwiched on both sides with polymeric mix and the polymeric mix is protected on both side with 20micron HMHDPE film. 7th, the top most layer shall be finished with brick tiles of class designation 100 grouted with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% integral water proofing compound by weight of cement over a 12 mm layer of cement mortar 1:3 (1 cement : 3 fine sand) and finished neat which shall be paid for separately.	Sqm	460.00
18.17.1	Labour rate for Item No. 18.17	Sqm	39.00
18.18	Providing and fixing APP (Atactic Polypropylene Polymer) modified prefabricated five layer 2mm thick water proofing membrance, black finished reinforced with glass fibre matt consisting of a coat of bitumen primer for bitumen membrane @ 0.40 ltr/sq. mtr. by the same membrance manufacture of density at 25°C, 0.87 - 0.89 kg/ ltr and viscocity 70 - 160 cps. Over the primer coat the layer of membrane shall be laid using Butane torch and sealing all joints etc., and preparing the surface complete. The vital physical and chemical parameters of the membrane shall be as under : Joint strength in longitudinal and transverse direction at 23°C as 350/300 N/ 5cm. Tear strength in longitudinal and transverse direction as 60/80N. Softening point of membrane not less than 150°C. Cold flexibility shall be upto -2°C when tested in accordance with ASTM, D - 5147. The laying of membrane shall be got done through the authorised applicator of the manufacture of membrane.		
18.18.1	2mm (for corrugated roof sheets)	Sqm	287.00
18.18.2	Labour rate for Item No. 18.18.1	Sqm	39.00

S.No.	Particulars of Items	Unit	Rate (in Rs)
18.19	Providing and laying APP (Atactic Polypropylene Polymer) modified prefabricated five layer, 3mm thick water proofing membrane, black finished reinforced with glass fibre matt consisting of a coat of bitumen primer for bitumen membrane @ 0.40 ltr/sqm. by the same membrane manufactured of density at 25°C, 0.87 - 0.89 kg/ltr and viscocity 70 - 160 cps. Over the primer coat the layer of membrane shall be laid using butane torch and sealing all joints etc., and preparing the surface complete. The vital physical and chemical parameters of the membrane shall be as under : Joint strength in longitudinal and transverse direction at 23°C as 350/300 N/5cm. Tear strength in longitudinal and transverse direction as 60/80N. Softening point of membrane not less than 150°C. Cold flexibility shall be upto -2°C when tested in accordance with ASTM, D - 5147. The laying of membrane shall be got done through the authorised applicator of the manufacturer of membrane :		
18.19.1	3 mm thick	Sqm	340.00
18.19.2	Labour rate for Item No. 18.19.1	Sqm	39.00
18.20	Providing and laying APP (Atactic Polypropylene Polymer) modified prefabricated five layer 3mm thick water proofing membrane, black finished reinforced with non-woven polyester matt consisting of a coat of bitumen primer for bitumen membrane @ 0.40 ltr/sqm. by the same membrane manufacture of density at 25°C, 0.87-0.89 kg/ltr and viscocity 70-160 cps. Over the primer coat the layer of membrane shall be laid using Butane Torch and sealing all joints etc., and preparing the surface complete. The vital physical and chemical parameters of the membrane shall be as under : Joint strength in longitudinal and transverse direction at 23°C as 650/450N/5cm. Tear strength in longitudinal and transverse direction as 300/250N. Softening point of membrane not less than 150°C. Cold flexibility shall be upto -2°C when tested in accordance with ASTM, D - 5147. The laying of membrane shall be got done through the authorised applicator of the manufacturer of membrane :		
18.20.1	3 mm thick	Sqm	391.00
18.20.2	Labour rate for Item No. 18.20.1	Sqm	39.00
18.21	Extra for covering top of membrane with Geotextile, 120 gsm non woven, 100 % polyester of thickness 1 to 1.25 mm bonded to the membrane with intermittent touch by heating the membrane by Butane Torch as per manufactures recommendation [for Item No. 18.19 to 18.20].	Sqm	44.00
18.22	Providing and laying second quality white ceramic tiles 300 x 300mm (9 to 10 mm thick) on roof jointed with white cement mortar 1:4 mixed with 2 percent integral water proofing compound laid over 20mm thick cement mortar 1:4.	Sqm	926.00

19.0 HORTICULTURE & LANDSCAPING

Notes for Specifications :-

1 In case where unsuitable soil is met with, it shall be either removed or replaced with good earth.

2 Generally the depth of trenching is 30cm for grassing & 60cm for regrassing in good soil.

3 The trenched ground shall, after rough dress, be flooded with water by making small kiaries to enable the soil to settle down.

4 Weeds or other vegetation which appear on the ground are than uprooted and removed and disposed off and paid.

5 Trenching shall consist of the following operations

(i) The whole plot shall be divided into narrow rectangular strips of about 1.5 m width.

(ii) These strips shall be sub-divided lengthwise into about 1m long sections.

(iii) Such sections shall be excavated serially and excavated soil deposited in the adjacent section preceding it.

(iv) In excavating and depositing care shall be taken that the top soil with all previous plant growth including roots, get buried in the bottom layer of trenched area, the dead plants so buried incidentally being formed into humus.

(v) The excavated soil shall be straight away dumped into the adjoining sections so that double handling otherwise involved in dumping the excvated stuff outside and in back filling in the trenches with leads is practically eliminated.

6 **MEASUREMENT OF TRENCHING**

Length and breadth of the plot shall be taken correct to 0.1 m and depths correct to cm. Cubical contents shall be calculated in cubic meters, correct to two places of decimal. No deduction shall be made nor extra paid for removing stones, brick bats and other foreign matter met with during excavation upto initial lead of 50m and stacking the same.

7 **GRASSING**

(i) The area from where the grass roots are to be obtained. The soil shall be suitably moistened and then the operation of planting grass shall be commenced. The grass shall be dinbbled at 10 cm, 7.5 cm and 5 cm apart in any direction or other spacing as described in the item.

(ii) Dead grass and weeded shall not be planted.

(iii) Watering of the lawn shall be done 30days planting shall be done in other direction at 15cm, 10cm spacing is done in the case of large open spaces, at 7.5cm spacing in residential lawn and at 5cm spacing for Tennis Court and sports ground lawn.

8 **MEASUREMENT OF LAWN**

Length, breadth of the lawn grassed shall be measured correct to 0.1 meter and the area shall be calculated in sqm. Correct to two places of decimal.

9 **RENOVATION OF LAWNS**

The area shall be first weeded out of all undersirable growth. The entire grass shall be scrapped (cheeled) without damaging roots and level of the grounds. Slight irregularities in surface shall be levelled off and the area shall then be forked so as to aerate the roots of the grass without, however up-rooting them.

10 DIGGING HOLES FOR PLANTING TREES

In ordinary soil, including refilling earth after mixing with oil cake, manure and watering.

Holes of circular shape in ordinary soil shall be excavated to the dimensions described in the items and excavate soil broken to clods of size not exceeding 75mm in any direction, shall be stacked outside the hole, stones, brick bats, unsuitable earth and other rubbish, all roots and other undesirable growth met with during excavation shall be separated out and unserviceable material removed from the size as directed. Useful material, if any, shall be stacked properly and separately. Good earth in quantities as required to replace such discarded stuff shall be brought and stacked at site by the contractor which shall be paid for separately.

The tree holes shall be manured with powdered Neam/castor oil cake at the specified rate along with farm yard manure over sludge shall be uniformly mixed with the excavated soil after the manure has been broken down to powder, (size of particle not be exceeded 6 mm in any direction) in the specified proportion, the mixture shall be filled in to the hole up to the level of adjoining ground and then profusely watered and enable the soil to subside the refilled soil shall then be dressed evenly with its surface about 50 to 75 mm below the adjoining ground level.

Where holes are dug in (a) Hard soil (b) Ordinary rock or (c) Hard rock, the above soils occuring independently over in conjunction with each other and /or ordinary soil in any hole, the different excavated soil shall be stacked separately. Excavation in hard rock shall be carried out by chiseling only.

Sufficient quantity of good soil to replace the solid volume of stones, brick bats, unsuitable earth and other rubbish, all roots and other undesirable growth, ordinary and hard stacks shall be brought and stacked at site but the supply and stacking of such shall be paid for separately.

The ordinary soil excavated from the hole and the earth brought from outside shall then be mixed with manure screened through sieve of IS designation 16 mm in the proportion specified in the description of the item and filled with the pit and the same watered and finally dressed.

The stack measurement of ordinary rock and hard rock shall be reduced by 50% and of soil by 20% to arrive at the excavated volume. This excavation shall be paid for as extra over the rate for holes dug in ordinary soil above, at rate appropriate to particular soil concerned.

11 TREE GUARD

The tree guard shall be 600 mm in diameter and 2 meter high above ground level and 25 cm in below ground level.

The tree guard shall be framed of 4 nos. 25 x 6 m M.S. flate 2 meter long excluding displayed outward at lower and upto an extent 10 cm and 8 nos. 25 x 3 mm vertical M.S. Flat Rivetted to 3 Nos. 25 x 6 mm Flat iron rings in two halves, bolted together 8 mm dia and 30 mm long M.S. bolts and nuts. The entire tree guard shall be given two coats of synthetic enamel paint of approved brand and manufacturer of required shall over a priming coat of ready mixed steel primer.

12 Rates

The rate include the cost of all the labour and material required for the completion of items.

(For Detail Refer Chapter of Water Proofing Treatment specification)

19.0 HORTICULTURE & LANDSCAPING			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
19.1	Trenching in ordinary soil up to 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	129.00
19.2	Supplying and stacking of good earth at site including royalty and carriage up to 1 km (earth measured in stacks will be reduced by 20% for payment).	Cum	184.00
19.3	Supplying and stacking sludge at site including royalty and carriage up to 1 km (sludge measured in stacks will be reduced by 8% for payment).	Cum	162.00
19.4	Supplying and stacking at site dump manure from approved source, including carriage up to 1 km (manure measured in stacks will be reduced by 8% for payment)		
19.4.1	Screened through sieve of I.S. designation 20mm	Cum	105.00
19.4.2	Screened through sieve of I.S. designation 16mm	Cum	115.00
19.4.3	Screened through sieve of I.S. designation 4.75mm	Cum	123.00
19.5	Rough dressing the trenched ground including breaking clods.	100sqm	42.00
19.6	Uprooting weeds from the trenched area after 10 to 15 days of its flooding with water including disposal of uprooted vegetation.	100sqm	137.50
19.7	Fine dressing the ground	100sqm	103.00
19.8	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	15.00
19.9	Mixing earth and sludge or manure in proportion specified or directed.	Cum	102.00
19.10	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).		
19.10.1	In rows 15 cm apart in either direction.	100sqm	156.00
19.10.2	In rows 7.5 cm apart in either direction.	100sqm	324.00
19.10.3	In rows 5 cm apart in either direction.	100sqm	496.00

S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
19.11	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).	100sqm	959.00
19.12	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.	100sqm	1702.00
19.13	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, leveling etc. including stacking and disposal of materials declared unserviceable and surplus earth by spreading and leveling as directed, within a lead of 50m lift up to 1.5 m complete (cost of sludge, manure or extra earth to be paid for separately).	Cum	62.00
19.14	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, sludge or extra good earth if needed to be paid for separately) :		
19.14.1	Holes 1.2 m dia and 1.2 m deep.	Each	182.00
19.14.2	Holes 60 cm dia, and 60 cm deep.	Each	24.00
19.15	Half brick circular tree guard in 50 class designation bricks, internal diameter 1.25 meter and height 1.2 meter 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:		
19.15.1	With Chimney Bricks	Each	1511.00
19.15.2	Labour rate for Item No. 19.15.1	Each	103.00

S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
19.16	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	2037.00
19.16.1	Labour rate for Item No. 19.16	Each	671.00
19.17	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 :		
19.17.1	A coat of coal tar.	Each	137.00
19.17.2	Two or more coats of synthetic enamel paint of approved quality shade over a priming coat.	Each	226.00
19.17.3	Labour rate for Item No.- 19.17.1	Each	41.00
19.18	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 :		
19.18.1	A coat of coal tar.	Each	284.00
19.18.2	Two or more coats of synthetic enamel paint of approved quality and shade over a priming coat.	Each	422.00
19.18.3	Labour rate for Item No.- 19.18.1	Each	60.00
19.19	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 :		
19.19.1	40 class designation.		
19.19.1.1	chimney. Bricks	Meter	34.00
19.19.2	50 class designation.		
19.19.2.1	chimney. Bricks	Meter	34.00
19.19.3	Labour rate for Item No.- 19.19.1 to 19.19.2	Meter	4.00
19.20	Filling mixture of earth and sludge or manure in the desired proportion in trenches, flooding with water and leveling (cost of supplying earth and sludge or manure and mixing excluded).	Cum	5.00

S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
19.21	Excavation in dumped stones or malba including stacking of serviceable and unserviceable material separately and disposal of unserviceable material lead up to 50m and lift up to 1.5m disposed material to be neatly dressed.	Cum	142.00
19.22	Excavation in bajri path including stacking of serviceable and unserviceable material lead up to 50 m and lift up to 1.5 m disposed material to be neatly dressed.	Cum	159.00
19.23	Excavation in water bound macadam road including stacking the serviceable and unserviceable material separately and disposal of unserviceable material lead up to 50 m and lift up to 1.5 m disposed material to be neatly dressed.	Cum	195.00
19.24	Flooding the ground with water including making kiaries and dismantling the same.	100sqm	78.00

20.00 FORM WORK

Notes for Specifications

1 Form Work shall include all temporary or permanent forms or moulds required for forming the concrete which is cast-in-situ, together with all temporary construction required for their support.

2 It shall be strong enough to withstand the dead and live loads and forces caused by ramming and vibrations of concrete and other incidental loads, imposed upon it during and after casting of concrete.

3 It shall be made sufficiently rigid by using adequate number of ties and braces, screw jactks or hard board wedges where required shall be provided to make up any settlement in the form work either before or during the placing of concrete.

4 Form shall be so constructed as to be removable in sections in the desired sequence.

5 The staging to be either of Tubular steel structure with adequate bracings as approved or made of built up structural sections made form rolled structural steel sections.

6 Shuttering used shall be of sufficient stiffness to avoid excessive deflection and joints shall be tightly butted to avoid leakage of slurry.

7 The completed form work shall be inspected and approved by the Engineer-in-Charge before the reinforcement bars are placed in position.

8 Measurement

Measurement shall be taken of the area of shuttering in contact with the concrete surfaces. Dimensions of the form work shall be measured correct to a cm. measurement shall be taken separately for each part of the construction.

