GOVERNMENT OF CHHATTISGARH

PUBLIC WORKS DEPARTMENT

Schedule of Rates for

BUILDING WORKS

2015

Newly Constructed Medical College Jagdalpur

With Effect from 1st January 2015

Issued by

ENGINEER-IN-CHIEF

PWD CHHATTISGARH , RAIPUR

Government of Chhattisgarh

Public Works Department

Schedule of Rates

for

Building Works

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w.e.f. 1st January 2015

Issued By

Engineer-in-Chief
Chhattisgarh PWD
Sirpur Bhawan
RAIPUR (C.G.)

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Ojasvi Software
106, Jamna Apartment
Sector-9, Rohini
Delhi-110085
Phone: 011 -27297960
ojasvisoftware@yahoo.com
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Schedule of rates for Building Works

Preamble

The **Schedule of rates** published by PWD is an important document, as this does not only serve as an useful tool for estimation, evaluation & execution of govt. works by P.W.D. people - but also referred to as an authority by other govt., semi government & private entities like builders, architects and consultants.

The last schedule of rates (SOR) for building works was published in 2009. Since then, the department has registered considerable changes in the prices of labour, materials, POL and machineries. Apart from it, the entire building community is witnessing a great change, as new ideas, items, concepts & technologies are coming up. All these have necessitated revision in the prevailing SOR.

it is a matter of great pleasure that this new **Schedule of rates for building works** is coming in to force from 01st January 2015.

Considerable efforts have been made to incorporate the above changes, but there always remain scope for betterment. Suggestions in this regard shall be highly welcomed.

Though every possible care has been taken in preparing this SOR but in a work like this, the chances of typographical and other errors can not be ruled out. It will be appreciated, if these could be brought to notice.

I sincerely express my gratitude and thanks to Shri D.K. Agrawal Chief Engineer PWD Raipur, who has taken immense pain in inspiring and guiding his entire team for making this document comprehensive and unique.

I would also commend S/Shri A.K. Chakraborti (Superintendent Engineer), P.K. Agrawal (Executive Engineer), P.K. Gupta (Assistant Engineer), Rajeev Nashine (Assistant Engineer), Hemant Arora (Assistant Engineer), C.K. Pandey (Assistant Engineer) & Pradeep Parvate (Sub Engineer) for their continuous untiring efforts in the above mission.

The help extended by M/s Ojasvi Software New Delhi in the preparation of this SOR is also appreciated.

The work has been made possible with the sincere efforts of several other persons & institutions. It is not possible here to name them all, but we sincerely acknowledge with thanks the help & cooperation extended by them.

This **SOR** is available on the department website (www.cg.nic.in/pwdraipur) also.

Raipur
27/12/2014

Er. D.K. Pradhan
E-in-C PWD, Chhattisgarh

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0.0 GENERAL NOTES

0.1 Reference mentioned herein shall be applicable to all sections to the extent the context permits and are intended to supplement the provisions in the particular section. In case of any discrepancy/ deviation, the provisions in the particular section shall take precedence.

0.2 The rates for all items of work, unless clearly specified otherwise, shall include cost of all labour, materials, machinery, testing charges, royalty, taxes, octroi and other inputs involved in the execution of the items.

0.3 This SOR is based on CPWD specifications. The execution of items of this SOR is to be done as per CPWD specifications amended up to date and as per all applicable BIS codes and standards.

0.4 INTERPRETATIONS

0.4.1 The Engineer-in-Chief, PWD Chhattisgarh shall be the sole deciding authority as to the meaning, interpretation and implications for various provisions of the specifications. His decision in writing shall be final.

0.4.2 Wherever any reference is made to any Indian Standard, it shall be taken as reference to the latest edition with all amendments issued thereto. In the event of any variation between the specifications mentioned before the each chapter and the Indian Standard, the CPWD specifications shall be followed.

0.5 DEFINITIONS

The following terms and expressions in the specification shall have the meaning or implication hereby assigned to them unless specified otherwise elsewhere.

0.5.1 **Contractor:** The Contractor shall mean the individual, or firm, or company, whether incorporated or not, undertaking the works and shall include the legal personal representatives of such individual or the persons composing such firm or company, or the successors of such individual or firm or company and the permitted assignees of such individual, or firm, or company.

0.5.2 **Engineer-in-Charge:** The 'Engineer-in-Charge' means the Engineer Officer, who shall supervise and be in charge of the work and who shall sign the contract on behalf of the Governor of Chhattisgarh.

0.5.3 **Site:** The 'site' shall mean the land/ or other places, on, into or through which the work is to be executed under the contract or any adjacent land, path or street through which the work is to be executed under the contract, or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.

0.5.4 **Store:** The 'store' shall mean the place of issue of materials included in the appropriate schedule of a contract for issue by the PWD. In all other cases 'Store' shall mean any PWD store in the district.

0.5.5 **IS:** The standard, specification and Code of Practices issued by the Bureau of Indian Standards.

0.5.6 **Best:** The word 'best' when used shall mean that in the opinion of the Engineer-in-Charge, there is no superior material/ article and workmanship obtainable in the market and trade respectively. As far as possible the standard required shall be specified in preference to the word 'Best'.

0.5.7 **Department:** 'Department' shall mean Public Works Department or PWD.

0.6 FLOOR AND LEVELS

0.6.1 Building:

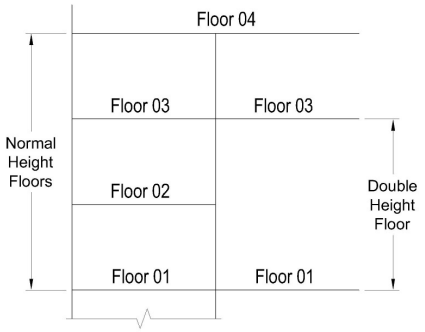
0.6.1.1 **Floor 1** is the lowest floor above the ground level in the building unless otherwise specified in a particular case. The floors above floor 1 shall be numbered in sequence as floor 2, floor 3 and so on. The number shall increase upwards.

0.6.1.2 **Floor level:** For floor1, top level of finished floor shall be the floor level and for all other floors above floor 1. Top level of the structural slabs shall be the floor level.

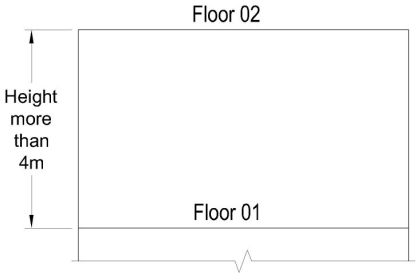
0.6.1.3 **Plinth level:** Floor 1 level or 1.2 m above the ground level whichever is lower shall be the plinth level.

0.6.1.4 **If two floor levels meet at any level with reference to different parts of a building, such as in case of double height slab, then the floor level and floor no.** of this slab shall refer to the part of the building where normal height floors exists e.g. slab top level of conference hall (or, porch) at ground floor is at second floor level of adjacent part of the building, then floor no. of slab top level of conference hall shall be numbered as floor 3 level (not as floor 2 level, as it appears, treating the hall as individual and numbering ground floor as floor 1 and next slab as floor 2) (Fig 1).

But in case of individual building with excessive height slab, such as auditorium, the slab shall be numbered on normal numbering system that is floor 2 level (Fig 2).



(Fig. 1)



(Fig. 2)

0.6.1.5 Floor no of mazenine floors would refer to the part of the building, where they exist.

0.6.2 Special Structures:

0.6.2.1 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 1.2 m above the ground level shall be the floor 1 level as well as plinth level. Level at a height of 4m above floor 1 level will be reckoned as floor 2 level and level at a height of 4 m 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 4 metre, 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 4 metres

0.7 FOUNDATION AND PLINTH

The work in foundation and plinth shall include:

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

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

(c) **For reservoirs/ tanks (other than overhead reservoirs/ tanks):** All works upto 1.2 metre above the ground level.

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

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

0.8 MEASUREMENTS

0.8.1 In booking dimensions, the order shall be consistent and in the sequence of length, width and height or depth or thickness.

0.8.2 **Rounding off:** Rounding off, where required shall be done in accordance with IS: 2-1960. The number of significant places rounded in the rounded off value should be as specified.

0.9 MATERIALS

0.9.1 Samples of all materials to be used on the work shall be got approved by the contractor from the Engineer-in-Charge well in time. The approved samples duly authenticated and sealed shall be kept in the custody of the Engineer-in-Charge till the completion of the work. All materials to be provided by the contractor shall be brand new and as per the samples approved by the Engineer-in-Charge

0.9.2 Mandatory tests are required to be carried out as per relevant IS: code. Testing of samples shall be done in the laboratory approved by the Engineer-in-Charge.

0.9.3 The materials, supplied by the Department shall be deemed to comply with the specifications.

0.9.4 Materials stored at site, depending upon the individual characteristics, shall be protected from atmospheric effects due to rain, sun, wind and moisture to avoid deterioration.

0.9.5 All material brought at the site shall be tested, before being used in the work.

0.9.6 Materials like timber, paints etc. shall be stored in such a way that there may not be any possibility of fire hazards. Inflammable materials and explosives shall be stored in accordance with the relevant rules and regulations or as approved by Engineer-in-Charge in writing, so as to ensure desired safety during storage.

0.9.7 The unit weight of materials unless otherwise specified shall be as given in IS: 1911-1967.

0.10 WAGES TO LABOUR:

The contractor shall be bound to pay the wages to the labours, as per the minimum wages act, rules and other instructions issued by State Govt. from time to time.

0.11 SAFETY IN CONSTRUCTION

0.11.1 The contractor shall employ only such methods of construction tools and plant, as are appropriate for the type of work, or as approved by Engineer-in-Charge. If the contractor fails to comply the orders of Engineer-in-Charge/ department with respect to safety measures and any untoward incident happens, contractor will be solely responsible.

The contractor shall take all precautions and measures to ensure safety of works and workman and shall be fully responsible for the same. Safety pertaining to construction works such as excavation, centring and shuttering, trenching, blasting, demolition, scaffolds, ladders working platforms, gangway, mixing of bituminous materials, electric and gas welding use of hoisting and construction machinery shall be governed by PWD specifications, CPWD specifications, relevant safety codes and the direction of Engineer-in-Charge

0.12 NON SCHEDULE ITEMS

0.12.1 Items not included in this SOR shall neither be provided in any estimate. nor be executed without written prior permission of the Superintending Engineer, even though they are shown in the drawings. If any new item is required to be executed in any work, proposal with full justification along with financial implications of the same must be submitted to the Superintending Engineer for obtaining written prior approval.