9 Centering and shuttering where exceeding 3.5 meter height in one floor shall be measured and paid for separately.

10 Rates

Rates in this chapter are for the finished work including the cost of all materials labour, tools and plant required for design, construction and removal of formwork including properly supporting the members until the concrete is cured, set and hardened as required and also inclusive of lining with material approved by the Engineer-in-Charge so as to provide a smooth finish of uniform texture, apperance and to produce a finished concrete true to shape line, levels and dimension shown on the drawings.

(For Detail Refer Chapter of Form Work specification)

20.00 FORM WORK			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
20.1	Centering and shuttering including strutting, propping etc.and removal of form for :		
20.1.1	Foundations, footings, bases of columns, etc. For mass concrete.	Sqm	138.00
20.1.2	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc	Sqm	216.00
20.1.3	Suspended floors, roofs, landings, balconies and access platform.	Sqm	227.00
20.1.4	Shelves (Cast in situ)	Sqm	227.00
20.1.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	Sqm	203.00
20.1.6	Columns, Pillars, Piers, Abutments, Posts and Struts.	Sqm	282.00
20.1.7	Stairs, (excluding landings) except spiral-staircases.	Sqm	278.00
20.1.8	Spiral staircases (including landing).	Sqm	229.00
20.1.9	Arches, domes, vaults up to 6 m span	Sqm	728.00
20.1.10	Extra for arches, domes, vaults exceeding 6 m span	Sqm	402.00
20.1.11	Chimneys and shafts	Sqm	220.00
20.1.12	Well steining	Sqm	461.00
20.1.13	Vertical and horizontal fins individually or forming box	Sqm	384.00
20.1.14	Extra for shuttering in circular work 20% of respective		
20.1.15	Small lintels not exceeding 1.5m clear span, moulding as in cornices, window sills, string courses, bands, copings, bed plates, anchor blocks and the like.	Sqm	138.00
20.1.16	Edges of slabs and breaks in floors and walls.		
20.1.17	Under 20 cm wide	Meter	88.00
20.1.18	Above 20 cm wide	Meter	397.00
20.1.19	Cornices and mouldings	Sqm	464.00
20.1.20	Small surfaces such as cantilever ends, brackets and ends of steps, caps and bases to pilasters and columns and the like.	Sqm	336.00
20.1.21	Weather shade, Chajjas, corbels etc., including edges	Sqm	352.00
20.1.22	Suspended floors, roofs, landings, balconies and access platform. with water proof ply 12mm thick	Sqm	302.00
20.1.23	Lintels, beams, plinth beams, girders, bressumers and cantilevers. with water proof ply 12mm thick	Sqm	397.00
20.2	Providing and fixing tie bolt, spring coil and plastic cone in wall shuttering complete as per the direction of Engineer-in-charge		
20.2.1	12 mm dia. & 100 mm length.	Each	125.00
20.2.2	12 mm dia. & 150 mm length.	Each	139.00
20.2.3	20 mm dia. & 150 mm length.	Each	159.00
20.2.4	20 mm dia.& 225 mm length.	Each	177.00

20.3	Extra for additional height in centering, shuttering where ever required with adequate bracing, propping etc. including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 meter or part thereof. (Plan area to be measured)		
20.3.1	Suspended floors, roofs, landing, beams and balconies (Plan area to be measured)	Sqm	128.00
20.4	Providing and fixing double scaffolding system (cup lock type) on the exterior side, up to seven story height made with 40mm dia. M.S. tube 1.5m centre to centre horizontal & vertical tubes joining with cup & lock system with M.S. tubes, M.S. tube challies, M.S. clamps and M.S. staircase system in the scaffolding for working platform etc.and maintaining it in a serviceable condition for the required duration as approved and removing it there after. The scaffolding system shall be stiffened with bracings, runners, connection with the building etc wherever required for inspection of work at required locations with essential safety features for the workmen etc. complete as per directions and approval of Engineer-in-charge. The lavational area of the scaffolding shall be measured for payment purpose. The payment will be made once irrespective of duration of scaffolding.	Kg	107.00

21.00 HIRE RATE FOR PLANTS			
NOTE:-			
1	Rate includes chages for driver and helper.		
2	Rate doesn't include the cost of diesel oil required for running.		
3	Rate include the repair cost of machine except repair of puncher or similer minor repair.		
S.No.	**Particulars of Items**	**Unit**	**Rate(in Rs)**
21.1	Hire charges of Diesel Truck - 9 tonne	Day	1150.00
21.2	Water tanker.	Day	1275.00
21.3	Hire and running charges of tipper	Day	1300.00
21.4	Tractor with trolley.	Day	800.00
21.5	Hire charges of Diesel Road Roller - 8 to 10 tonne	Day	1200.00
21.6	Hire charges of Concrete Mixer 0.14 cubic meter	Day	700.00

22.00 WATER HARVESTING, RECYCLE AND REUSE WASTEWATER

Notes for Specifications

1 There are two board approaches to harvesting water:-

(a) Storing rainwater for direct use

(b) Recharging groundwater aquifers

In Madhya Pradesh the total annual rainfall occurs only during 3 or 4 months of mansoon. The water collected during the mansoon has to be stored throughout the year; which means that huge volumes of storage containers would have to be provided. Hence it is more feasible in urban area to use rainwater for recharging groundwater aquifers rather then for storage.

1.2 **Rainwater harvesting method for urban areas:-**

(a) Recharge pit

(b) Recharge Trench

(c) Tube well

(d) Recharge Well

In urban areas, rain water available from roof tops of buildings, paved and unpaved areas goes waste. This water can be recharged to aquifer and can be utilized gainfully at the time of need. The rain water harvesting system needs to be designed in a way that it does not occupy large space for collection and recharge system. A few techniques of roof top rain water harvesting in urban areas are described below:-

1.3 **Roof top rain water Harvesting Through Re-charge pit**

(a) In alluvial areas where permeable rocks are exposed on the land surface or at very shallow depth, rooftop rain water harvesting can be done through recharge pit

(b) The technique is suitable for building having a roof area of 100 sq.m. and are constructed for recharging the shallow aquifers.

(c) Recharge pit may be of any shape and size and are generally constructed 1 to 2 m. wide and 2 and 3m. Deep which are back filling with boulders (5-20 cm), gravels (5-10 mm) and coarse sand (1.5-2mm) in graded from - Boulders at bottom, gravels in between and coarse sand at the top so that the silt content that will come with runoff will be deposited on the top of coarse sand layer and can easily be removed. For smaller roof area, pit may be filled with broken bricks/cobbles.

(d) A mesh should be provided at the roof so that leaves or any other solid waste/debris is prevented from entering the pit and a desilting/collection chamber may also be provided at the ground to arrest the flow of finer particles to the recharge pit

(e) The top layer of sand should be cleaned periodically to maintain the recharge rate.

(f) By-Pass arrangement be provided before the collection chamber to reject the first showers.

1.4 **Roof top rain water Harvesting Through Recharge Trench**

(a) Recharge trenches are suitable for buildings having roof area of 200-300 sq.m. and where permeable strata is available at shallow depths.

(b) Trench may be 0.5 to 1 m.wide, 1 to 1.5m. Deep and 10 to 20m. Long depending upon availability of water to be recharged.

(c) These are back filling with boulders (5-20 cm), gravels (5-10 mm) and coarse sand (1.5-2mm) in graded from - Boulders at bottom, gravels in between and coarse sand at the top so that the silt content that will come with runoff will be deposited on the top of coarse sand layer and can easily be removed.

(d) A mesh should be provided at the roof so that leaves or any other solid waste/debris is prevented from entering the pit and a desilting/collection chamber may also be provided at the ground to arrest the flow of finer particles to the recharge pit

(e) By-Pass arrangement be provided before the collection chamber to reject the first showers.

(f) The top layer of sand should be cleaned periodically to maintain the recharge rate.

1.5 **Roof top Rain Water Harvesting through Existing Tube well.**

(a) In area where the shallow aquifers have dried up and existing tube wells are tapping deeper aquifers, roof top rain water harvesting through existing tube well can be adopted to recharge the deeper aquifers.

(b) PVC pipes of 10cm dia are connected to roof drains to collect rain water. The first roof runoff is let off through the bottom of drain pipe. After closing the bottom pipe, the rain water of subsequent rain showers is taken through a T to an online PVC filter. The filter may be provided before water enters the tube well. The filter is 1-1.2m. in length and is made up of PVC pipe. It's diameter should very depending on the area of roof, 15cm if roof area is less then 150sq.m. and 20cm if the roof area is more. The filter is provided with a reducer of 6.25cm on both the sides. Filter is divided into three chambers by PVC screens so that filter material is not mixed up. The first chamber is filled up with gravel (6-10mm),middle chamber with pebbles(12-20mm) and last chamber with bigger pebbles (20-40mm).

(c) If the roof area is more, a filter pit may be provided. Rain water form roof is taken to collection/desilting chambers located on ground. These collection chamber are interconnected as well as connected to the filter pit through pipes having a slope of 1:15. The filter pit may very in shape and size depending upon available run off are back-filling with graded material, boulder at the bottom, gravel in the middle and sand at the top with varying thickness (0.30-0.50m.)and may be separated by screen. The pit is divided into two chambers, filter material in one chamber and other chamber is kept empty to accommodate excess filtered water and to monitor the quality of filtered water. A connecting pipe with recharge well is provided at the pit for recharging of filtered water through well.

1.6 **Roof top Rain Water Harvesting through Trench with Recharge Well**

(a) In area where the surface soil is impervious and large quantities of roof water or surface runoff is available within a very short period of heavy rainfall, the use of trench/pit is made to store the water in a filter media and subsequently recharge to groundwater through specially constructed recharge wells.

(b) The technique is ideally suited for area where permeable horizon is within 3m below ground level.

(c) Recharge well of 100-300 diameter is constructed to a depth of at least 3 to 5 m below the water level. Based on the litho logy of the area well assembly is designed with slotted pipe against the shallow and deeper aquifer.

(d) A lateral trench of 1.5 to 3m width and 10 to 30m length , depending upon the availability of water is constructed with the recharge well in the centre.

(e) The number of recharge wells in the trench can be decided on the basis of water availability and local vertical permeability of the rocks

(f) The Trench is backfilled with boulders, gravels and coarse sand to act as a filter media for the recharge wells

(g) If the aquifer is available at greater depth say more then 20m, a shallow shaft of 2 to 5 m diameter and 3 to 5 meters deep may be constructed depending upon availability of runoff. Inside the shaft a recharge well of 100-300mm dia is constructed of recharging the available water to the deeper aquifers. At the bottom of the shaft media is provided to avoid choking of recharge well.

1.7 PVC Pipe shall be as per IS 4985

1.8 **Gravel** : It shall consist of naturally occurring (uncrushed, crushed or broken) river bed shingle or pit gravel. It shall be sound, hard and clean. It shall be free from flat particles of shale or similar laminated material, powdered clay, silt, loam, adherent coating, alkali, vegetable matter and other deleterious substances.

1.9 **Brick bats**: Brick bats shall be obtained by breaking well burnt or over burnt dense brick/brick bats. They shall be homogeneous in texture, roughly cubical in shape and clean.

2 Domestic Waste Water

Types of waste water are given below:

1	Black Water	Water from flush toilets(faeces and urine with flush water)
2	Grey Water	Water from the kitchen, bathroom, washing machine (dose not contain faeces and urine)
3	Yellow Water	Urine from urinals (with or without water for flushing)
4	Brown Water	Black water without urine or yellow water

2.1 Black Water

Black Water is water from toilets with flush water, faeces (brown water) and urine (yellow Water). It consist a high concentration of organic carbon and concentration of nitrogen, phosphorus and pathogens.

2.2 Grey water

Grey water comes from activities like washing of clouths, bathing and cooking and contains synthetic detergents. Kitchen waste consist of food residues as well as type of grease (fat).

2.3 System of Treatment of waste water

Type of treatment

(i) DEWATS

(ii) Reed bed system

(iii) Septic tank with soak pit or

(iv) Soil biotechnology

(v) Improved septic tank

2.4 **DEWATS Component of system**

DEWATS applications are based on four basic treatment modules, which are combined according to specific requirements. These include two post- treatment methods in the reed bed system and in ponds.

(i) Primary treatment, which includes pre-treatment and sedimentation in settlement tank or septic tank.

(ii) Secondary anaerobic treatment in baffled reactors.

(iii) Tertiary aerobic/anaerobic treatment in reed bed system.

(iv) Aerobic treatment in ponds.

2.5 **Grey water recycling**

Treating household grey water

At the household level, grey water is treated by constructing plated filler. The amount of grey water output is estimated at 180 liter per day. A reed bed of 1 m width, 2 m length and 0.6 m depth (1 per cent slope at the bottom) provides retention for a volume of 1.2 cu m of wastewater. When filled with gravel with about 30 per cent pore space, the free volume available was 0.36 cu m or 360 liter. This is sufficient to provide a retention time of up to two days for the wastewater. However, actual retention time will depend on the frequency and the number of users.

The pit is lined with polythene and a brick wall is built around it to prevent the inflow of surface run-off into the unit. At the inlet, a plastic tub is placed to serve as the inlet chamber. Bath water is filled into this tub. The suspended particles become sediment and wastewater overflows from this tub to the inlet of the remediation chamber, where coarse gravel (3 cm) has been filled. The rest of the unit is filled with small gravel (1 cm) up to the outlet end of the bed. At the bottom, a perforated pipe is laid, to collect the treated water. At the outlet, the water is led into a small tank and stored for irrigation.

2.6 **Improved septic tank: -**

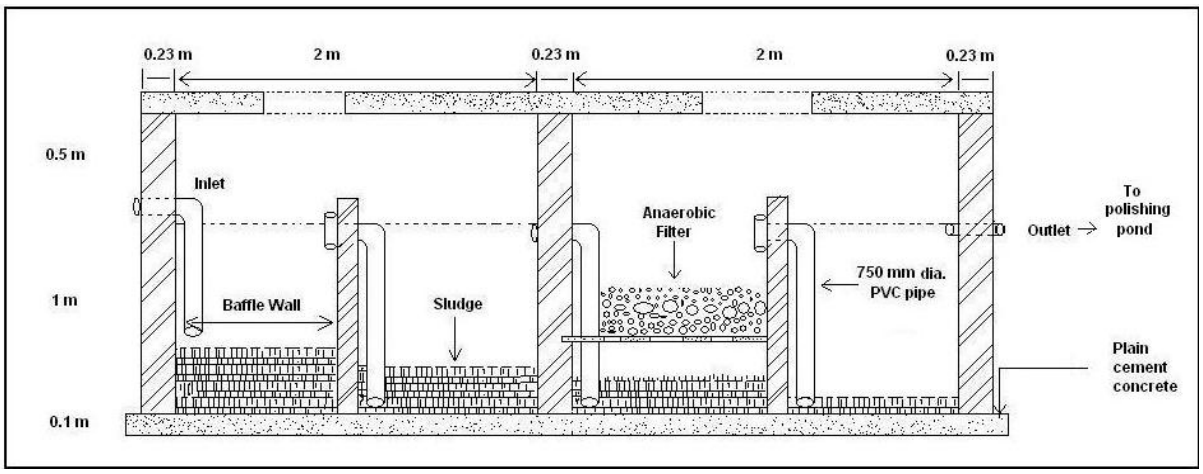
Screened (through a screen with bars 25-50 mm apart) wastewater is diverted to be septic tank which is collected in a serial of connection chamber is divert to the improved septic tank, which is provided with four chambers, each 1m in length and 1.5 m in depth.

The incoming raw sewage settles in the first chamber and the overflow moves to the next chambers through the 75 mm pvc pipe provide at the top of each chamber. The pipe helps to mix the raw sewage with already existing activated sludge, which is enriched in microorganisms for digesting it. In order to enhance the function of the microorganisms, a biocatalyst is added to the septic tank. The biocatalyst, which are in crystal from, speed up the reaction but are not affected themselves Apart from biocatalyst – in order to improved the treatment process – an anaerobic up flow filter is also installed.

Anaerobic filter are provided in the third chamber of the septic tank. The filter act as an ideal breeding ground for the microbes and result in effective treatment of incoming wastewater. Most of the treatment in the septic tank takes place under anaerobic condition .Hence by adding a polishing pond to the system, aerobic reaction is also incorporated. In the polishing pond the treated water is exposed to sunlight, which helps in reducing the pathogen count. Finally , this treated water is used for irrigation.

Above plant is sufficient for treatment of wastewater 600 liter per day

Improved Septic tank



3 Measurements :

The Gravel shall be measured in stacks and paid for after making a deduction of 7.5% of the gross measurements of stacks.

4 Rates

Rates include cost of material & labour.

(For Detail Refer Chapter of Water Harvesting, Recycle and Reuse Wastewater specification)

22.00 RAINWATER HARVESTING, RECYCLE AND REUSE WASTEWATER			
S.No.	**Particulars of Items**	**Unit**	**Rate (in Rs)**
	ROOF TOP RAIN WATER HARVESTING		
22.1	Providing & laying of P.V.C. pipe for roof top harvesting from roof slab to Ground floor including all fittings, jointing material with bypass arrangement with suitable valves.		
22.1.1	P.V.C. pipe 6kg/sqm (90 mm)	Sqm	1282.00
22.1.2	P.V.C. pipe 6kg/sqm (110 mm)	Sqm	1696.00
22.2	Excavation of trench for laying of pipe for water harvesting at ground floor and refilling watering and ramming the average depth of trench is 0.65 meter.		
22.2.1	Excavation for 90mm	Meter	81.00
22.2.2	Excavation for 110mm	Meter	85.00
22.3	Construction of percolation chamber/pit including dismantling of floor area for contraction of pit, excavation in all type of soil/murrum, brick masonry with chimney brick TM-40 (with making outlet, inlet, outlet hole as per designe) in cement mortar 1:4, with 12 mm thick plaster in cement mortar 1:3.	cum	4812.00
22.4	Provided M-20 (with 20 mm nominal size) RCC cover 0.075m thick without frame for percolation pit including cost of steel.	Sqm	1001.00
22.5	Boring holes with Auger upto depth of 3.6 m for water harvesting system.		
22.5.1	150 mm dia	RM	102.00
22.5.2	200 mm dia	RM	145.00
22.5.3	Add for ever 50 cm depth where depth is more than 3.6 m	RM	62.00
22.6	Providing PVC pipe slotted as per direction Engineer-in-Charge and fixing in Rain water recharge pit/Percolation pit or Soakway with jute coir wrapping pipe.		
22.6.1	140 mm dia	RM	327.00
22.6.2	200 mm dia	RM	514.00
22.7	Providing and laying filter material as given below in recharge pit/ percolation pit or soak pit/ waste water treatment system.		
22.7.1	Sand (1.5 mm to 2.00 mm)	Cum	1365.00
22.7.2	Gravel/Pebbles (5 to 25 mm)	Cum	1138.00
22.8	Brick bats	Cum	955.00
22.9	Plantation of reed grass in waste water treatment system with material	Sqm	55.00

CHAPTER- 23
BUILDING WATER SUPPLY

1 **GENERAL**

(i) All pipe work shall be planned so that the piping is accessible for inspection, replacement and repair. To avoid its being unsightly, it is usually possible to arrange it in or adjacent to cupboards, recesses, etc. provided there is sufficient space to work on the piping with the usual tools. Piping shall not be buried in walls or solid floors. Where unavoidable, piping may be buried for short distances provided that adequate protection is given against damage and that no joints are buried. If piping is laid in ducts or chases, these shall be roomy enough to facilitate repairs and shall be so constructed as to prevent the entry of vermin. To facilitate removal of pipe casing, floor boards covering piping shall be fixed with screws or bolts.

(ii) When it is necessary for a pipe to pas through a wall or floor, a sleeve shall be fixed therein for insertion of the pipe and to allow freedom for expansion, contractor and other movement. Piping laid in wood floors shall, where possible, be parallel with the joists.

(iii) Where storage tanks are provided to meet overall requirements of water connection of service pipe with any distributing pipe shall not be permitted except on direct connection for culinary or drinking requirements.

(iv) No service pipe shall be connected to any water closet or urinal. All such supplies shall be from flushing cisterns which shall have supply from storage tank.

(v) No service or supply pipe shall be connected directly to any hot-water system or to any apparatus used for heating other than through a feed cistern thereof.

2 Galvanized mild steel tubes/pipes with threaded and screw ends, medium grade shall conform to I.S. 1239-2004 Part I, screwed both ends conforming to IS:544-1955, pipe threads shall be used. The G.I. filleting shall be conforming to IS 1239-2004 Part II.

2.1 Mass of medium class pipes

(a)

Nominal bore : in mm	Mass of Screwed & Socketed G.I. Pipes (in Kg per mtr.)
	Medium
6	0.407
8	0.645
10	0.845
15	1.22
20	1.57
25	2.43
32	3.13
40	3.6
50	5.1
65	6.54
80	8.53
100	12.5
125	16.4
150	19.5

(b) **Tolrance Mass :**

Single tube (medium and heavy series)	± 10 percent
For quantities per load of 10 tonnes, Min (medium and heavy series)	± 7.5 percent

(c) Tolrance Thickness :

Welded tubes	
Medium	+ not limited
	- 10 percent
Seamless tubes	+ not limited
	- 10 percent

3 **Laying Jointing of GI pipes: -**

The pipes shall be cleaned and cleared of all foreign matter before being laid. In jointing the pipes, the inside of the socket and the screwed end of the pipes shall be oiled and rubbed over. Teflon Tape should be used on threads instead of 'Dhaaga/Safeda'. The end shall then be screwed in the socket, Tee etc. with the pipe wrench.

For internal work the galvanized iron pipes and fittings shall run on the surface of the walls on ceiling (not in chase) unless otherwise specified. When it is found necessary to conceal the pipes, chasing may be adopted or pipes fixed in the ducts or recess etc. provided there in sufficient space to work on the pipes with the usual tools. The pipes shall not ordinarily be buried in walls or solid floors. Where unavoidable, pipes may be buried for short distances provided adequate protection is given against damage and where so required joints are not buried. Where directed by the Engineer-in-Charge, as M.S. tube sleeve shall be fixed at a place the pipe is passing through a wall or floor for reception of the pipe and to allow freedom for expansion and contraction and other movements. In case the pipe is embedded in walls or floors it should be painted with anticorrosive bitumastic paints of approved quality. Under the floors the pipes shall be laid in layer of sand filling as done under concrete floors.

For G.I. pipes 15 mm diameter, the holes in the walls and floors shall be made by drilling with chisel or jumper and not by dismantling the brick work or concrete. However, for bigger dimension pipes holes shall be carefully made of the smallest size as directed by the Engineer-in-Charge. After fixing the pipes the holes shall be made good with cement mortar 1:3 (1 cement: 3 coarse sand) and properly finished to match the adjacent surface.

3.A **Measurements**

The lengths shall be measured in running metre correct to a cm for the finished work. It shall include G.I. pipe and G.I. fittings such as bends, tees elbows etc, but exclude brass or gun metal taps (cocks), valves, unions, lead connection pipes and shower rose. All pipes and fittings shall be classified according to their diameters, method of jointing and fixing substance, quality and finish. In case of fittings of an equal bore the pipe shall be described as including all cuttings and waste. In case of fittings of unequal bore, the largest bore shall be measured. Pipes laid in trenches (or without supports) and pipes fixed to walls, ceilings, etc. with supports shall be measured separately.

4 The pipes and fittings after they are laid and jointed shall be tested to hydraulic pressure of 6 Kg/ sq. cm (60 meter). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw off taps and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped, the test pressure should be maintained without loss for at least half an hour. Pipes or fitting which are found leaking shall be replaced and joints found leaking shall be redone, without extra payment.

5 Non-Return valve (Gun Metal) shall conform IS 778.

6 Sluice valves (Gun Metal) shall conform IS 780.

7 All brass fittings including valves, stop cocks, ferrules, bib cocks shall conform to relevant I.S. specifications.

8 Ball valves shall comply the requirements of IS 1703.

9 HDPE water storage tanks should (conform IS : 1270) be of approved make as approved by the Engineer-in-Charge.

10 All socket and spigot spun Iron pipes shall conform to I.S. 1534-1947.

11 Water supply lines shall be avoided at the openings and they shall also not run with the lines carrying waste materials. Water supply line shall also not cross each other as far as possible.

12 The rates include cost of all materials, labour, T & P, hire & running charges of machineries etc. complete with all leads & lifts for all materials required for the work.

13 **POLYPROPYLENE RANDOM CO-POLYMER(PP-R) PIPES: -**

(i) The pipe shall be conforming to the requirement to IS 15801.
(ii) The pipe should have smooth inner surface with non-contracting diameter.
(iii) The pipe shall be cleanly finished, free from crack and other defects.

13.A **Jointing Procedure: -**

The jointing of PP-R pipes and fitting are done by fusion welding by means of a welding machine.

(i) The pipe of the desired length is cut using the pipe scissors.

(ii) The proper heating piece is taken and mounted on the welding machine.

(iii) The welding device is switched on - control lamp and switch lamp will lit. when ready, control lamp gets off, which means that welding temperature of 260 degrees ± 10 degrees Celsius has been reached. The pipe end and the fitting to be welded are heated on the welding machine. When heated up the pipe and the fitting is removed from the welding machine and the two pieces connected together by applying a little pressure without twisting.

(iv) The joint is allowed to cool done for a few seconds.

(v) The same method shall be adapted for exposed as well as concealed fittings.

13.B **Measurement**: -

(i) The net length of pipes as laid or fixed shall be measured in running meters correct to a cm for the finished work, which shall include PP-R pipe and fittings including plain fittings and Chrome Plated Brass Threaded fittings.

(ii) Deductions for the length of valves shall be made.

(iii) The cost includes cutting chases in the masonry wall and making good the same, trenching, refilling and testing of joints.

(iv) The cost of gate valves/wheel valves/union shall be paid for separately.

14 **CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPES: -**

(i) CPVC pipes and fitting shall conform to IS 15778.

(ii) The internal and external surfaces of the pipes shall be smooth, clean and free from grooving and other defects.

(iii) **Hydrostatic Characteristics**: -

When subject to internal hydrostatic pressure test in accordance with the procedure given in IS 12235 (part 8 / sec 1), the pipe shall not fail during the prescribed test duration.

14.A **FITTINGS: -**

The fitting shall be as follows:-

(i) Plain CPVC solvent cement fitting from size 15mm to 160 mm.

(ii) Brass threaded fitting.

(iii) Valve from size 15mm to 160mm.

14.B **Measurement**: -

The net length of pipes as laid or fixed shall be measured in running meters correct to a cm for the finished work, including CPVC pipe, fittings, plain & Brass threaded fittings and jointing solvent cement.

15 **PE-AL-PE (Polyethylene-Aluminum-Polyethylene) PIPES** : -

(i) PE-AL-PE shall be as per IS 15450-2004.

(ii) Pipes are bonded , multilayer pipes consisting os metal aluminium and polyethylene. It is bonded with adhesive bothe internally and externally by polyethylene coating. The layes of PE-AL-PE pipes are as below:-

(a) The interior layer of polyethylene

(b) The adhesive layer

(c) Aluminium tube

(d) The adhesive layer

(e) The external layer of polyethylene

15.A **FITTINGS: -**

Compraction joints fitting should be used for PE-AL-PE pipes which may be brass,composite and composite external sealing.Either of these fittings should be used. The external sealing fitting should be used for cold water application.

15.B **JOINTING** :-

For leak proof and strong joint of pipe following steps are taken.

(a) Cut the pipe square by cutter to the required and proper length.

(b) Select the fitting to be used and dismantle its nuts and split rings.

(c) Place the nut and split ring over the pipe. Ensure that “O” rings are in proper position of insert.

(d) Prepare the end of pipe to be jointed for roundness and chamfer by using beveling tool. Push the pipe over the insert and inside the support groove fully.

(e) Push the split ring and nut towards connector till split ring touches the support groove.

(f) Tighten the nut over connector with spanner.

15.C **Measurement : -**

The net length of pipes as laid or fixed shall be measured in running meters correct to a cm for the finished work, which shall including fittings.

16 **Rates**

Rates include labour material and equipments required for complete items.