0.13 BASIC RATES OF STEEL AND CEMENT

For preparation of SOR, “Base Rates” of Steel and Cement have been taken as given below -

(A)	STEEL	
	(I) Reinforcing Steel - Average Base Rate for all sections.	
	(i) Cold twisted/ Hot rolled deformed bars	Rs. 40.90 per kg.
	(ii) Thermo-Mechanically Treated bars	
	FE 415 -	Rs. 41.50 per kg.
	FE 500D -	Rs. 41.75 per kg.
	FE 550D -	Rs. 42.20 per kg.
	(II) Structural Steel & Steel Sheets	
	Average Base Rate for all sections -	Rs. 43.00 per kg.
(B)	CEMENT -	Rs. 5100.00 per MT.

1.0 EARTH WORK

A) DEFINITIONS

a) Deadmen or Tell Tales: Mounds of earth left undisturbed in pits dug out for borrowing earth

b) Burjis: Short pillars of brick/ stone having top surface finished with cement plaster for marking etc.

c) Formation or Profile: Final shape of the ground after excavation or filling up.

d) Foul position: Filthy and unhygienic conditions where physical movements are hampered such as soil mixed with sewage or night soil.

e) Lead: The distance for removal, measured over the shortest practicable route and not necessarily the route actually taken.

f) Liquid mud: Mud in liquid form or in a highly plastic state.

g) Lift: The vertical distance for removal with reference to the ground level. The excavation up to 1.5 metres depth below the ground level and depositing the excavated materials upto 1.5 metres above the ground level are included in the rate of earth work. Lifts inherent in the lead due to ground slope shall not be paid for.

h) Safety rules: Safety rules as laid down by the statutory authority and as provided in National Building Code (NBC) shall be followed.

B) CLASSIFICATION OF SOILS/ EXCAVATED MATERIALS

(a) The earthwork shall be classified under the following categories and measured separately for each category:

(i) All kind of soils: Generally any strata, such as sand, gravel, loam, clay, mud, black cotton, moorum, shingle, river or nallah bed boulders 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. Shovels, jumper, scarifiers, ripper and other manual digging implements.

(ii) 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 varieties of lime stone, sand stone, hard laterite, hard conglomerate and un-reinforced cement concrete below ground level, and also any rock which in dry state may be hard requiring blasting but which, when wet, becomes soft and manageable by means other than blasting.
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'.

(iii) Hard rock: Generally any rock or boulder for the excavation of which blasting is required such as quartzite, granite, basalt, reinforced cement concrete (reinforcement to be cut through but not separated from concrete) below ground level and the like.

(iv) Hard Rock (blasting prohibited): Hard rock requiring blasting as described under (c) but where the blasting is prohibited for any reason and excavation has to be carried out by chiseling, wedging or any other agreed method.

(b) **Authority for classification:** The classification of excavation shall be decided by the Engineer-in-Charge and his decision shall be final and binding on the Contractor. Merely the use of explosives in excavation will not be considered as a reason for higher classification unless blasting is clearly necessary in the opinion of the Engineer-in-Charge.

(c) **Execution**

(i) All excavation operations shall include excavation and 'getting out' the excavated materials. 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. Only the excavation shown on the drawings shall be measured and recorded for payment. Extra excavation beyond the dimensions shown in the drawing, shall not be measured for payment, nor the filling/ backfilling resulting from such excavation shall be payable. 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 same material or good earth as decided by the Engineer-in-Charge.

(ii) Excavation can be done by mechanical or manual means as per choice/ ease of contractor and conditions of site.

(iii) In firm soils, the sides of the trenches shall be kept vertical upto a depth of 2 metres from the bottom. For greater depths, the excavation profiles shall be widened by allowing steps of 50 cms on either side after every 2 metres from the bottom. Alternatively, the excavation can be done so as to give slope of 1:4 (1 horizontal : 4 vertical). Where the soil is soft, loose or slushy, the width of steps shall be suitably increased or sides sloped or the soil shored up as directed by the Engineer-in-Charge**.**

(iv) In case of excavation for foundation in trenches or over areas, the bed of excavation shall be to the correct level or slope and consolidated by watering and ramming. If the excavation for foundation is done to a depth greater than that shown in the drawings or as required by the Engineer-in-Charge, the excess depth shall be made good by the contractor at his own cost with the concrete of the mix used for leveling/ bed concrete for foundations. Soft/defective spots at the bed of the foundations shall be dug out and filled with concrete (to be paid separately) as directed by the Engineer-in-Charge.

(v) The water that may accumulate in excavations during the progress of the work from springs, Tidal 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.

(vi) Excavation where directed by the Engineer-in-Charge shall be securely fenced and provided with proper caution signs, conspicuously displayed during the day and properly illuminated with red lights during the night to avoid accidents.

(vii) In case of Archaeological monuments within or adjacent to the area, the contractor shall provide necessary fencing all-round such monuments as per the directions of the Engineer-in-Charge and protect the same properly during execution of work. Payment for providing fencing shall be made separately.

(d) Blasting Operation

(i) 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, regulation, rules etc. pertaining to the acquisition, transport, storage, handling and use of explosives shall be strictly followed.

(ii) 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, dimension and notes

(iii) The magazine for storage of explosives shall be limited to the designs and specification of the explosive department concerned and located at the approved site.

(iv) Materials, tools, plants, equipments and personnel, deputed on blasting operation, should be approved by Engineer-in-Charge.

(e) Antiquities and Useful Materials

(i) Any finds of archaeological interest such as ancient carvings, relics of antiquity, coins, fossils or other articles of value curiosities which may be discovered or excavated, shall be the property of the Government and are to be delivered to the Engineer-in-Charge

(ii) 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.

(iii) Hard rock obtained during excavation shall be issued to the contractor @ Rs 200.00 per cum and amount shall be recovered from the concurrent bill.

(f) Filling

(i) The earth used for filling shall be free from all roots, grass, shrubs, rank vegetation, brushwood, tress, sapling and rubbish. Black cotton soil shall not be used for filling/ back filling.

(ii) The space around the foundations and drains in trenches shall be cleared of all debris, brick bats etc. The filling shall be done in layers not exceeding 20 cm in depth. Each layer shall be watered, rammed and consolidated. Ramming shall be done with iron rammers where possible and with blunt end of crow bars where rammers cannot be used. Special care shall be taken to ensure that no damage is caused to the pipes, drains, masonry or concrete in the trenches. In case of filling under floor, the finished level of filling shall be kept to the slope intended to be given to the floor.

(g) Protections

(i) Excavation where directed by the Engineer-in-Charge shall be securely barricaded and provided with proper caution signs, conspicuously displayed during the day and properly illuminated with red lights and/or written using fluorescent reflective paint as directed by Engineer-in-Charge during the night to avoid accident.

(ii) The Contractor shall take adequate protective measures to see that the excavation operations do not damage the adjoining structures or dislocate the services.

Water supply pipes, sluice valve chambers, sewerage pipes, manholes, drainage pipes and chambers, communication cables, power supply cables etc. met within the course of excavation shall be properly supported and adequately protected, so that these services remain functional. However, if any service is damaged during excavation shall be restored in reasonable time.

(iii) Any damages done by the contractor to any existing work shall be made good by him at his own cost.

C) MEASUREMENTS

(a) Measurement shall be done for excavation and filling as per dimensions shown in the drawings or as per modified dimensions or as per direction by the Engineer-in-charge. 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 measuring with steel tape or by recording levels before the start of the work and after the completion of the work, as decided by Engineer-in-Charge.

(b) The calculated quantity of volume will be in cum and of area in square metre correct upto two places of decimals.

(c) Pumping out of water during excavation shall be measured in cum and shall be payable one time for the entire operation of excavation. Height for calculating volume shall be based on the difference of water level and the bottom level of the excavated pit.

(d) Typical section of excavation pit showing type of the soil at different levels, such as black cotton soil, yellow soil, sandy soil, hard moorum etc. shall be recorded in measurement books. If different pits have different soil pattern, then it shall be mentioned individually and clearly in the measurement book.

D) RATES:

Rates of all items in this chapter are inclusive of the expenses of all labour, materials, hire & running expenses of all tools & machineries and all incidental and other charges required to complete the item of work in full.

E) ANTI-TERMITE TREATMENT

(i) **Chemicals**: Any one of the following chemicals in water emulsion to achieve the percentage concentration specified against each chemical shall be used:

(a) Chlorpyrifos emulsifiable concentrate of 20%

(b) Lindane emulsifiable concentrate of 20%

Anti-termite treatment chemical is available in concentrated form in the market and concentration is indicated on the sealed containers. To achieve the specified percentage of concentration, Chemical should be diluted with water in required quantity before it is used. Graduated containers shall be used for dilution of chemical with water in the required proportion to achieve the desired percentage of concentration. For example, to dilute chemical of 20% concentration. 19 parts of water shall be added to one part of chemical for achieving 1% concentration.

The contractor shall hand over the chemical of required concentration in sealed original containers to the Engineer-in-Charge or his representative. Chemical shall be kept in the custody of the Engineer-in-Charge or his authorized representatives and issued for use to meet the day's requirements. Empty containers after washing and concentrated chemical left unused at the end of the day's work shall be returned to the Engineer-in-Charge or his authorized representative.

(ii) **Treatment process** : Detailed process to be followed as per CPWD specifications

(iii) **Measurements**: Separate measurement for supply of chemical required for anti-termite treatment and the work executed under treatment process shall be made.

Measurement of supply of chemical: measurement shall be made in litres of 20% concentrate chemical emulsion.

Measurement for treatment: All dimensions shall be measured correct to a cm. The measurements shall be made of the surface actually provided with anti termite treatment. Measurements shall be done separately for treatment of foundations, soils under floors, voids in masonry and wood work as detailed below:

(a) Treatment along outside of foundations : The measurements shall be made in running metres taking length along the plinth of the building.

(b) Treatment of soil under floors : The measurements shall be made in square metres, inside clear dimensions of rooms, verandah etc. shall be taken.

(c) Treatment of voids in masonry : The measurements shall be made in running metres along the plinth of the building.