Note:- Please refer for other items of water supply refer chapter number 1 to 7 of SSR volume "A" (Water supply Sewerage, Drainage & Tube well)

(For Detail Refer to Specification prepared by the Urban Administration and Development Department, IS Code & CPHEEO / CPWD Specifications)

CHAPTER 23 -- BUILDING WATER SUPPLY			
S.No.	**Items**	**Unit**	**Rates in Rs.**
23.1	Providing and fixing Polyethelene-Aluminium-Polyethelene (PE-AL-PE) Composite Pressure Pipes conforming to IS -15450 UV. stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperatureup to 80^{o}C includingall special fittings of composite material (engineering plastic blend and brass inserts wherever required)e.g.elbows, tees, reducers,couplers & connectors etc. with clamps at 1.00 meter spacing. This includes testing of joints complete as per direction of the Engineer in charge. **Internal work - Exposed on wall**.		
23.1.1	1216 (16 mm OD) pipe	Meter	138.00
23.1.2	1620 (20 mm OD) pipe	Meter	164.00
23.1.3	2025 (25 mm OD) pipe	Meter	209.00
23.1.4	2532 (32 mm OD) pipe	Meter	305.00
23.1.5	3240 (40 mm OD) pipe	Meter	494.00
23.1.6	4050 (50 mm OD) pipe	Meter	660.00
23.2	Providing and fixing Polyethelene-Aluminium-Polyethelene (PE-AL-PE) Composite Pressure Pipes conforming to IS - 15450 U.V.stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature up to 80^{o}C including all special fittings of composite material (engineering plastic blend and brass inserts wherever required) e.g. elbows, tees, reducers,couplers & connectors etc. with clamps at 1.00 meter spacing. This includes the costs of cutting chases and including testing of joints complete as per direction of the engineer in charge. **Internal Work Exposed on wall - Concealed work including cutting chases & making good the wall etc.**		
23.2.1	1216 (16mm OD) pipe	Meter	219.00
23.2.2	1620 (20 mm OD) pipe	Meter	250.00
23.2.3	2025 (25 mm OD) pipe	Meter	306.00
23.2.4	2532 (32 mm OD) pipe	Meter	427.00
23.3	Providing & fixing Polyethelene – Aluminium - Polyethelene (PE-AL-PE) Composite Pressure Pipes conforming to IS – 15450 - 2004 U.V. stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature up to 80^{o}C including all special fittings of composite material (engineering plastic blend and brass inserts wherever required)e.g. elbows, tees, reducers, couplers & connectors etc. with trenching, refilling and testing of joints complete as per direction of the engineer in charge. **External work**		
23.3.1	1216 (16 mm OD) pipe	Meter	135.00
23.3.2	1620 (20 mm OD) pipe	Meter	158.00
23.3.3	2025 (25 mm OD) pipe	Meter	200.00
23.3.4	2532 (32 mm OD) pipe	Meter	289.00
23.3.5	3240 (40 mm OD) pipe	Meter	469.00
23.3.6	4050 (50 mm OD) pipe	Meter	635.00

S.No.	Items	Unit	Rates in Rs.
	PP- R PIPES		
23.4	Providing and fixing 3 layer PP-R (Poly propylene Random copolymer) pipes SDR 7.4 U V stabilized & anti -microbial fusion welded, having thermal stability for hot & cold water supply including all PP - R plain & brass threaded polypropylene random fittings i/c fixing the pipe with clamps at 1.00 m spacing. This includes testing of joints complete as per direction of Engineer in Charge. **Internal work – Exposed on wall.**		
23.4.1	PN - 16 Pipe, 16 mm OD	Meter	79.00
23.4.2	PN - 16 Pipe, 20 mm OD	Meter	115.00
23.4.3	PN - 16 Pipe, 25 mm OD	Meter	161.00
23.4.4	PN - 16 Pipe, 32 mm OD	Meter	227.00
23.4.5	PN - 16 Pipe, 40 mm OD	Meter	345.00
23.4.6	PN - 16 Pipe, 50 mm OD	Meter	489.00
23.5	Providing and fixing 3 layer PP-R (Poly propylene Random copolymer) pipes SDR 7.4 U V stabilized & anti - microbial fusion welded, having thermal stability for hot & cold water supply including all PP - R plain & brass threaded polypropylene random fittings i/c fixing the pipe with clamps at 1.00 m spacing. This includes the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. **Concealed work including cutting chases and making good the walls etc.**		
23.5.1	PN - 16 Pipe, 16 mm OD	Meter	139.00
23.5.2	PN - 16 Pipe, 20 mm OD	Meter	185.00
23.5.3	PN - 16 Pipe, 25 mm OD	Meter	241.00
23.5.4	PN - 16 Pipe, 32 mm OD	Meter	321.00
23.6	Providing and fixing 3 layer PP-R (Poly propylene Random copolymer) pipes UV stabilized &anti-microbial fusion welded, having thermal stability for hot & cold water supply including all PP-R plain & brass threaded polypropylene random fittings including trenching ,refilling & testing of joints complete as per direction of Engineer in Charge. **External work**		
23.6.1	PN - 16 Pipe, 16 mm OD (SDR – 7.4)	Meter	76.00
23.6.2	PN - 16 Pipe, 20 mm OD (SDR – 7.4)	Meter	109.00
23.6.3	PN - 16 Pipe, 25 mm OD (SDR – 7.4)	Meter	154.00
23.6.4	PN - 16 Pipe, 32 mm OD (SDR – 7.4)	Meter	213.00
23.6.5	PN - 16 Pipe, 40 mm OD (SDR – 7.4)	Meter	320.00
23.6.6	PN - 16 Pipe, 50 mm OD (SDR – 7.4)	Meter	464.00
23.6.7	PN - 16 Pipe, 63mm OD (SDR – 7.4)	Meter	736.00
23.6.8	PN - 16 Pipe, 75 mm OD (SDR – 7.4)	Meter	1099.00
23.6.9	PN - 16 Pipe, 90 mm OD (SDR – 7.4)	Meter	1605.00
23.6.10	PN - 10 Pipe, 110 mm OD (SDR - 11)	Meter	2432.00
23.6.11	PN - 10 Pipe, 160 mm OD (SDR - 11)	Meter	5049.00

S.No.	Items	Unit	Rates in Rs.
23.7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plane and brass threaded fitting i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. **Internal work - Exposed on wall.**		
23.7.1	15 mm nominal outer dia .Pipes.	Meter	87.00
23.7.2	20 mm nominal outer dia .Pipes.	Meter	112.00
23.7.3	25 mm nominal outer dia .Pipes.	Meter	140.00
23.7.4	32 mm nominal outer dia .Pipes.	Meter	186.00
23.7.5	40 mm nominal outer dia .Pipes.	Meter	303.00
23.7.6	50 mm nominal outer dia .Pipes.	Meter	436.00
23.8	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. **Concealed work including cutting chases and making good the walls etc.**		
23.8.1	15 mm nominal outer dia .Pipes.	Meter	147.00
23.8.2	20 mm nominal outer dia .Pipes.	Meter	175.00
23.8.3	25 mm nominal outer dia .Pipes.	Meter	213.00
23.8.4	32 mm nominal outer dia .Pipes.	Meter	266.00
23.9	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement ,trenching ,refilling & testing of joints complete as per direction of Engineer in Charge. **External work**		
23.9.1	15 mm nominal outer dia .Pipes.	Meter	81.00
23.9.2	20 mm nominal outer dia .Pipes.	Meter	102.00
23.9.3	25 mm nominal outer dia .Pipes.	Meter	133.00
23.9.4	32 mm nominal outer dia .Pipes.	Meter	172.00
23.9.5	40 mm nominal outer dia .Pipes.	Meter	278.00
23.9.6	50 mm nominal outer dia .Pipes.	Meter	411.00
23.9.7	62.50 mm nominal inner dia Pipes.	Meter	1346.00
23.9.8	75 mm nominal inner dia .Pipes.	Meter	1756.00
23.9.9	100mm nominal inner dia .Pipes.	Meter	2435.00
23.9.10	150 mm nominal inner dia .Pipes.	Meter	4228.00

S.No.	Items	Unit	Rates in Rs.
23.10	Providing and fixing medium grade G.I. pipes medium class (ISI mark) complete with G.I. fittings (ISI mark) and clamps, including cutting and making good the walls etc. **Internal work – Exposed on wall**.		
23.10.1	15 mm dia. nominal bore	Meter	139.00
23.10.2	20 mm dia. nominal bore	Meter	172.00
23.10.3	25 mm dia. nominal bore	Meter	232.00
23.10.4	32 mm dia. nominal bore	Meter	288.00
23.10.5	40 mm dia. nominal bore	Meter	347.00
23.10.6	50 mm dia. nominal bore	Meter	441.00
23.11	Concealed pipe including painting with anti corrosive bitumastic paint, cutting chases and making good the wall.		
23.11.1	15 mm dia nominal bore	Meter	188.00
23.11.2	20 mm dia nominal bore	Meter	217.00
23.12	Providing and fixing G.I. pipes medium class complete with G.I. fittings as per IS : 1239 (Part-2) including trenching and refilling etc. **External work**		
23.12.1	15 mm dia. nominal bore	Meter	124.00
23.12.2	20 mm dia. nominal bore	Meter	150.00
23.12.3	25 mm dia. nominal bore	Meter	204.00
23.12.4	32 mm dia. nominal bore	Meter	247.00
23.12.5	40 mm dia. nominal bore	Meter	290.00
23.12.6	50 mm dia. nominal bore	Meter	361.00
23.12.7	65 mm dia. nominal bore	Meter	455.00
23.12.8	80 mm dia. nominal bore	Meter	588.00
23.13	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete :		
23.13.1	25 to 40 mm nominal bore	each	219.00
23.13.2	50 to 80 mm nominal bore	each	604.00
23.14	Fixing water meter and stop cock in G.I. pipe line including cutting and threading the pipe and making long screws etc. complete (cost of water meter and stop cock to be paid separately).	Each	170.00
	BRASS FITTINGS		
23.15	Providing and fixing brass bib cock of approved quality :		
23.15.1	15 mm nominal bore 0.40kg	each	224.00
23.15.2	20 mm nominal bore 0.75kg	each	268.00
23.16	Providing and fixing brass stop cock of approved quality :		
23.16.1	15 mm nominal bore 0.40kg	each	224.00
23.16.2	20 mm nominal bore 0.75kg	each	268.00

S.No.	Items	Unit	Rates in Rs.
23.17	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end):		
23.17.1	15 mm nominal bore	each	135.00
23.17.2	20 mm nominal bore	each	211.00
23.17.3	25 mm nominal bore	each	245.00
23.17.4	32 mm nominal bore.	each	373.00
23.17.5	40 mm nominal bore	each	493.00
23.17.6	50 mm nominal bore	each	744.00
23.17.7	65 mm nominal bore	each	1401.00
23.17.8	80 mm nominal bore	each	2199.00
23.18	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :		
23.18.1	15 mm nominal bore	each	250.00
23.18.2	20 mm nominal bore	each	365.00
23.18.3	25 mm nominal bore	each	423.00
23.19	Providing and fixing gun metal non- return valve of approved quality (screwed end) :		
23.19.1	**25 mm nominal bore**		
23.19.1.1	Horizontal	each	336.00
23.19.1.2	Vertical	each	368.00
23.19.2	**32 mm nominal bore**		
23.19.2.1	Horizontal	each	427.00
23.19.2.2	Vertical	each	536.00
23.19.3	**40 mm nominal bore**		
23.19.3.1	Horizontal	each	569.00
23.19.3.2	Vertical	each	697.00
23.19.4	**50 mm nominal bore**		
23.19.4.1	Horizontal	each	852.00
23.19.4.2	Vertical	each	973.00
23.19.5	**65 mm nominal bore**		
23.19.5.1	Horizontal	each	1460.00
23.19.5.2	Vertical	each	1678.00
23.19.6	**80 mm nominal bore**		
23.19.6.1	Horizontal	each	2088.00
23.19.6.2	Vertical	each	2740.00
23.20	Providing and fixing brass ferrule with C.I. mouth cover including boring and tapping the main :		
23.20.1	15 mm nominal bore	Each	158.00
23.20.2	20 mm nominal bore	Each	211.00
23.20.3	25 mm nominal bore	Each	275.00
23.21	Providing and fixing uplasticised PVC connection pipe with brass unions		
23.21.1	**30 cm length**		
23.21.1.1	15 mm nominal bore	Each	39.00
23.21.1.2	20 mm nominal bore	Each	48.00

S.No.	Items	Unit	Rates in Rs.
23.21.2	**45 cm length**		
23.21.2.1	15 mm nominal bore	Each	50.00
23.21.2.2	20 mm nominal bore	Each	64.00
23.22	Providing and fixing C.P. brass shower rose with 15 or 20 mm inlet :		
23.22.1	100 mm diameter	Each	583.00
23.22.2	150 mm diameter	Each	776.00
23.23	Painting G.I. pipes and fittings with synthetic enamel white paint over a ready mixed priming coat, both of approved quality for new work :		
23.23.1	15 mm diameter pipe.	Meter	6.00
23.23.2	20 mm diameter pipe.	Meter	7.00
23.23.3	25 mm diameter pipe.	Meter	9.00
23.23.4	32 mm diameter pipe.	Meter	11.00
23.23.5	40 mm diameter pipe.	Meter	12.00
23.23.6	50 mm diameter pipe.	Meter	15.00
23.24	Repainting G.I. pipes and fittings with synthetic enamel white paint of approved quality :		
23.24.1	15 mm diameter pipe.	Meter	3.00
23.24.2	20 mm diameter pipe.	Meter	3.00
23.24.3	25 mm diameter pipe	Meter	4.00
23.24.4	32 mm diameter pipe	Meter	5.00
23.24.5	40 mm diameter pipe	Meter	6.00
23.24.6	50 mm diameter pipe	Meter	7.00
23.25	Painting G.I. pipes and fittings with two coats of anticorrosive bitumastic paint of approved quality :		
23.25.1	15 mm diameter	Meter	3.00
23.25.2	20 mm diameter pipe	Meter	4.00
23.25.3	25 mm diameter pipe	Meter	5.00
23.25.4	32 mm diameter pipe	Meter	6.00
23.25.5	40 mm diameter pipe	Meter	7.00
23.25.6	50 mm diameter pipe	Meter	8.00
23.25.7	65 mm diameter pipe	Meter	10.00
23.25.8	80 mm diameter pipe	Meter	12.00
23.26	Providing and fixing G.I. Union (ISI mark) in G.I. pipe line including cutting and threading the pipe and making long screws etc complete **(new work) :**		
23.26.1	15 mm nominal bore.	each	92.00
23.26.2	20 mm nominal bore.	each	117.00
23.26.3	25 mm nominal bore.	each	128.00
23.26.4	32 mm nominal bore.	each	147.00
23.26.5	40 mm nominal bore.	each	193.00
23.26.6	50 mm nominal bore.	each	271.00
23.26.7	65 mm nominal bore.	each	469.00
23.26.8	80 mm nominal bore.	each	585.00