(d) Treatment of wood work : The measurements shall be made in running metres for chowkhats, joints, purlins, beams etc.

(iv) **Rates**: The rate of supply of chemical include the rate of material including handling and storage charges. The rate of treatment shall include the cost of labour and all other inputs, (except concentrated chemical) involved in all the operations required for treatment including drilling, refilling and making good the holes as directed by Engineer-in-Charge.

1.0 EARTH WORK

Code No	Description	Unit	Rate Rs.
1.1	Excavation for all types and sizes of foundations, trenches and drains or for any other purpose including disposal of excavated stuff upto 1.5 m lift and lead upto 50m (at least 5m away from the excavated area), including dressing and leveling of pits.		
1.1.1	In all types of soils.	cum	185.00
1.1.2	In ordinary rocks.	cum	267.00
1.1.3	In hard rocks requiring blasting.	cum	453.00
1.1.4	In hard rocks where blasting in prohibited.	cum	798.00
1.2	Surface dressing of the ground including removing vegetation and making up undulations and in-equalities not exceeding 15 cms in depth/ height including disposal of rubbish upto 1.5 m lift and lead upto 50m (at least 5m away from the dressed area).	sqm	7.20

Code No	Description	Unit	Rate Rs.
1.3	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 after cutting in approved sizes and disposal of unserviceable material.		
1.3.1	Beyond 30 cm girth upto and including 60 cm girth	each	132.00
1.3.2	Beyond 60 cm girth upto and including 120 cm girth	each	582.00
1.3.3	Beyond 120 cm girth upto and including 240 cm girth	each	2721.00
1.3.4	Above 240 cm girth	each	5486.00
1.4	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of 1 m above ground level and removal of rubbish upto a distance of 50 m outside the periphery of the area cleared.	sqm	3.70
1.5	Clearing grass and removal of the rubbish upto a distance of 50 m outside the periphery of the area cleared.	sqm	1.90
1.6	Extra for every additional lift of 1.5 m or part thereof.		
1.6.1	All types of soils	cum	26.50
1.6.2	Ordinary or hard rocks	cum	47.50
1.7	Extra rate for quantity of work executed in or under water and/ or liquid mud including pumping out water.	cum	51.00
1.8	Extra rate for quantity of work executed in or under foul condition.	cum	44.00
1.9	Extra rate for lead for every 50m lead or part thereof and upto 150 m beyond 50 m free lead and 1.5 m free lift by manual means only.		
1.9.1	For Soils	cum	33.00
1.9.2	For Rocks.	cum	49.50
1.10	Pumping out water caused by springs tidal or river seepage, broken water main or drains and like during Excavation or during Excavation and laying of base concrete (volume to be calculated taking height from water level to bottom of pit and to be measured and paid) .	cum	146.00
1.11	Open timbering in foundation trenches including strutting and shoring complete (measurements to be taken of the face area timbered.)		
1.11.1	Depth not exceeding 1.5 M.	sqm	178.00
1.11.2	Depth exceeding 1.5 M. but not exceeding 3 M.	sqm	181.00
1.11.3	Depth exceeding 3.0 M.	sqm	185.00
1.12	Open timbering in case of shaft, wells cesspit, manholes and like, including strutting, shoring etc. complete (measurements to be taken of face are timbered)		
1.12.1	Depth not exceeding 1.5 M.	sqm	148.00
1.12.2	Depth exceeding 1.5 M. but not exceeding 3 M.	sqm	154.00
1.12.3	Depth exceeding 3.0 M	sqm	179.00

Code No	Description	Unit	Rate Rs.
1.13	Extra for planking and strutting in open timbering if required to be left permanently in position (Face to face area of the timber permanently left to be measured).	sqm	1292.00
1.14	Close timbering in foundation trenches including strutting, shoring and packing cavities where ever required complete (Measurement to be taken of the face area timbered).		
1.14.1	Depth not exceeding 1.5 M.	sqm	348.00
1.14.2	Depth exceeding 1.5 M. but not exceeding 3 M.	sqm	352.00
1.14.3	Depth exceeding 3.0 M.	sqm	355.00
1.15	Close timbering in case of shaft, walls, cesspit, manholes and like including strutting shoring and packing cavities (wherever required complete measurement to be taken of the face area timbered).		
1.15.1	Depth not exceeding 1.5 M.	sqm	367.00
1.15.2	Depth exceeding 1.5 M. but not exceeding 3 M.	sqm	392.00
1.15.3	Depth exceeding 3.0 M.	sqm	418.00
1.16	Extra for planking, strutting and packing materials for cavities in close timbering if required to be left permanently in position (face area of the timber permanently left, to be measured).	sqm	2521.00
1.17	Filling from available excavated stuff (Excluding rock) in trenches, plinth, sides of foundation etc. in layers not exceeding 20cm in depth consolidating each deposited layer by ramming and watering with a lead upto 50 M. and lift upto 1.5 M.	cum	65.00
1.18	Providing and filling in plinth with sand/ Crusher dust and hard moorum under floor in layers not exceeding 20cm in depth consolidating each deposited layer by ramming and watering, including dressing etc. complete.	cum	371.00
1.19	Providing filling and compacting local earth (from approved source pit) in layers not exceeding 20cm in depth consolidating each deposited layer by ramming and watering, including dressing etc. complete.	cum	242.00
1.20	Excavating holes upto 0.25 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.		
1.20.1	All kinds of soil.	each	44.00
1.20.2	Ordinary rock	each	110.00
1.20.3	Hard rock (requiring blasting)	each	219.00
1.20.4	Hard rock (blasting prohibited)	each	293.00
1.21	Deduct for the serviceable excavated stone received from the excavation of hard rock which is the property of contractor.	cum	203.00

Code No	Description	Unit	Rate Rs.
1.22	Supplying chlorpyrifos/ Lindane emulsifiable concentrate of 20% in sealed containers including delivery as specified.	litre	208.00
1.23	Diluting chemical emulsion (chlorpyrifos/ lindane) in water as per manufacturers recommendation and injecting for post - constructional ani-termite treatment (excluding cost of chemical emulsion):		
1.23.1	Along external wall where the apron is not provided using diluted chemical emulsion @ 7.5 litres / sqm of the vertical surface of the substructure to a depth of 300 mm including excavation channel along the wall & rodding etc. complete:	metre	9.10
1.23.2	Along external wall below concrete or masonry apron along the plinth wall using diluted chemical emulsion @ 0.65 litres per hole including drilling 12mmdia holes 300mm apart and plugging the same with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing apron after injecting chemical emulsion.	metre	15.00
1.23.3	Treatment of masonry wall/ soil under existing floors using diluted chemical emulsion @ one litre per hole, including drilling 12 mm diameter holes at the junction of floor and walls along the cracks on the floor at the interval of 300 mm and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor :	metre	10.50
1.24	Diluting chemical emulsion (chlorpyrifos/ lindane) in oil or kerosene based solution as per manufacturers recommendation and injecting the diluted chemical emulsion for post - constructional anti-termite treatment of wood work at points of contact @ 0.5 litres per hole by drilling 6 mm dia holes at downward angle of 45 degree at 150 mm centre to centre and sealing the same.	metre	118.00
1.25	Diluting chemical emulsion (chlorpyrifos/ lindane) in water as per manufacturers recommendation and injecting for pre-constructional curative cum preventive anti-termite treatment:(Five year service guarantee bond to be signed by contractor)		
1.25.1	Surface treatment by spreading emulsion under floor, over the plinth area before laying base concrete @ 5 litres / sqm	sqm	27.50
1.25.2	Treatment of inside of plinth masonry wall on using diluted chemical emulsion @ 1.5 litre per hole, including drilling 12 mm diameter holes in plinth wall below plinth protection at the interval of 300 mm and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand).	metre	19.00
1.25.3	Treatment of outer side of plinth masonry wall using diluted chemical emulsion @ 1.5 litre per hole, including drilling 12 mm diameter holes in plinth wall at the junction of floor at the interval of 300 mm and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand).	metre	13.50
1.26	Carriage by mechanical transport upto 5 km lead:		
1.26.1	Earth	cum	111.00
1.26.2	Sludge	cum	89.00
1.26.3	Dismantled Building debris (Mulba)	cum	91.50

Code No	Description	Unit	Rate Rs.
1.27	Extra for mechanical transport for every one km or part thereof beyond first 5 km lead.		
1.27.1	Earth	cum.km	9.00
1.27.2	Sludge	cum.km	7.20
1.27.3	Dismantled Building debris (Mulba)	cum.km	9.00

2.0 FORM WORK

A) SCOPE

Formwork shall include all temporary or permanent forms or moulds required for forming the concrete of the shape, dimensions and surface finish as shown on the drawings together with all props, staging, centring, scaffolding and temporary construction required for their support for height of staging upto 4.0 metre.

B) MATERIAL USED IN FORM WORK

i) Form shall be constructed with metal. However, the form work with water proof top surface can also be used with prior approval of Engineer-in-Charge. The forms shall be of such thickness that the forms remain true to shape till the period of serviceability. All bolts should be counter sunk.

ii) All materials (For which BIS specifications/ Standards are available) shall conform to the specifications issued by the Bureau of Indian Standards. All other material shall be of good quality and sufficient strength that the forms remain true to shape.

iii) Materials and components used for formwork shall be examined before use/ reuse for damage or excessive deterioration and shall be used, only if found suitable after necessary repairs. The materials used should not leave any stain on the concrete and so fixed to its backing as not to impart any blemishes.

iv) Form work shall be properly designed for self weight, weight of reinforcement, weight of fresh concrete, and in addition, the various live loads likely to be imposed during the construction process (such as workmen, materials and equipment).

v) The formwork shall be robust and strong and joints shall be leak proof. 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.

C) DESIGN OF FORM WORK:

The contractor shall furnish the design and drawings of complete form work (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. Form work shall be designed and constructed to the shapes, lines and dimensions shown on the drawings with the tolerances given below:

S No	Location	Tolerance
1	Deviation from specified dimension of cross section of columns and beams	+ 12mm
2	Deviation from specified dimension of footings. a) Dimension in plan b) Eccentricity in plan c) Thickness	 + 50mm 0.02 times the width of the footing in the direction of deviation but not more than 50mm +0.05 times the specified thickness
NOTE: Tolerances apply to concrete dimension only and not to positioning of steel or dowels.		

D) REMOVAL OF FORM WORK (STRIPPING TIME)

In normal circumstances and where ordinary Portland cement is used, form work may generally be removed after the expiry of the following periods:

S No	Location	Tolerance
a)	Walls, columns and vertical faces of all structural members	24 to 48 hours as may be decided by the Engineer-in-Charge
b)	Props to Slab i) Spanning upto 4.50 M ii) Spanning over 4.50 M	 7 days 14 days
c)	Props to Beams and arches i) Spanning upto 6 M ii) Spanning over 6 M	 14 days 21 days

Note-

i) For other types of cement, the stripping time recommended for ordinary Portland cement may be suitably modified. If Portland slag or low heat cement has been used for concrete, the stripping time will be 10/7 of the period stated above.

ii) The number of props left under, their sizes and disposition shall be such as to be able to safely carry the full dead load of the slabs, beam or arch as the case may be together with any live load likely to occur during curing or further construction.

iii) For rapid hardening cement, 3/7 of above periods will be sufficient in all cases except for vertical side of slabs, beams and columns which should be retained for at least 24 hours.

iv) In case of cantilever slabs and beams, the centring shall remain till structures for counter acting or bearing down have been erected and have attained sufficient strength.

v) Proper precautions should be taken to allow for the decrease in the rate of hardening that occurs with all types of cement in cold weather and accordingly stripping time shall be increased.

vi) Work damaged through premature or careless removal of form work shall be reconstructed within 24 hours and cost will borne by the contractor.

E) SURFACE TREATMENT

Shuttering surfaces should be coated with suitable mould oil, which acts both as a parting agent and also give surface protections to shuttering.

After 3-4 uses and also in cases when shuttering has been stored for a long time, it should be recoated with mould oil before the next use.

A typical mould oil is heavy mineral oil or purified cylinder oil containing not less than 5% pentachlorophenol conforming to IS 716- 1987 well mixed to a viscosity of 70-80 centipoises.

Lubricating (machine oils) are prohibited for use as a coating.

F) MEASUREMENT:

Measurements shall be taken of the area of shuttering in contact with the concrete surface. No deductions from the shuttering due to openings/ obstruction shall be made if the area of such openings/ obstructions does not exceed 0.4 sqm. Nothing extra shall be paid for forming such openings

Dimensions in form work shall be measured in metre upto two place of decimal (cm). The area should be calculated in square metre correct to two decimal places.

Where height of staging for form work is more than 4.0 metre in one floor, extra payment for additional height shall be made as detailed in relevant item.

G) RATES:

Rates in this chapter are for the finished work including preparation of drawing & design, the cost of all materials, labour, tools and plants required for construction and removal of form work at all levels 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 rates also include coating of form work with an approved release agent that will effectively prevent sticking and will not stain the concrete surface. Rates also include all leads and lifts of all materials etc. required for the work.

Where height of staging at any floor is more than 4.0 metre, extra rate for additional height of staging shall be paid in shuttering as detailed in relevant item.

2.0 FORM WORK

Code No	Description	Unit	Rate Rs.
2.1	Providing and fixing form work including centring, shuttering, strutting, staging, propping bracing etc. complete and including its removal at all levels, for:		
2.1.1	Foundations, footings, bases of columns plinth beam, curtain wall in any shape and size and all type of wall below plinth level.	sqm	139.00
2.1.2	Wall of any thickness including attached pilasters, buttresses etc. in super structure.	sqm	228.00
2.1.3	Window sills, anchor blocks, string course, bends, copings, bed plates and like.	sqm	184.00
2.1.4	Edge of slab, breaks in floor and walls upto 200mm.	metre	34.00
2.1.5	Columns, Pillars, Piers and likes- rectangular or square in shape	sqm	297.00
2.1.6	Columns, beams & walls- circular or any other geometrical shape other than square and rectangular in all sizes	sqm	356.00
2.1.7	Suspended floors, roofs, access platform, balconies (plain surfaces) and shelves (cast in situ)	sqm	235.00
2.1.8	Beams, lintels, cantilevers & walls	sqm	202.00

Code No	Description	Unit	Rate Rs.
2.1.9	Vertical and horizontal fins individually or forming box, louvers bands, almirah shelves and likes.	sqm	336.00
2.1.10	Folded plates slabs	sqm	194.00
2.1.11	Arches, domes and likes, upto 6 M. Span.	sqm	584.00
2.1.12	Arches, domes and likes, exceeding 6 M. span	sqm	890.00
2.1.13	Weather shade, chhajja, Cornices and mouldings	sqm	294.00
2.1.14	Spiral / folded plate type stair cases including risers and landings	sqm	307.00
2.1.15	Stair cases of all types excluding spiral and folded plate type, including risers and landings	sqm	230.00
2.1.16	Coffer/ waffle/ Grid slab of any size or shape.		
	Note: (1) Any grid box of area less than 1 sqm will only be paid in this item. (2) Only plan area is to be measured and paid and grid beams or fins will not be paid separately.	sqm	510.00
2.2	Extra for additional height every 1m or part thereof where height of staging for form work exceeds 4.0 metre with adequate bracing, propping etc at all levels, for suspended floor, roof, landing, beam and balcony. (only plan area is to be measured):	sqm	40.50
2.3	Extra for providing fixing and removing of propping from lower floor upwards for the concreting. Propping should be provided two floors below. The props of lower floor must be 50% of the props of the floor above including wedging etc. complete. In case propping is done in one floor below, only half the rate shall be paid.	sqm	17.00
2.4	Extra for unsupported individual columns with height more than 4.0 m from the immediate lower level in every floor.		
	(full area of column is to be paid)	sqm	29.50

3.0 CEMENT CONCRETE (PLAIN AND REINFORCED)

A) MATERIALS

1. Cement

Cement to be used in the works shall be any of the following types with the prior approval of the Engineer-in-Charge:

a) Ordinary Portland cement, 43 Grade conforming to IS: 8112.
b) Ordinary Portland cement, 53 Grade conforming to IS: 12269.
c) Sulphate resistant Portland cement conforming to IS: 12330.
d) Portland slag cement conforming to IS: 455.
e) Rapid Hardening cement conforming to IS: 8041

Different types of cement shall not be mixed together. In case more than one type of cement is used in any work, a record shall be kept showing the location and the types of cement used.

2. Steel:

Steel to be used shall conform to the following:

(A) Mild steel and medium tensile bars confirming to IS: 432 : (Part I-1982).
(B) Hard drawn steel wire conforming to IS: 432:Part-II-1982
(C) High strength deformed steel bars confirming to IS:1786 : 2008
(D) Hard drawn steel wire fabric confirming to IS: 1566:1982
(E) TMT bars confirming to IS : 1786 : 2008

All steel shall be procured from original producers like SAIL, RINL, TISCO and JSPL or equivalent . No re-rolled steel shall be used in the work. TMT steel should be verified on elongation basis as per IS: 1786 of 2008

Only new steel shall be delivered to the site. Every bar shall be inspected before assembling on the work and defective, brittle or burnt bar shall be discarded. Cracked ends of bars shall be discarded.

Steel for reinforcement shall be stored in such a way as to prevent distorting and corrosion at sites. (Bars of different types, sizes and lengths to be stacked separately)

3. Coarse Aggregates:

Coarse 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 materials. All coarse aggregate shall conform to IS: 383:1970 and tests for conformity shall be carried out as per IS: 2386:1963 I to VIII.

The maximum value of flakiness Index for coarse aggregate shall not exceed 35 percent. The coarse aggregate shall satisfy the following requirements of grading, according to the nominal size of aggregate:

Grading Requirements of Coarse Aggregate

IS Sieve Designation	Percent passing (by weight) for nominal size of			
	40mm	**20mm**	**16mm**	12.5 mm
75 mm	100	-	-	-
37.5 mm	95 to 100	100	-	-
19 mm	30 to 70	95 to 100	100	100
16 mm	-	-	90 to 100	-
11.2 mm	-	-	-	90 to 100
9.5 mm	10-35	25 to 55	30 to 70	40 to 85
4.75 mm	0 to 5	0 to 10	0 to 10	0 to 10
2.36 mm	-	-	-	-

4. Sand/ Fine Aggregates

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. The fine aggregate should satisfy the following grading requirement.

Table

IS Sieve	Percentage passing for			
	Grading Zone I	**Grading Zone II**	**Grading Zone III**	**Grading Zone IV**
9.50 mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	92-100
2.36 mm	60-95	75-100	85-100	95-100
1.18 mm	30-70	55-90	75-90	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15

5. 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.

6. Concrete:

Design mix Concrete, mixed in a batching and mixing plant shall generally be used. Ready Mix concrete manufactured by reputed/ approved manufacture may also be used, if allowed by the Engineer-in-Charge.

Concrete with nominal mix, mixed in mechanical concrete mixer may be permitted by Engineer-in-charge in case of small quantity of concrete and in remote locations. Hand mixing is strictly 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 coarse aggregate shows complete coating of mortar, containing its proportionate amount of cement. In no case, mixing shall be done for less than 2 minutes.

In case where design mix concrete is not available/ possible the concrete shall be mixed in concrete mixer in volumetric ratio as specified in item. The minimum compressive strength on work tests for different concrete mixes shall be as specified for various grades prepared by volume basis, in Table below:

TABLE

Concrete mix on	Min compressive strength 15cm cube in kg/cm^2	
	7 days	28 days
1:1$^1/_2$:3	175	265
1:2:4	140	210

FREQUENCY OF SAMPLING FOR CUBE TEST

Quantity of concrete Delivered (cum)	Number of samples
Less than 5	1
6 to 15	2
31 to 50	3
51 and above	4 plus one sample for each additional 50 cum or part thereof

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 1.50 meters 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 form work shall also be not made.