S.No.	Items	Unit	Rates in Rs.
23.27	Providing and fixing G.I. Union (ISI mark) in existing G.I. pipe line, cutting and threading the pipe and making long screws including excavation, refilling the earth or cutting of wall and making good the same complete wherever required :		
23.27.1	15 mm nominal bore.	each	170.00
23.27.2	20 mm nominal bore.	each	195.00
23.27.3	25 mm nominal bore.	each	206.00
23.27.4	32 mm nominal bore.	each	225.00
23.27.5	40 mm nominal bore.	each	271.00
23.27.6	50 mm nominal bore.	each	384.00
23.27.7	65 mm nominal bore.	each	606.00
23.27.8	80 mm nominal bore.	each	698.00
23.28	Providing and placing on at all floor levels high design HDPE (polyethylene) water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	Ltr.	7.00
	C.P.BRASS FITTINGS.		
23.29	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931		
23.29.1	15 mm nominal bore.	Each	360.00
23.30	Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms.		
23.30.1	15 mm nominal bore.	Each	315.00
23.31	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.		
23.31.1	15 mm nominal bore	Each	363.00
23.32	Providing and fixing C.P. brass stop cock (concealed) of standard design and of approved make conforming to IS:8931.		
23.32.1	15 mm nominal bore.	Each	360.00
23.33	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931		
23.33.1	15 mm nominal bore	Each	401.00
23.34	54 Providing and fixing C.P. brass pillar cock approved quality and make conforming to IS:specification.		
23.34.1	15 mm nominal bore 125 mm long foam flow	Each	574.00
23.35	Providing and fixing C.P. brass base and mixer of approved quality and make conforming to IS: specification.		
23.35.1	15 mm nominal bore.	Each	1798.00

S.No.	Items	Unit	Rates in Rs.
23.36	Providing and fixing C.P. brass wall mixer of approved quality and make conforming to IS: specification.		
23.36.1	15 mm nominal bore.	Each	2053.00
23.37	Providing and fixing C.P. brass sink mixer of approved quality and make conforming to IS: specification.		
23.37.1	15 mm nominal bore.	Each	1798.00
23.38	Providing and fixing C.P. brass grating of approved quality and make conforming to IS: specification.		
23.38.1	100 mm dia.	Each	44.00
23.39	Providing and fixing C.P. brass soap container 109 mm wide,125 high and 112 mm distance from wall of standard shape with bracket of the same material with all fittings etc. of approved quality and make like Jaguor or equivalent conforming to IS:specification.	nos.	587.00
	Polytetra Methyline Tetraphthalate (PTMT) Fittings		
23.40	Providing and fixing PTMT bib cock of approved quality and colour.		
23.40.1	15mm nominal bore, 86mm long. Weighing not less than 88 gms.	Each	139.00
23.40.2	15 mm nominal bore, 122mm long. Weighing not less than 99 gms	Each	305.00
23.40.3	15 mm nominal bore, 165mm long. Weighing not less than 110 gms.	Each	218.00
23.40.4	15mm nominal bore, 90mm long. Weighing not less than 93 gms.	Each	158.00
23.41	Providing and fixing PTMT stop cock of approved quality and colour.		
23.41.1	15 mm nominal bore, 86mm long. Weighing not less than 88 gms	Each	139.00
23.41.2	20mm nominal bore, 89mm long. Weighing not less than 88 gms.	Each	171.00
23.41.3	Concealed stop cock, 15mm nominal bore, 108mm long. Weighing not less than 108 gms.	Each	224.00
23.42	Providing and fixing PTMT pillar cock of approved quality and colour .		
23.42.1	15mm nominal bore, 107mm long. Weighing not less than 110 gms.	Each	213.00
23.42.2	15mm nominal bore, 125mm long foam flow. Weighing not less than 120 gms	Each	307.00
23.43	Providing and fixing PTMT, push cock of approved quality and colour.		
23.43.1	15 mm nominal bore, 98mm long. Weighing not less than 75 gms.	Each	131.00
23.43.2	15 mm nominal bore, 80mm long. Weighing not less than 46 gms.	Each	111.00
23.44	A. Providing & fixing PTMT grating of approved quality and colour. **Circular type.**		
23.44.1.1	100 mm nominal dia.	Each	46.00
23.44.1.2	125 mm nominal dia with 25 mm waste hole	Each	54.00
23.44.2	B. Providing & fixing PTMT grating of approved quality and colour **Rectangular type with openable circular lid.**		
23.44.2.1	150 mm nominal size square 100 mm diameter of the inner hinged round grating.	Each	126.00

S.No.	Items	Unit	Rates in Rs.
	AIR VALVE AND WATER METER (BULK TYPE)		
23.45	Providing and fixing C.I. double acting air valve of approved quality with bolts, nuts, rubber insertions etc. complete (The tail pieces, tapers etc if required will be paid separately) :		
23.45.1	50 mm dia	Each	2124.00
23.45.2	80 mm dia	Each	3053.00
23.45.3	100 mm dia	Each	3739.00
23.46	Cutting holes up to 30x30 cm in walls including making good the same **With Modular bricks**	per hole	156.00
23.47	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) including finishing complete so as to make it leak proof.	Each	101.00
23.48	Providing and fixing enclosed type water meter (bulk type) conforming to IS 2373 and tested by Engineer in charge complete with bolts & nuts rubber insertions etc.(the tail pieces if required will be paid separately)		
23.48.1	80 mm dia nominal bore	Each	2688.00
23.48.2	100 mm dia nominal bore	Each	4081.00
23.48.3	150 mm dia nominal bore	Each	5782.00
23.48.4	200 mm dia nominal bore	Each	6496.00
23.49	Providing and fixing C.I. dirt box strainer for bulk type water meter with bolts & nuts rubber insertions etc.complete conforming to IS 2373 :		
23.49.1	80 mm dia nominal bore	Each	3424.00
23.49.2	100 mm dia nominal bore	Each	5136.00
23.49.3	150 mm dia nominal bore	Each	6677.00
23.49.4	200 mm dia nominal bore	Each	9245.00
23.50	Constructing one brick masonry chamber 30x30x50 cm inside, with 25 class designation modular brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for stop cock,with C.I. surface box 100x100x75 mm (inside) with hinged cover fixed in slab of cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) necessary excavation 75 mm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) & inside plastering with cement mortar 1:3 (1 cement : 3 sand) 12 mm thick finished with a floating coat of neat cement complete as per standard disign :	Each	1068.00

S.No.	Items	Unit	Rates in Rs.
23.51	Constructing one brick masonry chamber 60x60x75 cm inside, with 25 class designation modular brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluilce valve, with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid. RCC top slab of Cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) along with necessary excavation, 100 mm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) & inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design. :	Each	5565.00
23.52	Constructing one brick masonry chamber 90x90x100 cm inside, with 25 class designation modular brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid. RCC top slab cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) along with necessary excavation, 100mm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design. :	Each	9751.00
23.53	Constructing one brick masonry chamber 120x120x100 cm inside, with 25 class designation moudlar brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid. RCC top slab of cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) along with necessary excavation, 100 mm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design. :	Each	13387.00
23.54	Constructing one brick masonry chamber 60x60x75 cm inside, with 25 class designation brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for fire hydrants with C.I. surface box 350x350 mm. top and 165 mm deep (inside) with chained lid. RCC top slab of cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) along with necessary excavation, 100mm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design. :	Each	5338.00

S.No.	Items	Unit	Rates in Rs.
23.55	Constructing one brick masonry chamber 60x45x50 cm inside, with 40 class designation brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for water meter complete with C.I. double flap surface box 400x200x200 mm (inside) with locking arrangement. RCC top slab of cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate) along with necessary excavation, 100mm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design.	Each	5071.00
23.56	Providing and fixing PTMT swivelling shower,15mm nominal bore,wieghing not less than 40 gms.	Each	110.00
23.57	Providing and fixing PTMT soap dish holder having length of 138 mm, breadth 102 mm height of 75mm with concealed fitting arrangements, Weighing not less than 106 gms.	Each	144.00
23.58	Making chases up to 7.5 x 7.5 cm in wallls including making good and finishing with matching surface after housing G.I.pipe etc.	Meter	46.00
23.59	Making chases up to 20 x 20 cm and embedding pipes up to 150 mm diameter in masonry and filling with cement concrete grade M-10 (Nominal Mix with 20mm maximum size of stone aggregate) including disposal of malba.	Meter	84.00
23.60	Providing & fixing PTMT Ball cock of approved quality, colour and make complete with epoxy coated aluminum rod with LP/HDPE plastic ball.		
23.60.1	15 mm nominal bore,105 mm long weighing not less than 138 gms.	Each	186.00
23.60.2	20 mm nominal bore,120 mm long wieghing not less than 198 gms.	Each	263.00
23.60.3	25 mm nominal bore,152mm long weighing not less than 440 gms.	Each	563.00
23.60.4	40 mm nominal bore, 206 mm long.weighing not less than 690 gms.	Each	1029.00
23.60.5	50 mm nominal bore, 242 mm long ,weighing not less than 1240 gms.	Each	1534.00
23.61	Providing and fixing PTMT angle stop cock 15 mm nominal bore. Wieghing not less than 85 gms.	Each	170.00

CHAPTER- 24
BUILDING DRAINAGE

1 Work shall be done as per specification and as per IS code given below :-

S.No.	I.S. No.	Subject
1	IS 458	Pre-cast concrete pipes (with and without reinforcement)
2	IS 651	Specification for Salt Glazed Stoneware Pipes and Fittings.
3	IS 783	Code of Practice for Laying Concrete Pipes.
4	IS 1726	Specification for Cast Iron Manhole covers and Frames
5	IS 1729	Cast Iron/Ductile Iron Drainage Pipes and Pipe Fittings Socket and Spigot series for Over-ground Non-pressure pipe line.
6	IS 4127	Code of Practice for laying of Glazed Stone Ware Pipes
7	IS 4885	Specifications for Sewer Bricks
8	IS 12592	Pre-cast concrete Manhole Covers and Frames - Specifications.

2 General Requirements :-

2.1 In designing a drainage system for buildings, the aim shall to be provide a self cleansing conduit for the conveyance of soil, waste, surface or sub-surface waters and for the removal of such wastes speedily and efficiently to a sewer or other outlet, without risk of nuisance and hazard to health.

2.2 The discharge of water through a domestic drain is intermittent and limited in quantity and therefore, small accumulations of solid matter are liable to form in the drains between the building and the public sewer. There is usually a gradual shifting of these deposits as discharges take place. Gradients shall be sufficient to prevent these temporary accumulations building up and blocking the drains.

2.3 Normally, the sewer shall be designed for discharging three times the dry weather flow flowing half-full with a minimum self cleansing velocity of 0.75 meter per second. The approximate gradients which give this velocity for the sizes of pipes likely to be used in building drainage and the corresponding discharges when flowing half-full are given in Chapter 12 Table 12.2 of the specifications. The sizes and slopes shall conform to Local Municipal Bye-laws.

2.4 In cases, where it is practically not possible to conform to the minimum gradients, a flatter gradient may be used but the minimum velocity in such cases shall in no account be less than 0.61 meters per second.

2.5 On the other hand, it is undesirable to employ gradients giving velocity of flow greater than 2.4 meters per second. Where it is unavoidable, cast iron pipes shall be used.

3 All soil waste pipes and accessories shall be of grade 'A'.

4 In brick masonry manholes/chambers, the benching of inlets and outlet lines shall not cross each other for effective drainage.

5 Soak pits shall be constructed at least 3.00 m. apart from septic tank.

6 Cast Iron manhole covers and frames shall conform to I.S. 17276-1960.

7 Septic tanks shall be constructed conforming to I.S. 2470 (Part-I) 1963.

8 Centre to centre spacing of each manhole shall not exceed 6.00m.

9 Measurement :-
The lengths of pipes shall be measured in running meters nearest to a cm as laid or fixed, from inside of one manhole to the inside of the other manhole. The length shall be taken along the centre line of the pipes. All fittings such as bends, collars, junctions, etc. which shall not be measured separately.

10 Rates :-
The rate shall include the cost of materials and labour involved in all the operation described in the items.

(For Detail Refer to Specification prepared by the Urban Administration and Development Department, IS Code & CPHEEO Specifications)

CHAPTER 24 -- DRAINAGE			
S.No.	**Items**	**Unit**	**Rate (Rs.)**
24.1	Providing and fixing square-mouth S.W. gully trap grade 'A'' complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design : With Modular Bricks class designation 40.		
24.1.1	100 x 100 mm size P type	Each	1372.00
24.1.2	150 x 100 mm size P type.	Each	1393.00
24.1.3	180 x 150 mm size P type.	Each	1495.00
24.2	Dismantling of old S.W. pipes including breaking of joints and bed concrete stacking of useful materials near the site within 50 m lead and disposal of unserviceable materials into municipal dumps:		
24.2.1	100 mm diameter	Meter	17.00
24.2.2	150 mm diameter	Meter	19.00
24.2.3	200 mm diameter	Meter	20.00
24.2.4	230 mm diameter	Meter	21.00
24.2.5	250 mm diameter	Meter	22.00
24.2.6	300 mm diameter	Meter	23.00
24.2.7	350 mm diameter	Meter	26.00
24.2.8	400 mm diameter	Meter	29.00
24.2.9	450 mm diameter	Meter	30.00
24.3	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :		
24.3.1	100 mm dia. R.C.C. pipe	Meter	212.00
24.3.2	150 mm dia. R.C.C. pipe	Meter	268.00
24.3.3	250 mm dia. R.C.C. pipe	Meter	458.00
24.3.4	300 mm dia. R.C.C. pipe	Meter	486.00
24.3.5	450 mm dia. R.C.C. pipe	Meter	765.00
24.3.6	500 mm dia. R.C.C. pipe	Meter	1014.00
24.3.7	600 mm dia. R.C.C. pipe	Meter	1175.00
24.3.8	700 mm dia. R.C.C. pipe	Meter	1400.00
24.3.9	800 mm dia. R.C.C. pipe	Meter	1972.00
24.3.10	900 mm dia. R.C.C. pipe	Meter	2367.00
24.3.11	1000 mm dia. R.C.C. pipe	Meter	2753.00
24.3.12	1100 mm dia. R.C.C. pipe	Meter	3084.00
24.3.13	1200 mm dia. R.C.C. pipe	Meter	3842.00

S.No.	**Items**	**Unit**	**Rate (Rs.)**
24.4	Constructing brick masonry moudlar brick class designation 40 manhole in cement mortar 1:4 (1 cement : 4 sand) R.C.C. top slab with Cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate), 20 cm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 sand) finished with floating coat of neat cement and making channels in cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) as per standard design. The sizes of manhole and manhole covers as detailed below.		
24.4.1	Manhole inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) :	Each	7377.00
24.4.2	Manhole inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg)	Each	16268.00
24.4.3	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (heavy duty) 560 mm internal diameter, total weight of cover and frame to be not less than 208 kg (weight of cover 108 kg and weight of frame 100 kg)	Each	20521.00
24.5	Extra for depth for manholes. With Modular bricks class designation 40		
24.5.1	Size 90x80 cm	meter	4881.00
24.5.2	Size 120x90 cm	meter	5840.00
24.6	Constructing brick masonry circular type manhole 0.91m internal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement :4 sand), in side cement plaster 12mm thick with cement mortar 1:3 (1 cement : 3 sand) finished with a floating coat of neat cement, foundation concrete grade M-10 (Nominal Mix with 40mm maximum size of stone aggregate), and making necessary channel in cement concrete grade M-15 (Nominal Mix with 40mm maximum size of stone aggregate) coat of neat cement all complete as per standard design : With Modular bricks class designation 40.		
24.6.1	0.91 m deep with S.F.R.C. cover and frame (heavy duty, HD-20 grade designation) 560mm internal diameter conforming to I.S. 12592, total-weight of cover and frame to be not less than 182kg., fixed in cement concrete grade M-15 (Nominal Mix with 40mm maximum size of stone aggregate) including centering shuttering all complete. (Excavation, foot rests and 12mm thick cement plaster at the external surface shall be paid for separately).	Each	7045.00
24.7	Supplying and fixing C.I. cover without frame for manholes :		
24.7.1	455x610 mm rectangular C.I. cover (light duty) the weight of the cover to be not less than 23 kg.	Each	1476.00

S.No.	**Items**	**Unit**	**Rate (Rs.)**
24.7.2	500 mm diameter C.I. cover (medium duty) the weight of the cover to be not less than 58 kg.	Each	3644.00
24.7.3	560 mm diameter C.I. cover (heavy duty) the weight of the cover to be not less than 108 kg.	Each	5941.00
24.8	Supplying and fixing C.I. cover 300x300 mm without frame for gully trap (standard pattern) the weight of cover to be not less than 4.5kg.	Each	265.00
24.9	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 sand) finished with a floating coat of neat cement and making necessary channels for the drain etc. complete :		
24.9.1	For pipes 100 to 250 mm diameter	Each	201.00
24.9.2	For pipes 250 to 300 mm diameter	Each	261.00
24.9.3	For pipes 350 to 450 mm diameter	Each	392.00
24.10	Constructing brick masonry road gully chamber 50x45x60 cm with bricks of class designation 40 in cement mortar 1:4 (1 cement : 4 sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame (minimum weight of grating 75 kg) complete as per standard design :		
24.10.1	With Modular bricks	Each	3258.00
24.11	Constructing soak pit 1.20x1.20x1.20m filled with brickbats including S.W. drain pipe 100 mm diameter and 1.20 m long complete as per standard design.		
24.11.1	20 m long	Each	1776.00
24.12	Providing and fixing S.W. intercepting trap in manholes with stiff mixture of cement mortar 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :		
24.12.1	100 mm dia	Each	72.00
24.12.2	150 mm dia	Each	334.00
24.13	Providing and laying below ground unplasticised PVC pipe to with stand working pressure of 4 kg/cm2 soild waste pipes confirming to IS:13592 and IS:4985 including jointing with seal ring confirming to IS :5282 leaving 10mm gap for thermal expansion all necessary fittings etc. complete.		
24.13.1	110 mm diameter OD	Each	159.00
24.13.2	160 mm diameter OD	Each	353.00

S.No.	**Items**	**Unit**	**Rate (Rs.)**
24.14	Constructing brick masonry circular manhole 1.52m internal dia at bottom and 0.56m dia at top in cement mortar 1:4 (1 cement : 4 sand) inside cement plaster 12mm thick with cement mortar 1:3 (1 cement : 3 sand) finished with a floating coat of neat cement, foundation concrete grade M-10 (Nominal Mix with 40mm maximum size of stone aggregate) and making necessary channel in cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) finished with a floating coat of neat cement all complete as per standard design : with Modular bricks class designation 40.		
24.14.1	2.30 m deep with SFRC Cover and frame (heavy duty HD-20 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg.fixed in cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) including centering shuttering all complete.(excavation,foot rests and 12mm thick cement plaster at the external surface shall be paid for sepately)	Each	29000.00
24.15	Extra depth for circular type manhole 1.52 m internal dia (at bottom) beyond 2.30 m to 2.29 m : with Modular bricks class designation 40.	Meter	13104.00
24.16	Constructing brick masonry circular manhole 1.22m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement : 4 sand) inside cement plaster 12mm thick with cement mortar 1:3 (1 cement : 3 sand) finished with a floating coat of neat cement foundation cocrete grade M-10 (Nominal Mix with 40mm maximum size of stone aggregate) and making necessary channel in cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) finished with a floating coat of neat cement all complete as per standard design : With Modular bricks class designation 40.		
24.16.1	1.68 m deep with SFRC Cover and frame (heavy duty HD-20 grade designation) 560mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182kg. fixed in cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) including centering shuttering all complete. (Excavation, foot rests and 12 mm thick cement plaster at the external surface shall be paid for separately):	Each	13340.00
24.17	Extra depth for circular type manhole 1.22 m internal dia (at bottom) beyond 1.68 m to 2.29 m : with Modular bricks class designation 40.	Each	5404.00

S.No.	**Items**	**Unit**	**Rate (Rs.)**
24.18	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block grade M-10 (Nominal Mix with 20mm maximum size of stone aggregate) complete as per design.	Each	217.00
24.19	Replacement of M.S. foot rests in manholes including dismantling concrete blocks and fixing with 20x20x10 cm cement concrete blocks grade M-10 (Nominal Mix with 20mm maximum size of stone aggregate) :		
24.19.1	with 20x20 mm square bar	Each	198.00
24.19.2	with 20 mm diameter square round bar	Each	171.00
24.20	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of require shape and approved quality.		
24.20.1	**LD - 2.5**		
24.20.1.1	Rectangular shape 600x450 mm internal dimensions	Each	1033.00
24.20.1.2	Square shape 450 mm internal dimensions	Each	876.00
24.20.1.3	Circular shape 450 mm internal diameter	Each	787.00
24.20.2	**M D - 10**		
24.20.2.1	Square shape 450 mm internal dimensions	Each	973.00
24.20.2.2	Circular shape 500 mm internal diameter	Each	931.00
24.20.3	**H D - 20**		
24.20.3.1	Circular shape 560 mm internal diameter	Each	1298.00
24.20.4	**E H D - 35**		
24.20.4.1	Circular shape 560 mm internal diameter	Each	1422.00
24.21	Supplying and fixing C.I.cover 300x300 mm without frame for gulty trap (standard pattern) the weight of cover to be not less than 4.5 kg.	Each	265.00
24.22	Dismentling of manhole including R.C.C top slab.C.I.cover with frame including stacking of useful materials near the site and disposal of unserviceable materials with in 50 m lead.:		
24.22.1	Rectangular manhole 90x80 cm and 45 cm deep	Each	576.00
24.22.2	Rectangular manhole 120x90 cm and 90 cm deep	Each	1013.00
24.22.3	Rectangular arch type manhole 140x90 cm and 2.45 m deep	Each	1676.00
24.22.4	Circular manhole 122 cm diameter and 1.68 and deep.	Each	1055.00
24.23	Extra for depth of manholes dismantled :		
24.23.1	Rectangular manhole 90x80 cm and 45 cm deep	Meter	399.00
24.23.2	Rectangular manhole 120x90 cm and 90 cm deep	Meter	475.00

S.No.	**Items**	**Unit**	**Rate (Rs.)**
24.23.3	Rectangular arch type manhole 140x90 cm and 2.45 m deep (up to 4.25 m depth)	Meter	693.00
24.23.4	Circular manhole 1.22 m diameter and 1.68 m deep.(up to 2.29 m depth)	Meter	1306.00
24.24	Raising manhole cover and frame slab to required level including dismantling existing slab and making good the damage as required (Raising depth of manhole to be paid separately) :		
24.24.1	Rectangular manhole 90x80 cm with rectangular cover 600 x 450 mm of grade LD-2.5	Each	1114.00
24.24.2	Rectangular manhole 120x90 cm with circular cover 500 mm dia of grade MD-10	Each	1739.00
24.24.3	Rectangular manhole 120x90 cm with circular cover 560 mm dia of grade HD-20	Each	1615.00
24.24.4	Circular manhole 140 cm dia with circular cover 600 mm dia of grade EHD-35	Each	133.00
24.25	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with 40 class designation bricks in cement mortar 1:4:(1 cement : 4 sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total wieght of cover with frame to be not less than 38 kg (weight of cover 23 kg and wieght of frame 15 kg) RCC top slab with cement concrete grade M-20 (Nominal Mix with 20mm maximum size of stone aggregate), 15 cm thick foundation concrete grade M-7.5 (Nominal Mix with 40mm maximum size of stone aggregate), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design. The sizes of chambers as under :		
24.25.1	Chamber inside dimensions 455x610 mm and 45 cm deep for single pipe line	Each	4298.00
24.25.2	Chamber nside dimensions 500 x 700 mm and 45 cm deep for pipe line with one or two inlets :	Each	4928.00
24.25.3	Chamber inside dimensions 600 x 850 mm and 45 cm deep for pipe line with three or more inlets :	Each	5649.00
24.26	Extra for depth beyond 45 cm of brick masonry chamber at 12.25.1 to 12.25.3 :		
24.26.1	455 x 610 mm	Meter	3412.00
24.26.2	500 x 700 mm	Meter	3717.00
24.26.3	600 x 850 mm	Meter	4321.00
24.27	Making soak pit 2.5 m diameter 3.0 meter deep with 45 x 45 cm dry brick honey comb shaft with bricks of class designation 40 and S.W. drain pip 100 mm diameter, 1.8 m long complete. Over the filling shall be placed single matting which shall be covered with minimum layer of 7.5 cm earth. The shaft be covered with 7.5 cm thick stone or R.C.C. slab 10 cm wide and 10 cm deep brick edging with bricks of class designation 40 shall be provided round the pit. The connection of the open surface drain to the soak pit shall be made by means of 100 mm diameter S.W. pipe with open joints, as per standard design. (Fig 2.25)	Each	12676.00

CHAPTER- 25
SANITARY INSTALLATION

1 **Sanitary Material work shall be as per Specification of IS Code Listed below**

S.No.	*Subject*	*I.S. Code No.*
1	Specification for glazed fire clay sanitary appliances: Part 1 : General requirements.	IS 771 (Pt.1)
2	Specification for glazed fire day sanitary appliances : Part 2 : Specific requirements of kitchen and laboratory sink.	IS 771 (Pt.2)
3	Specific action for general requirements for enameled cast iron sanitary appliances.	IS 772
4	Flushing cisterns for water closets and urinals (Other than plastic cistern)- Specifications.	IS 774
5	Phenolic moulding materials - Specification	IS 1300
6	Water fittings - copper allow float valves (horizontal plunger type) - Specifications	IS 1703
7	Cast Iron/Ductile Iron Drainage Pipes and pipe fittings for Over ground non-pressure pipe line socket and spigot series.	IS 1729
8	Specification for pillar taps for water supply purposes.	IS 1795
9	Polystyrene moulding and extrusion materials - Specifications	IS 2267
10	Specification for Automatic Flushing Cisterns for Urinals (Other than plastic cisterns)	IS 2326
11	Plastic seats and covers for water closets Part 1 : Thermo set seats and covers - Specifications	IS 2548 (Part-1)
12	Plastic seats and covers for water closets Part 2: Thermoplastic seats and covers - Specifications	IS 2548 (Part-2)
13	Vitreous Sanitary appliances (Vitreous china) - Specifications	IS 2556
14	Part 1 : General requirements	IS 2556 (Part-1)
15	Part 2 : Specific requirements of wash-down water closets.	IS 2556 (Part-2)
16	Part 3: Specific squatting pans.	IS 2556 (Part-3)
17	Part 4: Specific requirements of wash basins.	IS 2556 (Part-4)
18	Part 5 : Specific requirements of laboratory sinks.	IS 2556 (Part-5)
19	Part 6: Specific requirements of Urinals & Partition Plates	IS 2556 (Part-6)
20	Part 7 : Specific requirements of accessories for sanitary appliances.	IS 2556 (Part-7)
21	Part 14: Specific requirements of integrated squatting pans.	IS 2556 (Part-14)
22	Part 15 : Specific requirements of universal water closets.	IS 2556 (Part-15)
23	Specifications for Copper alloy waste fittings for wash basins and sinks.	IS 2963
24	Specifications for low density polyethylene pipes for potable water supplies.	IS 3076
25	Urea formaldehyde moulding materials - Specifications	IS 3389
26	Specifications for centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes fittings and accessories.	IS 3989
27	Specification for electroplated coating of nickel and chromium on copper and copper alloys.	IS 4827

28	Specifications for high density polyethylene pipes for potable water supplies.	IS 4984
29	Unplasticized P.V.C. pipes for potable water supply - Specifications.	IS 4985
30	Plastic flushing cisterns for water closets and urinals - Specifications	IS 7231
31	Stainless steel sinks for domestic purposes - Specifications.	IS 13983

2 All joints shall be made with special care, particularly those between pipes of different material. All joints shall be perfectly air and water tight. No joint shall be embedded in wall at any cost.

3 Flushing Cisterns

The flushing cisterns shall be automatic or manually operated high level or low level as specified, for water closets and urinals. A high level cistern is intended to operate with minimum height of 125 cm and a low level cistern with a maximum height of 30 cm between the top of the pan and the under side of the cistern.

Cisterns shall be of following type (i) Vitreous China (IS 774) for Flushing type (ii) Automatic Flushing Cistern (IS 2326) and (iii) Plastic cisterns (IS 7231).

4 All exposed G.I., C.I. or lead pipes and fittings shall be painted with approved quality of paint.

5 All sanitary and plumbing work shall be carried out through licensed plumbers.

6 Fixing of Urinal Lipped, Half Stall (Single or Range)

Urinals shall be fixed in position by using wooden plugs and screws. It shall be at a height of 65 cm from the standing level to the top of the lip of the urinal, unless otherwise directed by the Engineer-in-Charge. The size of wooden plugs shall be 50 mm x 50 mm at base tapering to 38 mm x 38 mm at top and of length 5.0 cms. These shall be fixed in the wall in cement mortar 1:3 (1 cement : 3 fine sand). After the plug fixed in the wall, the mortar shall be cured till it is set.

6.1 Fixing of Stall Urinal (Single or Range)

The floor slab shall be suitably sunk to receive the stall urinal. Where the floor slab is not sunk, the stall urinal shall be provided over a platform. The lip of the stall urinal shall be flush with the finished floor level adjacent to it. The stall urinal shall be laid over a fine sand cushion of average 25 mm thickness. A space of not less than 3 mm shall be provided all-round, in front, side and filled with water proofing plastic compound. Care shall be taken that after the sub-grade for the floor is cast, one week should lapse before urinals are installed. The trap and fittings shall be fixed as directed by the Engineer-in-Charge. Payment for the floor and its sub-grade shall be made separately.

6.2 Fixing of Wash Basin

6.2.1 The installation shall consist of an assembly of wash basin, pillar taps, C.I. brackets, C.P. brass of P.V.C. union, as specified. The wash basin shall be provided with one or two 15mm C.P. brass pillar taps, as specified. The height of top of the rim of wash basin from the floor level shall be within 750mm to 800 mm.