B) CONSTRUCTION JOINTS

a) Concreting shall be carried out continuously upto the construction joints, the position and details of which shall be as shown in structural drawing or 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.

b) In case of columns the joints shall be horizontal and 10 to 15 cm below the bottom of the beam running into the column head. The portion of the column between the stepping off level and the top of the slab shall be concreted with the beam.

c) When stopping the concrete on a vertical plane in slabs and beams, an approved stop-board shall be placed with necessary slots for reinforcement bars or any other obstruction to pass the bars freely without bending. The construction joints shall be keyed by providing a triangular or trapezoidal fillet nailed on the stop-board. Inclined or feather joints shall not be permitted. Any concrete flowing through the joints of stop-board shall be removed soon after the initial set. When concrete is stopped on a horizontal plane, the surface shall be roughened and cleaned after the initial set.

d) When the work has to be resumed, the joint shall be thoroughly cleaned and roughened with wire brush and loose particles removed. A coat of neat cement slurry at the rate of 2.75 kg of cement per square metre shall then be applied on the roughened surface before fresh concrete is laid.

C) EXPANSION JOINTS

Expansion joints shall be provided as shown in the structural drawing or as directed by Engineer-in-Charge, for the purpose of general guidance. The filling of the joints with bitumen filler, bitumen felt or any such material and provision of copper plate, etc. shall be paid for separately in running metre. The measurement shall be taken upto two places of decimal stating the depth and width of joint.

D) UNDER WATER CONCRETING

Concrete shall not be deposited under water if it is practicable to dewater the area and place concrete in the regular manner. When it is necessary to deposit concrete under water, the methods, equipment, materials and proportions of the mix to be used shall be submitted to and got approved by the Engineer-in-Charge before the work is started. The water-cement ratio shall not exceed 0.6 and may need to be smaller, depending on the grade of concrete or the type of chemical attack.

E) 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 covering 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 flat horizontal surfaces shall be cured by ponding with water. All other surfaces shall be ensured for curing by moist gunny bags, canvas or any other means till the required period of curing.

F) MANDATORY TESTS:

The testing of materials shall be carried out as per relevant IS: code

G) MEASUREMENTS:

A) Cement concrete/ Reinforced cement concrete: Dimension shall be measured nearest to a cm except for the thickness of slab which shall be measured correct to 0.5cm. The cubical contents shall be worked out nearest 0.01 cum. No deductions shall be made for following:

(a) Ends of dissimilar materials (e.g. joists, beams, post girders, rafters, purlins, trusses, corbels steps etc.) upto 500 sq.cm. in cross section.

(b) Opening upto 0.10 sqm (In calculating area of openings upto 0.1 sqm the size of the opening shall include the thickness of any separate lintels or sills. No extra labour for forming such opening of voids shall be paid for.

(c) The volume occupied by reinforcement

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

(e) For under water concreting measurement of quantity of concrete shall be based on water level at the time of start of execution of concrete work.

B) Under water Cement concrete/ Reinforced cement concrete: The measurement of Under water Cement concrete/ Reinforced cement concrete shall be made similar to above A).

C) Reinforcement: The reinforcement including authorized spacer bars and overlaps shall be measured in lengths of different diameters, as actually used in works nearest to a centimetre and their weight calculated on the basis of coefficient as per standard table given below. Wastage and un-authorised overlaps shall not be paid for

Cross Sectional Area and Mass of Steel Bar as per IS: 1786-1985

Nominal Size mm	Cross Sectional Area Sq.mm	Mass per metre Run kg
6	28.3	0.222
8	50.3	0.395
10	78.6	0.617
12	113.1	0.888
16	201.2	1.58
18	254.6	2.00
20	314.3	2.47
22	380.3	2.98
25	491.1	3.85
28	615.8	4.83
32	804.6	6.31
36	1018.3	7.99
40	1257.2	9.86

H) RATES:

A) Cement concrete/ Reinforced cement concrete: The rates include the cost of all the machinery, materials and labour involved except the cost of form work and reinforcement.

B) Reinforcement: The Rates include the cost of reinforcement and all tools, labour and materials required for all operations such as cleaning of reinforcement bars, straightening, cutting, hooking, bending, placing in position, binding and binding wires etc. as required or as directed including tack welding on crossing of bars in lieu of binding with wires.

Code No	Description	Unit	Rate Rs.

Code No	Description	Unit	Rate Rs.
3.1	Providing and laying nominal mix plain cement concrete with crushed stone aggregate using concrete mixer in all works upto plinth level excluding cost of form work.		
3.1.1	1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40mm nominal size).	cum	2409.00
3.1.2	1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size).	cum	2659.00
3.1.3	1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40mm nominal size).	cum	2970.00
3.1.4	1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 40mm nominal size).	cum	3552.00
3.1.5	1:1½:3 (1 cement : 1½ coarse sand : 3 graded stone aggregate 20mm nominal size).	cum	4073.00
3.2	Providing and laying nominal mix reinforced cement concrete with crushed stone aggregate using concrete mixer in all works upto plinth level excluding cost of form work.		
3.2.1	1:1½:3 (1 cement : 1½ coarse sand : 3 graded stone aggregate 20mm nominal size).	cum	4163.00
3.3	Providing and laying design mix reinforced cement concrete with crushed graded stone aggregate 20mm nominal size using batching plant, transit mixer and concrete pump, in all works upto plinth level excluding cost of form work.		
3.3.1	M-20 Grade	cum	4231.00
3.3.2	M-25 Grade	cum	4298.00
3.3.3	M-30 Grade	cum	4362.00
3.3.4	M-35 Grade	cum	4426.00
3.3.5	M-40 Grade	cum	4490.00
3.4	Extra for laying PCC/RCC of any grade in superstructure above plinth level for every floor or part thereof in addition to rate for foundation and plinth:	cum	97.50
3.5	Providing and laying pre-stressed cement concrete of M-35 grade in superstructure including form work but excluding reinforcement complete as per drawing and specifications and IS : 1343-2012.	cum	6325.00*
3.6	Providing and laying High tensile steel wires/ strands at any level including all accessories i.e. sheathing duct, tube anchorage set, and stressing, stressing operations and grouting with cement complete as per drawing and technical specifications.	kg	145.00*
3.7	Providing and mixing in cement concrete, triangular polyester fiber Recron 3s (Anti-shrinkage Admixture) of 12 mm length of approved make like Reliance industries Ltd etc. in proportion as recommended by manufacturer.	kg	366.00

Code No	Description	Unit	Rate Rs.
3.8	Extra for providing and fixing expanded metal mesh of size 20mm x60mm and strands 3.0mm wide, 1.6 mm thick, weighting 2.64 kg. per sqm for encasing of rolled steel section in beams, columns and grillages but excluding cost of hangers.	sqm	383.00
3.9	Extra for precast PCC/ RCC work of any mix including form work, hoisting and fixing in Cement Mortar. 1:2 (1 Cement : 2 coarse sand) and finishing with cement plaster in Cement Mortar 1:3 (1 Cement : 3 coarse sand) but excluding reinforcement.	cum	469.00
3.10	Extra for laying PCC/ RCC, in or under water or liquid mud including cost of pumping or bailing out of water and removing slush etc. complete:	cum	261.00
3.11	Extra for laying PCC/ RCC, in or under foul conditions.	cum	97.00
3.12	Providing and placing in position reinforcement for R.C.C. work including straightening, cutting, bending, binding etc. complete as per drawings including cost of binding wire in foundation and plinth all complete:		
3.12.1	Thermo-Mechanically treated bars FE 415	kg	54.50
3.12.2	Thermo-Mechanically treated bars FE 500D	kg	54.50
3.12.3	Thermo-Mechanically treated bars FE 550D	kg	55.00
3.12.4	Cold twisted bar / Hot rolled deformed steel	kg	53.50
3.13	Providing and laying damp proof course (upto 50mm thick) with plain cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded crushed stone aggregate 20mm nominal size) including form work.	cum	4237.00
3.14	Providing and mixing water proofing material in PCC/ RCC work in the proportion recommended by the manufacturer.	kg	43.50
3.15	Applying a coat of hot bitumen VG-10 using @ 1.7kg/ sqm on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	sqm	93.50
3.16	Making 50mm thick plinth protection of plain cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded crushed stone aggregate 20mm nominal size) over 75mm bed of dry brick ballast 40mm nominal size well rammed and consolidated and grouted with sand including finishing the top smooth.	sqm	273.00
3.17	Providing and laying 25mm thick eves board/ facia made with cement mortar 1:3 (1 cement: 3 coarse sand) and chicken mesh including cost of form work required but excluding steel reinforcement.	sqm	767.00
3.18	Providing and filling in position, blown bitumen in expansion joints per cm. depth and per cm width.	metre	5.10
3.19	Providing and fixing in position copper plate as per design for expansion joints.	kg	671.00
3.20	Providing and fixing aluminium strip 1.60 mm thick on expansion joints with iron screws as per design to match the colour, shade of wall treatment .	sqm	1397.00

Code No	Description	Unit	Rate Rs.
3.21	Providing and fixing in position impregnated fibre board confirming to IS: 1838 in expansion joints, including cost of primer, sealing compound all complete.		
3.21.1	12 mm thick	sqm	491.00
3.21.2	25mm thick	sqm	768.00
3.22	Providing and fixing 6 mm thick asbestos sheet covering over expansion joints with iron screws as per design to match the colour/shade of wall treatment.	sqm	534.00
3.23	Providing and fixing in expansion joint pre moulded cross linked polymer based filler as per IS:1838 (part III) of approved make including cutting to required size and shape etc complete.		
3.23.1	12 mm thick	sqm	590.00
3.23.2	25 mm thick	sqm	1110.00
3.23.3	50 mm thick	sqm	2207.00
3.24	Providing and applying for hermetically water proof sealing of vertical / horizontal expansion joint with approved make Poly Sulphide Sealant compound (two component elastomeric sealant) having 80% tensile modulus elongation, proper bonding with building surface complete with cleaning and preparing of building surface, applying polymer solvent primer, providing and fixing PU back up rod of suitable dia in expansion joint for core making, filling with Poly Sulphide Sealant (Sealant filling depth should be minimum half of the joint gap), finishing and smoothing the surface etc complete. The application shall be got done through the authorised applicator of the manufacture of compound		
3.24.1	For gap upto 25 mm wide	metre	520.00
3.24.2	For gap 40 mm wide	metre	962.00
3.24.3	For gap 50 mm wide	metre	1397.00

Note * **These items are to be executed only with prior permission of Chief Engineer**

4.0 WATER PROOFING

A) GENERAL

Water proofing means to make the structure leak proof. The appropriate water proofing material should be used for water proofing depending upon the location and situation of the structure.

Every water proofing treatment should be guaranteed for 5 years by the contractor from the date of completion of water proofing treatment in prescribed guarantee bond.