6.2.2 The basin shall be supported on a pair C.I. cantilever brackets conforming to IS 775 and shall be embedded in cement concrete (1:2:4) block 100 x 75 x 150 mm. Use of M.S. angle or Tee section as bracket is not permitted. Brackets shall be fixed in position before dado work is done. The wall plaster on the rear shall be cut to rest over the top edge of the basin so as not to leave any gap for water to seep through between wall plaster & skirting of basin. After fixing the basin, plaster shall be made good and surface finished matching with the existing one. S.C.I. floor traps conforming to IS 1729 having 50 mm water seal (minimum 35 mm in two pipe systems with gully trap) should be used. Waste pipes laid horizontally should have gradient not flatter than 1 in 50 and not steeper than 1 in 10.

7 Inatallation of Squatting Pan & Water Closet shall be done as per Specifications.

8 Measurement

(i) The pipes shall be measured net when fixed in position excluding all fittings along its length, correct to a cm. When collars are used for jointing SCI pipes these shall be measured as fittings and shall be paid for separately. No allowance shall be made for the portions of the pipe lengths entering the sockets of the adjacent pipes or fittings. The above shall apply to both cases i.e. whether the pipes are fixed on wall face or embedded in masonry. No deduction shall be made in the former case from the masonry measurement for the volume of concrete blocks embedded therein. Similarly no deduction shall be made for the volume occupied by the pipes from the masonry when the former are embedded in the later.

(ii) Sinks, urinals, squatting pan, basins, water closets, foot rest (pair) etc. shall be measured in nos.

9 Rates :-

Rate include the cost of all the materials and labour involved for the completion of items.

(For Detail Refer to Specification prepared by the Urban Administration and Development Department, IS Code & CPHEEO Specifications)

CHAPTER 25 - SANITARY INSTALLATION			
S.No.	**Particulars of Items**	**Unit**	**Rate in Rs**
25.1	Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete including cutting and making good the walls and floors wherever required :		
25.1.1	White Vitreous china Orissa pattern W.C. pan of size 580x440mm with integral type foot rests	Each	2698.00
25.1.2	Stainless Steel AISI-304(18/8) Orissa pattern W.C. pan of size 585x480 mm with flush pipe and integrated type foot rests	Each	6269.00
25.2	Providing and fixing white vitreous china pedestal type water closet (European type W.C. pan) with seat and lid, 10 litre low level white P.V.C. flushing cistern with manually controlled device (handle lever), conforming to IS : 7231, with all fittings and fixtures complete including cutting and making good the walls and floors wherever required :		
25.2.1	W.C. pan with ISI marked white solid plastic seat and lid	Each	2525.00
25.2.2	W.C. pan with ISI marked black solid plastic seat and lid	Each	2487.00
25.3	Providing and fixing white vitreous china pedestal type water closet (European type) with seat and lid, 10 litre low level white vitreous china flushing cistern & C.P. flush bend with fittings & C.I.brackets, 40mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete including painting of fittings and brackets, cutting and making good the walls and floors wherever required :		
25.3.1	W.C. pan with ISI marked white solid plastic seat and lid.	Each	3823.00
25.3.2	W.C. pan with ISI marked black solid plastic seat and lid.	Each	3784.00
25.4	Providing and fixing white vitreous china flat back or wall corner type lipped front urinal basin of 430x260x350mm and 340x410x265mm sizes respectively with automatic flushing cistern with standard flush pipe and C.P. brass spreaders with brass unions and G.I clamps complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required :		
25.4.1	One urinal basin with 5 litre white P.V.C. automatic flushing cistern.	Each	2246.00
25.4.2	Range of two urinal basins with 5 litre white P.V.C. automatic flushing cistern.	Each	3279.00
25.4.3	Range of three urinal basins with 10 litre white P.V.C. automatic flushing cistern.	Each	4396.00
25.4.4	Range of four urinal basins with 10 litre white P.V.C. automatic flushing cistern.	Each	5888.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.5	Providing and fixing white vitreous china flat back half stall urinal of size 580x380x350mm with white PVC automatic flushing cistern, with fittings, standard size C.P. brass flush pipe, spreaders with unions and clamps (all in C.P. brass) with waste fitting as per IS : 2556, C.I. trap with outlet grating and other couplings in C.P. brass including painting of fittings and cutting and making good the walls and floors wherever required :		
25.5.1	Single half stall urinal with 5 litre P.V.C. automatic flushingcistern.	Each	4422.00
25.5.2	Range of two half stall urinals with 5 litre P.V.C. automatic flushing cistern.	Each	7187.00
25.5.3	Range of three half stall urinals with 10 litre P.V.C. automatic flushing cistern.	Each	9399.00
25.5.4	Range of four half stall urinals with 10 litre P.V.C. automatic flushing cistern.	each	11601.00
25.6	Providing and fixing one piece construction white vitreous china squatting plate with an integral longitudinal flushing pipe, white P.V.C. automatic flushing cistern, with fittings, standard size G.I. flush pipe for back and front flush with standard spreader pipes with fittings, G.I clamps and C.P. brass coupling complete including painting of fittings and cutting and making good the walls and floors etc. wherever required :		
25.6.1	Single squatting plate with 5 litre P.V.C. automatic flushing cistern.	Each	2841.00
25.6.2	Range of two squatting plates with 5 litre P.V.C. automatic flushing cistern.	Each	4314.00
25.6.3	Range of three squatting plates with 10 litre P.V.C. automatic flushing cistern.	Each	5606.00
25.6.4	Range of four squatting plates with 10 litre P.V.C. automatic flushing cistern.	Each	6839.00
25.7	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps,32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require :		
25.7.1	White Vitreous China Wash basin size 630x450 mm with a pair of 15 mm C.P. brass pillar taps.	Each	1564.00
25.7.2	White Vitreous China Wash basin size 630x450 mm with a single 15 mm C.P. brass pillar tap.	Each	1408.00
25.7.3	White Vitreous China Wash basin size 550x400 mm with a pair of 15 mm C.P. brass pillar taps.	Each	1378.00
25.7.4	White Vitreous China Flat back wash basin size 550x400 mm with single 15 mm C.P. brass pillar tap.	Each	1223.00
25.7.5	White Vitreous China Angle back wash basin size 600x480 mm with single 15 mm C.P. brass pillar tap.	Each	1345.00
25.7.6	White Vitreous China Angle back wash basin size 400x400 mm with single 15 mm C.P. brass pillar tap.	Each	1089.00
25.7.7	White Vitreous China Flat back wash basin size 450x300 mm with single 15 mm C.P. brass pillar tap.	Each	1102.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.7.8	White Vitreous China Surgeon type wash basin of size 660x460 mm with a pair of 15 mm C.P. brass pillar taps with elbow operated levers.	Each	2650.00
25.7.9	White Vitreous China Surgeon type wash basin of size 660x460 mm with single 15 mm C.P. brass pillar taps with elbow operated levers ISI marked.	Each	2098.00
25.7.10	Stainless Steel AISI-304(18/8) Round basin 405x355mm with single 15 mm C.P. brass pillar tap.	Each	2660.00
25.7.11	Stainless Steel AISI-304(18/8) Wash basin 530x345 mm with single 15 mm C.P. brass pillar tap.	Each	2469.00
25.8	Providing and fixing white vitreous china pedestal for wash basin completely recessed at the back for the reception of pipes and fittings.	Each	809.00
25.9	Providing and fixing kitchen sink with C.I. brackets, C.P. brass chain with rubber plug, 40 mm C.P. brass waste complete, including painting the fittings and brackets, cutting and making good the walls wherever required :		
25.9.1	White glazed fire clay kitchen sink of size 600x450x250mm.	Each	2092.00
25.10	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS 13983 with C.I. brackets and stainless steel plug 40 mm including painting of fittings and brackets, cutting and making good the walls wherever required :		
25.10.1	**Kitchen sink with drain board**		
25.10.1.1	510x1040 mm bowl depth 250mm.	Each	7260.00
25.10.1.2	510x1040 mm bowl depth 225mm.	Each	6845.00
25.10.1.3	510x1040 mm bowl depth 200mm.	Each	6174.00
25.10.1.4	460x915 mm bowl depth 178mm.	Each	4130.00
25.10.2	**Kitchen sink without drain board**		
25.10.2.1	610x510 mm bowl depth 200 mm.	Each	4066.00
25.10.2.2	610x460 mm bowl depth 200 mm.	Each	3778.00
25.10.2.3	470x420 mm bowl depth 178 mm.	Each	2558.00
25.11	Providing and fixing white vitreous china laboratory sink with C.I. brackets, C.P. brass chain with rubber plug 40mm C.P brass waste and 40mm C.P. brass trap with necessary C.P. brass unions complete including painting of fittings and brackets, cutting and making good the wall wherever required :		
25.11.1	Size 450x300x150mm	Each	1669.00
25.11.2	Size 600x450x200mm	Each	2660.00
25.12	Providing and fixing draining board with C.I. brackets including painting of rackets, cutting and making good the walls wherever required :		
25.12.1	White glazed fire clay draining board of size 600x450x25mm	Each	738.00
25.13	Providing and fixing white vitreous china water closet squatting pan (Indian type)		

S.No.	Particulars of Items	Unit	Rate in Rs
25.13.1	Long pattern W.C. pan of size 580 mm	Each	637.00
25.13.2	Orissa pattern W.C. pan of size 580x440 mm	Each	1186.00
25.14	Extra for using coloured W.C. pan instead of white W.C. pan		
25.14.1	Orissa pattern W.C. pan 580x440 mm	Each	460.00
25.15	Providing and fixing white vitreous china pedestal type (European type/ wash down type) water closet pan.	Each	982.00
25.16	Extra for using coloured pedestal type W.C pan (European type) with low level cistern of same colour instead of white vitreous china W.C pan and cistern.	Each	1048.00
25.17	Providing and fixing a pair of white vitreous china foot rests of standard pattern for squatting pan water closet:		
25.17.1	250x130x30 mm	Pair	132.00
25.17.2	250x125x25 mm	Pair	131.00
25.18	Providing and fixing P.V.C. low level flushing cistern with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete.		
25.18.1	10 litre capacity - White	Each	825.00
25.18.2	10 litre capacity - coloured	Each	923.00
25.19	Providing and fixing controlled flush, low level cistern made of vitreous china with all fittings complete.		
25.19.1	10 litre (full flush) capacity-white	Each	1375.00
25.19.2	10 litre (full flush) capacity-coloured	Each	1950.00
25.20	Providing and fixing solid plastic seat with lid for pedestal type W.C. pan complete :		
25.20.1	White solid plastic seat with lid	Each	386.00
25.20.2	Black solid plastic seat with lid	Each	348.00
25.21	Extra for providing coloured other than black solid P.V.C. plastic seat and cover in European type W.C. pan, instead of white plastic seat and cover.	Each	141.00
25.22	Providing and fixing G.I. inlet connection for flush pipe connecting with W.C. pan.	Each	85.00
25.23	Providing and fixing white vitreous china flat back or wall corner type lipped front urinal basin of 430x260x350mm and 340x410x265mm sizes respectively.	Each	681.00
25.24	Providing and fixing white vitreous china squatting plate urinal with integral rim longitudinal flush pipe.	Each	1265.00
25.25	Providing and fixing white vitreous china wash basin including making all connections but excluding the cost of fittings :		
25.25.1	Flat back wash basin of size 630x450mm.	Each	866.00
25.25.2	Flat back wash basin of size 550x400mm.	Each	680.00
25.25.3	Angle back wash basin of size 600x480mm.	Each	802.00
25.25.4	Angle back wash basin of size 400x400mm.	Each	546.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.25.5	Flat back wash basin of size 450x300mm.	Each	559.00
25.25.6	Surgeon type wash basin of size 660x460mm.	Each	1160.00
25.26	Providing and fixing kitchen sink including making all connections excluding cost of fittings.		
25.26.1	White glazed fire clay sink of size 600x450x250mm.	Each	1663.00
25.27	Providing and fixing white vitreous china laboratory sink including making all connections excluding cost of fittings:		
25.27.1	Size 450x300x150 mm.	Each	954.00
25.27.2	Size 600x450x200 mm.	Each	1938.00
25.28	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.		
25.28.1	**Semi rigid pipe**		
25.28.1.1	32 mm dia	Each	49.00
25.28.1.2	40mm dia	Each	55.00
25.28.2	**Flexible pipe**		
25.28.2.1	32mm dia	Each	54.00
25.28.2.2	40mm dia	Each	57.00
25.29	Providing and fixing 100 mm sand cast Iron grating for gully trap.	Each	19.00
25.30	Providing and fixing in position 25mm diameter mosquito proof coupling of approved municipal design.	Each	34.00
25.31	Providing and fixing 600x450 mm beveled edge 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	598.00
25.32	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 :		
25.32.1	Circular shape 450mm dia.	Each	964.00
25.32.2	Rectangular shape 453x357mm	Each	685.00
25.32.3	Oval shape 450x350mm (outer dimensions)	Each	778.00
25.32.4	Rectangular shape 1500x450 mm	Each	1729.00
25.33	Providing and fixing 600x120x5mm glass shelf with edges round of apported 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	264.00
25.34	Providing and fixing toilet paper holder :		
25.34.1	C.P. brass	Each	182.00
25.34.2	Vitreous China	Each	212.00
25.35	Providing and fixing soil, waste and vent pipes :		
25.35.1	100 mm dia		
25.35.1.1	Sand cast iron S&S pipe as per IS : 1729	meter	531.00
25.35.1.2	Centrifugally cast (spun) iron socketed pipe as per IS: 3989.	meter	860.00
25.35.2	75 mm diameter		

S.No.	Particulars of Items	Unit	Rate in Rs
25.35.2.1	Sand cast iron S&S pipe as per IS : 1729	meter	458.00
25.35.2.2	Centrifugally cast (spun) iron socketed pipe as per IS: 3989.	meter	741.00
25.36	Providing and filling the joints with spun yarn cement slurry and cement mortar 1:2 (1 cement : 2 fine sand) in S.C.I./ C.I. Pipes :		
25.36.1	75 mm dia pipe	Each	31.00
25.36.2	100mm dia pipe	Each	37.00
25.37	Providing and fixing M.S. holder-bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10cm of cement concrete grade M-15 (Nominal Mix with 20mm maximum size of stone aggregate) including cost of cutting holes and making good the walls etc. :		
25.37.1	For 100mm dia pipe	Each	81.00
25.37.2	For 75mm dia pipe	Each	78.00
25.38	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.		
25.38.1	**100 mm**		
25.38.1.1	Sand cast iron S&S as per IS - 1729	Each	293.00
25.38.1.2	Sand cast iron S&S as per IS - 3989	Each	338.00
25.38.2	**75 mm dia**		
25.38.2.1	Sand cast iron S&S as per IS - 1729	Each	243.00
25.38.2.2	Sand cast iron S&S as per IS- 3989	Each	268.00
25.39	**Providing and fixing plain bend of required degree.**		
25.39.1	**100 mm**		
25.39.1.1	Sand cast iron S&S as per IS - 1729	Each	258.00
25.39.1.2	Sand cast iron S&S as per IS - 3989	Each	275.00
25.39.2	**75 mm dia**		
25.39.2.1	Sand cast iron S&S as per IS - 1729	Each	204.00
25.39.2.2	Sand cast iron S&S as per IS- 3989	Each	208.00
25.40	**Providing and fixing heel rest sanitary bend**		
25.40.1	**100 mm**		
25.40.1.1	Sand cast iron S&S as per IS - 1729	Each	284.00
25.40.1.2	Sand cast iron S&S as per IS - 3989	Each	335.00
25.40.2	**75 mm dia**		
25.40.2.1	Sand cast iron S&S as per IS - 1729	Each	237.00
25.40.2.2	Sand cast iron S&S as per IS- 3989	Each	291.00
25.41	Providing and fixing double equal junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete :		
25.41.1	**100x100x100x100mm**		
25.41.1.1	Sand cast iron S&S as per IS - 1729	Each	601.00
25.41.1.2	Sand cast iron S&S as per IS - 3989	Each	704.00
25.41.2	**75x75x75x75 mm**		
25.41.2.1	Sand cast iron S&S as per IS - 1729	Each	478.00
25.41.2.2	Sand cast iron S&S as per IS - 3989	Each	570.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.42	Providing and fixing double equal plain junction of required degree.		
25.42.1	**100x100x100x100mm**		
25.42.1.1	Sand cast iron S&S as per IS - 1729	Each	554.00
25.42.1.2	Sand cast iron S&S as per IS - 3989	Each	655.00
25.42.2	**75x75x75x75 mm**		
25.42.2.1	Sand cast iron S&S as per IS - 1729	Each	416.00
25.42.2.2	Sand cast iron S&S as per IS - 3989	Each	524.00
25.43	Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.		
25.43.1	**100x100x100x100mm**		
25.43.1.1	Sand cast iron S&S as per IS - 1729	Each	437.00
25.43.1.2	Sand cast iron S&S as per IS - 3989	Each	573.00
25.43.2	**75x75x75x75 mm**		
25.43.2.1	Sand cast iron S&S as per IS - 1729	Each	329.00
25.43.2.2	Sand cast iron S&S as per IS - 3989	Each	425.00
25.44	Providing and fixing single equal plain junction of required degree :		
25.44.1	**100x100x100x100mm**		
25.44.1.1	Sand cast iron S&S as per IS - 1729	Each	379.00
25.44.1.2	Sand cast iron S&S as per IS - 3989	Each	518.00
25.44.2	**75x75x75x75 mm**		
25.44.2.1	Sand cast iron S&S as per IS - 1729	Each	292.00
25.44.2.2	Sand cast iron S&S as per IS - 3989	Each	389.00
25.45	Providing and fixing double unequal junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete :		
25.45.1	**100x100x75x75mm**		
25.45.1.1	Sand cast iron S&S as per IS - 1729	Each	651.00
25.45.1.2	Sand cast iron S&S as per IS - 3989	Each	988.00
25.46	Providing and fixing double unequal plain junction of required degree:		
25.46.1	**100x100x75x75mm**		
25.46.1.1	Sand cast iron S&S as per IS - 1729	Each	593.00
25.46.1.2	Sand cast iron S&S as per IS - 3989	Each	888.00
25.47	Providing and fixing single unequal junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete :		
25.47.1	**100x100x75mm**		
25.47.1.1	Sand cast iron S&S as per IS - 1729	Each	469.00
25.47.1.2	Sand cast iron S&S as per IS - 3989	Each	745.00
25.48	Providing and fixing single unequal plain junction of required degree :		
25.48.1	**100x100x75mm**		
25.48.1.1	Sand cast iron S&S as per IS - 1729	Each	409.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.48.1.2	Sand cast iron S&S as per IS - 3989	Each	646.00
25.49	Providing and fixing double equal plain invert branch of required degree:		
25.49.1	**100x100x100x100mm**		
25.49.1.1	Sand cast iron S&S as per IS - 1729	Each	592.00
25.49.1.2	Sand cast iron S&S as per IS - 3989	Each	582.00
25.49.2	**75x75x75x75 mm**		
25.49.2.1	Sand cast iron S&S as per IS - 1729	Each	442.00
25.49.2.2	Sand cast iron S&S as per IS - 3989	Each	469.00
25.50	Providing and fixing single equal plain invert branch of required degree:		
25.50.1	**100x100x100x100mm**		
25.50.1.1	Sand cast iron S&S as per IS - 1729	Each	454.00
25.50.1.2	Sand cast iron S&S as per IS - 3989	Each	460.00
25.50.2	**75x75x75x75 mm**		
25.50.2.1	Sand cast iron S&S as per IS - 1729	Each	340.00
25.50.2.2	Sand cast iron S&S as per IS - 3989	Each	350.00
25.51	Providing and fixing double unequal invert branch of required degree		
25.51.1	**100x100x75x75mm**		
25.51.1.1	Sand cast iron S&S as per IS - 1729	Each	629.00
25.51.1.2	Sand cast iron S&S as per IS - 3989	Each	776.00
25.52	Providing and fixing single unequal plain invert branch of required degree :		
25.52.1	**100x100x75mm**		
25.52.1.1	Sand cast iron S&S as per IS - 1729	Each	520.00
25.52.1.2	Sand cast iron S&S as per IS - 3989	Each	584.00
25.53	Providing and fixing sand cast iron S&S off sets as per IS: 1729		
25.53.1	**75 mm off sets**		
25.53.1.1	With 75 mm dia. pipe	Each	181.00
25.53.1.2	With 100 mm dia. pipe	Each	308.00
25.53.2	**114 mm off sets**		
25.53.2.1	With 75 mm dia. pipe	Each	312.00
25.53.2.2	With 100 mm dia. Pipe	Each	403.00
25.53.3	**152 mm off sets**		
25.53.3.1	With 75 mm dia. pipe	Each	390.00
25.53.3.2	With 100 mm dia. Pipe	Each	500.00
25.54	Providing and fixing sand cast iron S&S off sets as per IS: 3989.		
25.54.1	**75 mm off sets**		
25.54.1.1	With 75 mm dia. pipe	Each	253.00
25.54.2	**150 mm off sets**		
25.54.2.1	With 75 mm dia. pipe	Each	313.00
25.54.2.2	With 100 mm dia. Pipe	Each	429.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.55	Providing and fixing door piece, insertion rubber washer 3mm thick, bolts & nuts complete :		
25.55.1	**100mm**		
25.55.1.1	Sand cast iron S&S as per IS - 1729	Each	422.00
25.55.1.2	Sand cast iron S&S as per IS - 3989	Each	340.00
25.55.2	**75mm**		
25.55.2.1	Sand cast iron S&S as per IS - 1729	Each	303.00
25.55.2.2	Sand cast iron S&S as per IS - 3989	Each	259.00
25.56	Providing and fixing terminal guard:		
25.56.1	**100mm**		
25.56.1.1	Sand cast iron S&S as per IS - 1729	Each	215.00
25.56.1.2	Sand cast iron S&S as per IS - 3989	Each	220.00
25.56.2	**75mm**		
25.56.2.1	Sand cast iron S&S as per IS - 1729	Each	154.00
25.56.2.2	Sand cast iron S&S as per IS - 3989	Each	198.00
25.57	Providing and fixing collar:		
25.57.1	**100mm**		
25.57.1.1	Sand cast iron S&S as per IS - 1729	Each	163.00
25.57.1.2	Sand cast iron S&S as per IS - 3989	Each	228.00
25.57.2	**75mm**		
25.57.2.1	Sand cast iron S&S as per IS - 1729	Each	117.00
25.57.2.2	Sand cast iron S&S as per IS - 3989	Each	163.00
25.58	Providing lead caulked joints to sand cast iron/centrifugally cast (spun) iron pipes and fittings of diameter:		
25.58.1	100mm	Each	173.00
25.58.2	75mm	Each	148.00
25.58.3	50mm	Each	120.00
25.59	Providing and fixing M.S. stays and clamps for sand cast iron/centrifugally cast (spun) iron pipes of diameter :		
25.59.1	100mm	Each	54.00
25.59.2	75mm	Each	47.00
25.59.3	50mm	Each	38.00
25.60	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors :		
25.60.1	100 mm inlet and 100 mm outlet		
25.60.1.1	Sand cast iron S&S as per IS: 3989.	Each	637.00
25.60.1.2	Sand Cast Iron S&S as per IS: 1729.	Each	517.00
25.60.2	100 mm inlet and 75 mm outlet		
25.60.2.1	Sand cast iron S&S as per IS - 3989	Each	667.00
25.60.2.2	Sand Cast Iron S&S as per IS- 1729.	Each	443.00

S.No.	Particulars of Items	Unit	Rate in Rs
25.61	Cutting chases in brick masonry walls for following diameter sand cast iron/ centrifugally cast (spun) iron pipes and making good the same with cement concrete grade M-10 (Nominal Mix with 20mm maximum size of stone aggregate) including necessary plaster and pointing in cement mortar 1:4 (1 cement : 4 coarse sand) :		
25.61.1	100mm dia	meter	185.00
25.61.2	75mm dia	meter	132.00
25.61.3	50mm dia	meter	83.00
25.62	Painting C.I. cistern with bitumastic or any other anti-corrosive paint inside and white paint over a coat of zinc chromate yellow primer (of approved quality) on the outside surface of the cistern flush pipe, other fittings, etc. complete for new work.	Each	263.00
25.63	Re-painting C.I. cistern with bitumastic or any other anti-corrosive paint inside and white paint on the outside surface of the cistern, flush pipe, other fittings, etc. complete including polishing of wooden seat and lid and cleaning of W.C. pan with acid wherever necessary.	Each	176.00
25.64	Repainting C.I. cistern with synthetic enamel paint of pproved colour brand and manufacture on the outside surface of cistern flush pipe, other fittings etc. complete.	Each	77.00
25.65	Painting sand cast iron/ centrifugally cast (spun) iron soil, waste vent pipes and fittings with paint of any colour such as chocolate grey, or buff etc. over a coat of primer (of approved quality) for new work :		
25.65.1	100 mm diameter pipe	meter	23.00
25.65.2	75 mm diameter pipe	meter	18.00
25.66	Repainting sand cast iron/ centrifugally cast iron (spun) iron, soil, waste, vent pipes and fittings with paint of any colour such as chocolate, grey or buff etc :		
25.66.1	100 mm diameter pipe	meter	11.00
25.66.2	75 mm diameter pipe	meter	9.00
25.67	Repainting bath tub of size 1700x730x430mm with enamel paint.	Each	238.00
25.68	Providing and fixing vitreous china dual purpose closet suitable for use as squatting pan or European type water closet (Anglo Indian W.C pan) with seat lid with C.P. brass hinges and rubber buffers, 10 litre low level flushing cistern with fitting and brackets, 40mm flush bend 20mm over flow pipe with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required :		

S.No.	Particulars of Items	Unit	Rate in Rs
25.68.1	White vitreous china dual purpose WC pan with white solid plastic seat and lid with white vitreous china flushing cistern and C.P. flush bend.	Each	3377.00
25.69	Providing and fixing PTMT Waste Coupling for wash basin and sink, of approved quality and colour.		
25.69.1	Waste coupling 31mm of 79mm length and 62mm breadth weighing not less than 45gms.	Each	82.00
25.69.2	Waste coupling 38mm of 83mm length and 77mm breadth, weighing not less than 60gms.	Each	84.00
25.70	Providing and fixing PTMT Bottle Trap for Wash basin and sink.		
25.70.1	Bottle trap 31mm single piece moulded with height of 270mm, effective length of tail pipe 260mm from the centre of the waste coupling 77mm breadth with 25mm minimum water seal, weighing not less than 260gms.	Each	406.90
25.70.2	Bottle trap 38mm single piece moulded with height of 270mm, effective length of tail pipe 260mm from the centre of the waste coupling 77mm breadth with 25mm minimum water seal, weighing not less than 263gms.	Each	435.00
25.71	Providing and fixing PTMT liquid soap container 109mm wide, 125mm high and 112mm distance from wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour. weighing not less than 105 gms.	Each	182.00
25.72	Providing and fixing PTMT towel ring trapezoidal shape 215mm long, 200mm wide with a minimum distances of 37mm from wall face with concealed fittings arrangement of approved quality and colour. Weighing not less than 88 gms.	Each	164.00
25.73	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fitting arrangement of approved quality and colour.		
25.73.1	450MM long towel rail with total length of 495mm, 78mm wide and effective height of 88mm, weighing not less than 170gms.	Each	342.00
25.73.2	600mm long towel rail with total length of 645mm, width 78mm and effective height of 88mm, weighing not less than 190gms.	Each	376.00
25.74	Providing and fixing PTMT shelf 440 mm long, 124 mm width and 36 mm height of approved quality and colour. Weighing not less than 300 gms.	Each	422.00
25.75	Providing and fixing PTMT 15 mm Urinal spreader size 95x69x100 mm with 1/2" BSP thread and shapes. Weighing not less than 60 gms.	Each	168.00
25.76	Providing and fixing PTMT urinal cock of approved quality and colour.		

S.No.	Particulars of Items	Unit	Rate in Rs
25.76.1	15 mm nominal bore, 80mm long. 42 mm high and 30mm wide with BSP female threads weighing not less than 48 gms.	Each	127.00
25.77	Providing and fixing M.S. holder bat clamp of approved design to sand cast iron/ cast iron (spun) pipes comprising of M.S. flat brackets made of 50x5mm flat of specified shape, projecting 75mm outside the wall surface and fixed on wall with 4nos, 6mm dia expansion hold fasteners including drilling necessary holes in brick wall/ CC/ RCC surface and the cost of bolts etc. The pipes shall be fixed to the already fixed brackets with the help of 30mm x1.6mm galvanised M.S. flats of specified shape and of total length 420mm and shall be fixed with M.S. nuts, bolts, & washers of size 25x6mm, one bolts on each side of the pipe.		
25.77.1	Total bracket length 580mm of approved shape and design (for single 100mm dia pipe).	Each	166.00
25.77.2	Total bracket length 810mm of approved shape and design (for two 100mm dia pipes).	Each	202.00
25.77.3	Total bracket length 1040mm of approved shape and design (for three 100mm dia pipes).	Each	253.00