The work shall be executed as per the norms and methodology prescribed by the manufacturer of the water proofing compound.

B) MATERIALS

The materials to be used in water proofing shall be as specified in the item. Water proofing compound manufactured by reputed manufacturer like Cico, Impermo, Pidilite etc. bearing ISI mark conforming to IS 2645 shall only be used. Water proofing compound may or may not be required to be mixed with cement as prescribed by the manufacturer.

C) PREPARATION OF THE SURFACE

Surface preparation shall be as per item of water proofing treatment to be executed, prescribed by the manufacturer, CPWD Specifications and as instructed by Engineer-in-Charge.

. D) LAYING

After preparation of surface the water proofing treatment should be laid as specified by the manufacturer and as per the requirement of the item to be executed.

E) CURING & POST TREATMENT APPLICATIONS

Curing and post treatment applications, if required shall be as per requirement of item.

F) MEASUREMENT

(i) For area length and breadth shall be measured along the finished surface correct to a cm and area shall be worked out to nearest square metre nearest to two decimal. The measurement shall be taken along the finish surface of treatment including the rounded and taper portion at junction of parapet wall. Overlaps shall not be measured.

(ii) For volume length and breadth shall be measured along the finished surface correct to a cm and thickness shall be measured correct to 5mm and the cubical contents of consolidated concrete/mortar shall be worked out in cum with 3 places of decimal i.e. 0.001 cum. For grading items concrete/ mortar laid in excess of the dimension shown in the drawing shall not be measured.

(iii) No deduction in measurement shall be made for either openings or recesses or chimney stack, roof lights or Khurras or area upto 0.40 sqm, nor any thing extra shall be paid for forming such openings, recesses etc. For areas exceeding 0.40 sqm deduction will be made in the measurement for the full openings and nothing extra shall be paid for making such openings.

(iv) Length shall be measured correct to a cm and net quantities shall be calculated up to two places of decimal for water stops

G) RATE

The rates include cost of all materials, labour, T & P, wastages, water for curing, hire & running charges of all type of machineries required and all lead & lifts of all materials etc. complete

4.0 WATER PROOFING

Code No	Description	Unit	Rate Rs.
4.1	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for underground structures using rough Kota stone and consisting of: i) 1st layer of 22mm to 25mm thick approved rough Kota 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 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. iii) Finishing top with stone aggregate of 10mm to 12mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.	sqm	672.00
4.2	Providing and laying integral cement based treatment for water proofing on the vertical surface at all levels by fixing 22 mm to 25mm thick rough Kota stone slab with cement slurry mixed with water proofing compound conforming to IS:2645 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 20mm thick cement mortar 1:3 (1 cement : 3 coarse sand) with neat cement punning mixed with water proofing compound complete.	sqm	719.00
4.3	Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of WC, kitchen and the like consisting of: i) 1st course of applying cement slurry @ 4.4 Kg/sqm mixed with water proofing compound conforming to IS 2645 including rounding off junction of vertical and horizontal surface. ii) 2nd course of 20mm cement plaster 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound including rounding off junction of vertical and horizontal surface. iii) 3rd course of applying blown or residual bitumen applied hot @ 1.7 Kg. per sqm of area. iv) 4th course of 400 micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 Kg. per sqm of area.	sqm	445.00
4.4	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 :		

Code No	Description	Unit	Rate Rs.
4.4.1	Serrated with central bulb (225mm wide, 8-11mm thick).	metre	455.00
4.4.2	Dumb bell with central bulb (180mm wide, 8mm thick).	metre	410.00
4.4.3	Kickers (320mm wide, 5mm thick).	metre	421.00
4.5	Providing and laying water proofing treatment in sunken portion of WCs, bathroom, kitchen etc., by applying cement slurry mixed with water proofing cement compound consisting of following applications including surface preparation: i) 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. ii) 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 treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	sqm	182.00
4.6	Providing and laying water proofing treatment on roofs of slabs by applying cement slurry mixed with water proofing cement compound consisting of following applications including surface preparation: i) 1st layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. ii) 2nd 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. iii) 3rdlayer of 1.5 mm thickness consisting of slurry of cement @ 1.289 kg/sqm mixed with coarse sand @ 1.289 kg/sqm and water proofing cement compound @ 0.07 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. iv) 4th 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	283.00
4.7	Providing and laying integral cement based water proofing treatment on roofs, balconies, terraces etc with average thickness of 120mm and minimum thickness at khurra as 65 mm, consisting of following operations including surface preparation: i) Applying a slurry coat of neat cement using 2.75 kg/sqm. of cement mixed with water proofing compound conforming to IS. 2645 over the RCC slab including adjoining walls upto 300mm height. ii) 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) mixed with water proofing compound conforming to IS : 2645 over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) mixed with water proofing compound conforming to IS : 2645 to required slope and treating similarly the adjoining walls upto 300 mm height including	sqm	611.00

Code No	Description	Unit	Rate Rs.
	rounding of junctions of walls and slabs. iii) 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. iv) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) mixed with water proofing compound conforming to IS : 2645 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. v) 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:		
4.8	Providing and laying six course damp proof treatment in basement, sump, reservoir etc. consisting of first, third, fifth course of blown type petroleum bitumen of IS grade 85/25 hot @ 1.6kg/ sqm and 2nd & 4th course of self finished bitumen tar felt with priming coat with bitumen solution applied at the rate of 0.25 litre per sqm and sixth and final course of stone grit 6mm and down pea sized gravel spreaded at 0.008 cum per sqm including preparation of surface by grouting cracks, providing C.C. fillets, rounding of corners and cleaning and drying of the surface before priming coat is applied complete.		
4.8.1	With bitumen felt of type 2, grade 2 (Fibre base) in 2nd and 4th course.	sqm	402.00
4.8.2	With bitumen felt of type 3, grade 2 (Hessian base) in 2nd and 4th course.	sqm	390.00
4.8.3	With bitumen felt of type 2, grade 2 (Fibre base) in 2nd course and & type 3, grade 2 (Hessian base) in 4th course.	sqm	396.00
4.9	Providing and laying eight course damp proofing treatment in basement, sumps, reservoirs etc. consisting of first, third, fifth and seventh course of blown type petroleum bitumen of IS grade 85/ 25 applied hot at the rate of 1.60kg/ sqm. and 2nd 4th, 6th course of self finished bitumen tar felt with priming coat with bitumen solution applied at the rate of a minimum 0.25 litre per sqm eight and final course of stone grit 6mm and down pea sized gravel spreaded at 0.008 cum per sqm including preparation of surface by grouting cracks, providing C.C. fillets, rounding of corners and cleaning and drying of the surface before priming coat is applied complete.		
4.9.1	With bitumen felt of type 2, grade 2 (Fibre base) in 2nd, 4th & 6th course.	sqm	564.00
4.9.2	With bitumen felt of type 3, grade 2 (Hessian base) three courses.	sqm	545.00
4.9.3	With bitumen felt of type 2 grade 2 (Fibre base) in two courses, one course with type 3 grade 2 (Hessian base).	sqm	558.00
4.9.4	With bitumen felt of type 2, grade 2 (Fibre base) one course and two courses with type 3 grade 2 (Hessian base).	sqm	552.00
4.10	Providing and laying three course damp proofing treatment in water reservoir, sump, tank etc., with bitumen felt and blown type petroleum bitumen at the rate of 1.6 Kg/sqm 1st, 3rd course and 2nd course with tar		

Code No	Description	Unit	Rate Rs.
	felt including applying priming coat at the rate of 0.25 litre per sqm and fillets and rounding corners, wherever required, complete.		
4.10.1	Bitumen felt of type 2 grade 2 (Fibre base)	sqm	321.00
4.10.2	With tar felt (Hessian base) type 3 grade 2.	sqm	309.00
4.11	Supplying and applying bituminous solution primer on roof and or wall surface at 0.24 litre per sqm.	sqm	20.50
4.12	Deduct for omitting in water proofing treatment final course of spreading stone grit 6mm down size or pea sized gravel :		
4.12.1	At 6 cudm per sqm.	sqm	11.50
4.12.2	At 8 cudm per sqm.	sqm	13.50
4.13	Grading roof for water proofing treatment with:		
4.13.1	Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	cum	3817.00
4.13.2	Cement mortar 1:3 (1 cement : 3 coarse sand)	cum	4612.00
4.13.3	Cement mortar 1:4 (1cement : 4 coarse sand)	cum	3801.00
4.14	Providing and fixing 2mm thick (for corrugated roof sheets) APP (Atactic Polypropylene Polymer) modified prefabricated five layer 2mm thick water proofing membrane, 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 membrane manufacture of density at 25°C, 0.87 - 0.89 kg/ ltr and viscosity 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: 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.	sqm	269.00
4.15	Providing and laying 3mm thick 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 viscosity 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 : 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.	sqm	358.00

Code No	Description	Unit	Rate Rs.
4.16	Providing and laying 3mm thick 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 viscosity 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.	sqm	396.00
4.17	Extra for covering top of membrane with Geotextile, 120gsm non woven, 100% polyester of thickness 1 to 1.25mm bonded to the membrane with intermittent touch by heating the membrane by Butane Torch as per manufactures recommendation.	sqm	51.50
4.18	Providing and fixing broken glazed tiles on top of hot bitumen @ 1.00 kg/ sqm (0.80 kg-85/25 grade and 0.20 kg -80/100 grade) and joint filled with cement mortar 1:2 (1 cement :2 marble dust) mixed with water proofing compound complete.	sqm	134.00
4.19	Providing water proofing treatment against dampness & Seepage on RCC or lime concrete roof/ terrace, over head tank, sunken slab consisting of following operations: i) Removing loose material and 25 mm cement concrete/ cement plaster including gola etc. and cleaning the surface. ii) Drilling 20mm dia holes spacing not more than 300 mm center to center in cracks and joint of wall & slab. iii) Injecting polymer based high strength water proofing compound of approved brand & make, admixed with cement in the ratio as specified by manufacturer, in holes by pressure pump. iv) Leveling the surface by providing and laying 25mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 12.5/6mm) mixed with polymer based high strength water proofing compound of approved brand & make in the ratio as specified by manufacturer. v) Providing and laying of bonding slurry prepared by mixing of cement with approved make and brand acrylic polymer (as per IS 13435 Part-3) in two layers (totaling up-to 3mm thick) by brush. Second layer to be laid after 4 hours of first layer. vi) Providing and laying 15mm thick cement plaster in cement mortar 1:4 (1 cement : 4 coarse sand) and finishing the surface with neat cement admixed with integral water proofing compound (IS: 2645) as per manufacturers recommendations. This operation shall be continued upto 300 height on parapet wall. vii) After a short period of above operation a string marking shall be done making squares of 300x300mm.	sqm	735.00*

Code No	Description	Unit	Rate Rs.
4.20	Providing post water proofing treatment against dampness & Seepage in walls of basement, plinth, super structure (horizontal or vertical) consisting of following operations: i) Removing loose material and cleaning the surface. ii) Drilling 20mm dia holes in walls/ floor in zigzag manner spacing not more than 150 mm center to center. iii) Injecting polymer based high strength water proofing compound of approved brand & make, admixed with cement in the ratio as specified by manufacturer, in holes by pressure pump. iv) Plugging holes with polymer compound admixed with cement. v) Providing and laying of bonding slurry prepared by mixing of cement with approved make and brand acrylic polymer (as per IS 13435 Part-3) in two layers (totaling up-to 3mm thick) by brush. Second layer to be laid after 4 hours of first layer. vi) Providing and laying 15mm thick cement plaster in cement mortar 1:4 (1 cement : 4 coarse sand) and finishing the surface with neat cement admixed with integral water proofing compound (IS: 2645) as per manufacturers recommendations.	sqm	692.00*
4.21	Providing post water proofing treatment against dampness & Seepage in roof, terraces, sunken floor of toilets with reinforced acrylic breathable (polymer content 35%, elongation at break at > 100%) coating consisting of following operations: i) Removing loose material and cleaning the surface. ii) Priming in one coat with water based acrylic emulsion. iii) Three coats with reinforced acrylic breathable polymer.	sqm	611.00*
4.22	Providing Water proofing treatment over Roof, Wall, Chhajjas, Balcony with Diamond Shield and Sealer coat or equivalent at leakage/ seepage area consisting of the operation: (i) Surface preparation roughening of surface, opening of cracks in 'V' groove in size of 5mm x 10m (WxD), filling of cracks with putty of Diamond shield with laying fiber glass mesh, Cleaning of surface by scrubbing with steel wire/ Nylon brush. Removing all dust particles and washing with adequate water to clean completely. (ii) Providing and applying 1st coat of diamond shield or equivalent compound (having two component dry powder 80% Chemical 20% (chemical having 30% solid contents) making flexible waterproof and protective modified mortar with minimum thickness 70-80 micron after proper mixing of both the parts of compound along with laying of fiber glass mesh (of weaving size of 10x10 yarn/inch duly coated with alkaline resistant polymer). Allow the coating to set in natural air for minimum 2 Hrs. After 1st coat apply 2nd coat with minimum thickness 100 micron of the same compound. Allow the 2nd coat to set in natural air for minimum 4 Hrs. Total consumption of the diamond shield or equivalent in both coat should be @ 17.90 kg for 10sqm area.	sqm	421.00

Code No	Description	Unit	Rate Rs.
	(iii) Over the above layers providing and applying 1st coat of sealer compound (Single component High Build elastomeric, flexible, pure acrylic waterproofing membranes having solid content of 65%) minimum 50-60 micron and allow it to set in natural air for minimum 2 Hrs. After 1st coat apply 2nd and final coat 120-140 micron of sealer compound and allow it to set in natural air for minimum 4 Hrs. Consumption of Sealer compound should be @ 5.40 kg per 10 sqm area. The final area appearance of the coating will be milky white.		
	(iv) The treated area should be cure with water for 48 hrs by flooding the surface. All above operations to be done in order.		
Note	* **These items are to be executed only with prior permission of Chief Engineer**		

5.0 MORTARS

MATERIALS

1. **Cement:** Cement to be used in the work, shall be either ordinary portland cement 33 grade conforming to IS: 269 or ordinary portland cement 43 grade conforming to IS: 8112 or ordinary Portland cement 53 grade conforming to IS: 12269, or portland slag cement conforming to IS: 455.

2. **Sand:** Sand to be used in mortar for plaster work shall conform to IS: 1542-1977 and for masonry and flooring work shall confirm to IS 2116-1980.

   Sand for use in masonry and plaster mortar should fulfill the following grading requirements.

   Grading of sand for use in masonry mortar (coarse sand) as per IS: 2116-1980

IS Sieve Designation	Percentage passing by mass	Ref to method of test
4.75 mm	100	
2.36 mm	90 to 100	IS: 2386 (Part I)-1963
1.18 mm	70 to 100	
600 micron	40 to 100	
300 micron	5 to 70	
150 micron	0 to 15	

   Grading of sand for use in plaster mortar (fine sand) as per IS: 1542-1977

IS Sieve Designation	Percentage passing by mass
10 mm	100
4.75 mm	95-100
2.36 mm	95-100
1.18 mm	90-100
600 micron	80-100
300 micron	20-65
150 micron	0-50

3. **Water:** Water used for mixing and curing shall be clean and free from injurious quantities of oils, acids, alkalis, salts, sugar, organic vegetable growth or other substances that may be deleterious to bricks, stone, concrete or steel. Potable water is generally considered satisfactory for preparing mortars. The water used for work should be in accordance with IS: 3025-1986.

4. **Cement Mortar:** Cement and sand shall be mixed in specified proportions given in the item of work. All mortars shall be mixed with a minimum quantity of water to produce desired work-ability 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.

   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. Initial 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 but this retempering shall not be permitted after 30 minutes. Mortar, unused for more than 30 minutes, shall be rejected and removed from site.

Code No	Description	Unit	Rate Rs.
5.1	Cement Mortar 1:1 (1 cement : 1 fine sand)	cum	5982.00
5.2	Cement mortar 1:2 (1 cement : 2 fine sand).	cum	4231.00
5.3	Cement mortar 1:3 (1 cement : 3 fine sand).	cum	3356.00
5.4	Cement mortar 1:4 (1 cement : 4 fine sand).	cum	2654.00
5.5	Cement mortar 1:5 (1 cement : 5 fine sand).	cum	2276.00
5.6	Cement mortar 1:6 (1 cement : 6 fine sand).	cum	1952.00
5.7	Cement mortar 1:2 (1 cement : 2 coarse sand).	cum	4231.00
5.8	Cement mortar 1:3 (1 cement : 3 coarse sand).	cum	3356.00
5.9	Cement mortar 1:4 (1 cement : 4 coarse sand).	cum	2654.00
5.10	Cement mortar 1:5 (1 cement : 5 coarse sand).	cum	2276.00
5.11	Cement mortar 1:6 (1 cement : 6 coarse sand).	cum	1952.00
5.12	Cement mortar 1:8 (1 cement : 8 Coarse sand).	cum	1628.00
5.13	Cement mortar 1:2 (1 cement : 2 stone dust).	cum	4231.00
5.14	Cement mortar 1:2 (1 cement : 2 marble dust).	cum	5029.00
5.15	White cement mortar 1:5 (1 white cement : 5 marble dust).	cum	3175.00
5.16	White cement mortar 1: 2 (1 white cement : 2 marble dust).	cum	10877.00
5.17	White cement mortar 1:3 (1 white cement : 3 marble dust).	cum	8641.00
5.18	White cement mortar 1:5 (1 white cement : 5 marble dust)	cum	5841.00
5.19	Cement mortar 1:1:3 (1 cement : 1 marble dust : 3 stone dust)	cum	5398.00
5.20	Mud mortar	cum	244.00
5.21	Cement Concrete 1: 6 : 12 (1 cement : 6 coarse sand : 12 crushed stone aggregate 12.5mm)	cum	2428.00

6.0 STONE WORK

A) GENERAL

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

ii) 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.

iii) 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.

iv) The length of stones shall not exceed three times its height nor shall they be less than twice its height plus one joint. No stone shall be less in width than the height and the width. On the base shall not be greater than three-fourth of the thickness of the wall nor less than 150mm.

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

B) SURFACING OR DRESSING OF STONES

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 requirements for dressing of stone covered in IS: 1129.

i) **R.R. Masonry :** Each stone shall be hammer dressed on the face, the sides and the bed. 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 full and 10 mm on the full to be plastered.

ii) **Course Rubble Masonry:** Face stones shall be hammer dressed on all beds, and joints so as to give them approximately rectangular block shape. These shall be squared on all joints and beds. The bed joint shall be rough chisel dressed for atleast 8cm back from the face, and side joints for at least 4cm such that no portion of the dressed surface is more than 6 mm from a straight edge placed on it. The bushing on the face shall not project more than 4cm as an exposed face and one cm. on a face to be plastered. The hammer dressed stone shall also have a rough tooling for minimum width of 2.5cm along the four edges of the face of the stone, when stone work is exposed.

iii) **Plain ashlar masonry:** Every stone shall be cut to the required size and shape, so as to be free from waviness and to give truly vertical and horizontal joints. In exposed masonry, the faces that are to remain exposed in the final position and the adjoining faces to a depth of 6mm shall be the fine chisel dressed so that when the checked with 60 cm straight edge, no point varies from it by more than 1mm. The top and bottom faces that are to form the bed joints shall be chisel dressed so that variation from 60 cm straight edge at no point exceeds 3 mm. Faces which are to form the vertical joints should be chisel dressed so that variation at any point with 60cm straight edge does not exceed 6mm. any vertical face that is to come against backing of masonry shall be dressed such that variation from straight edge does not exceed 10mm. All angles and edges that are to remain exposed in the final position shall be true, square and free from chippings.

iv) **Punched ashlar masonry**: Shall be as specified in plain Ashlar masonry (iii) except that the faces exposed in view shall have a fine dressed chisel draft 2.5 cm wide all round the edges and shall be rough tooled between the drafts, such that the dressed surface shall not be more than 3mm from a straight edge placed over it.

v) **Stone veneering work**: Shall be as specified plain Ashlar masonry (iii) except that dressing at the back shall not be done, so as to ensure better grip with the hearting or backing. The dressed slabs shall be of the thickness as specified, with permissible tolerance of 2mm.

A sample of dressed stone shall be prepared for approval of Engineer-in-Charge. It shall be kept at the worksite as a sample after being approved.

C) TERMINOLOGY IN STONE DRESSING

The stones are dressed to have different surfaces as indicated below.

(i) **Template or Bed Block -** A block of stone or concrete bedded on a wall to distribute the pressure from a concentrated load.

(ii) **Self Face Surface -** Surfaces of stone slabs used for roofing flooring, lintels etc. as obtained from quarry.

(iii) **Squared Back Surface -** Means the surface shall be dressed back at right angles to the face of the stone.

(iv) **Chisel Drafted Margin -** The dressing done with a drafting chisel in narrow strips of width generally 2 to 5 cm. Chisel drafted margin shall be punch dressed.

(v) **Hammer Dressed Surface -** A hammer dressed stone shall have no sharp and irregular corners and shall have a comparatively even surface so as to fit well in masonry. Hammer dressed stone is also known as hammer faced, quarry faced and rustic faces. The bushing from the general wall face shall not be more than 40mm on exposed face and 10mm on faces to be plastered

(vi) **Rock Faced Surface -** A rock faced stone shall have a minimum of 25mm wide chisel drafted margin at the four edges, all the edges being in the same plane.

(vii) **Rough Tooled Surface -** A rough tooled surface shall have a series of bands, made by means of a plane chisel 4 to 5 cm wide, more or less parallel to tool marks all over the surface. These marks may be either horizontal, vertical or at an angle of 450 as directed. The edges and corners shall be square and true. The depth or gap between the surface and straight edge, held against the surface shall not be more than 3mm (Rough tooled stones are used where fairly regular plane faces are required for masonry work).

(viii) **Punched Dressed Surface -** A rough surface is further dressed by means of punch chisel to show series of parallel ridges. The depth of gap between the surface and a straight edge held against the surface shall not exceed 3 mm. Punched dressed stones are used where even surfaces are required.

(ix) **Close Picked Surface -** A punched stone is further dressed by means of point chisel so as to obtain a finer surface, ridges or chisel marks left over being very tiny. The depth of gap between the surface and a straight edge kept over the surface shall not exceed 1.5 mm

(x) **Fine Tooled Surface -** Close picked surface is further dressed so that all the projections are removed and fairly smooth surface is obtained. The surface shall have 3 to 4 lines per centimetre width depending on the degree of hardness of stone and degree of fineness required. This type of dressing is commonly adopted for ashlar work.

(xi) **Polished Surface -** Surface having a high gloss finish. Polishing of stones shall be done by robbing them with suitable abrasive, wetting the surface where necessary with water. Alternatively polishing of stones shall be done by holding them firmly on the top of revolving table to which some abrasive material like sand or carborundum is fed. The final polishing shall be performed by rubber or felt, using oxide of lime (Called by trade name as putty powder) as a polishing medium

.

(xii) **Moulded -** Cut to profile of a moulding with punched dressed surfaces, unless otherwise specified

D) LAYING

(i) 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.

(ii) 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.

(iii) Stones in he 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 thoroughly and then poured in the joints. No dry or hollow space shall be left any where in the masonry and each stone shall have all the embedded faces completed covered with mortar.

(iv) 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.

(v) 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. At least one band stone or a set of band stones shall be providing for every 0.5 sqm of the area of wall surface. All band stones shall be marked suitably with paint as directly by Engineer-in-Charge.

(vi) In case, headers are not available, precast headers of M 15 concrete shall be used. Cast-in-situ headers are not permitted.

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

(viii) In band work at all angle junctions of walls, the stones at each alternate course shall be carries into each of the respective walls so as to unite the work thoroughly.

(ix) 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.

(x) 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.

(xi) 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.

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

(xiii) 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 degree with the horizontal.

(xiv) Quoin stone i.e. stone specially selected and neatly dressed for forming an external angle in masonry work, shall not be less than 0.03 cubic metre in volume.

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

D) PROTECTION

Green work shall be protected from rain by suitable covering. The work shall also be suitably protected from damage mortar dropping and rain during construction.

E) CURING

Masonry work in cement mortar shall be kept constantly moist on all faces for a minimum period of seven days.

F) MEASUREMENTS

a) The length, height and thickness shall be measured in metres with minimum unit of 1 cm. The quantity of volume and area shall be calculated in cum and sqm respectively correct to two places of decimal.

b) The thickness of the wall shall be measured at the joints excluding bushing. Only specified dimensions shall be allowed anything extra shall be ignored.

c) No deduction shall be made nor extra payment shall be made for the following.

i) Ends of dissimilar materials (that is joists, beams, lintels, posts, girders, rafters purlins, trusses, corbels, steps etc.) upto 0.1 sqm in section.

ii) Opening each upto 0.1 sqm in area. In calculating the area of openings, any separate lintels or sill shall be included along with the size of opening but the end portions of the lintels shall be excluded and the extra width of rebated reveals, if any, shall also be excluded.

iii) Wall plates and bed plates, and bearing of chajjas and the like, where the thickness does not exceed 10cm and the bearing does not extend over the full thickness of the wall.

Note: The bearing of floor and roof shall be deducted from wall masonry.

iv) Drain holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.

v) Building in masonry, iron fixture, pipes upto 300mm dia, hold fasts of doors and windows etc.

vi) Forming chases in masonry each upto section of 350 sqcm.

d) Extra payment shall be allowed for stone work in square or rectangular or circular pillars or curved masonry over the rate of stone work in walls.

F) RATES:

The rate includes the cost of all materials, labour, machinery, tools required to execute the work including scaffolding, racking out of joints for plastering or pointing, preparing tops and sides of existing walls and curing etc. complete.

Code No	Description	Unit	Rate Rs.
6.1	Random rubble masonry with hard stone in foundation and plinth in Cement Mortar 1:6 (1 Cement : 6 Coarse Sand) including leveling up with cement concrete 1:6:12 (1 cement : 6 coarse sand: 12 stone aggregate 20mm nominal size) upto plinth level.	cum	2515.00
6.2	Extra for random rubble masonry with hard stone in superstructure above plinth level for every floor or part thereof in addition to rate for foundation and plinth:	cum	203.00
6.3	Extra for random rubble masonry with hard stone in square or rectangular pillars.	cum	191.00
6.4	Extra for random rubble masonry with hard stone in circular pillars.	cum	651.00
6.5	Extra for random rubble masonry with hard stone curved on plan for a mean radius not exceeding 6.00m.	cum	287.00
6.6	Coursed rubble masonry (Second sort) with hard stone in Cement mortar 1:6 (1 cement : 6 coarse sand) upto plinth level.	cum	2599.00
6.7	Extra for Coursed rubble masonry with hard stone (Second Sort) in superstructure above plinth level for every floor or part thereof in addition to rate for foundation and plinth:	cum	264.00
6.8	Extra for coursed rubble masonry with hard stone (Second Sort) in square or rectangular pillars.	cum	212.00
6.9	Extra for coursed rubble masonry with hard stone (Second sort) in circular pillars.	cum	734.00
6.10	Extra for coursed rubble masonry with hard stone (Second Sort) curved on plan for a mean radius not exceeding 6.0m	cum	287.00
6.11	Extra for laying stone work, in or under water and or liquid, mud including cost of pumping/ bailing out water and removing slush etc. complete.	cum	365.00
6.12	Extra for laying stone work, in or under foul conditions.	cum	97.00

7.0 BRICK WORK

A) GENERAL:

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

B) PROPERTIES & CLASSIFICATION OF BRICKS:

Burnt clay bricks: Burnt clay bricks shall conform to the requirements of IS: 1077. Bricks shall be hand moulded or machine moulded. They shall be free from nodules of free lime, visible cracks, flaws, warp edge and organic mater. The bricks shall have smooth rectangular faces with sharp corners and emit a clear ringing sound. Bricks having minimum compressive strength of 35 kg/ sqcm shall be used in load bearing structure only.

Fly Ash Lime Bricks: Fly ash brick shall conform to the requirements of IS: 12894-2002. The bricks shall be sound, compact and uniform in shape and colour. The bricks shall be free from visible cracks, flaws, warp edge and organic matter.

Classification: Bricks/ brick tiles shall be classified on the basis of their minimum compressive strength as given below.

Table 1

Class Designation	Average Compressive Strength			
	Not less than		Less than	
	N/mm^2	(Kgf/cm^2)	N/mm^2	(Kgf/cm^2)
10	10	(100)	12.5	125
7.5	7.5	(75)	10	100
5	5	(50)	7.5	75
4	4	(40)	5.0	50
3.5	3.5	(35)	4.0	40
2.5	2.5	(25)	3.5	35
2	2.0	(20)	2.5	25

Dimension: The brick may be non-modular or modular. Sizes for both types of brick/tiles shall be as per Table 1 given below. Non-modular bricks/ tiles of sizes other than the size mentioned in Table 1 may also be used wherever standard size is not available.

Table 2

Type of Bricks/ Tiles	Nominal Size mm	Actual Size mm
Non-modular bricks	229x114x70mm	225x111x70mm
Non-modular tile bricks	229x114x44mm	225x111x44mm
Modular bricks	200x100x100mm	190x90x90mm
Modular tile bricks	200x100x40mm	190x90x40mm

C) MORTAR:

The mortar for the brick work shall be as specified, and as per details given in Chapter V of this SOR.

D) SOAKING OF BRICKS:

Bricks shall be soaked in water before use for a period of minimum one hour prior to being laid. When the bricks are soaked they shall be removed from the tank sufficiently early so than at the time of laying they are skin-dry. Such soaked bricks shall be stacked on a clean place where they are not again spoiled by dirt earth etc.

E) LAYING:

(i) Bricks shall be laid in English Bond unless specified otherwise. For brick work in half brick wall, bricks shall be laid in stretcher bond. Half or cut bricks shall not be used except as closer where necessary to complete the bond. Closers in such cases, shall be cut to the required size and used near the ends of the wall. Header bond shall be used preferably in all courses in curved plan for ensuring better alignment.

(ii) All loose materials, dirt and set lumps of mortar which may be lying over the surface on which brick work is to be freshly started, shall be removed with a wire brush and surface wetted.

(iii) Bricks shall be laid on a full bed of mortar. When laying, each brick shall, be properly bedded and set in position by gently pressing with the handle of a trowel, Its inside face shall be buttered with mortar before the next bricks is laid and pressed against it. Joints shall be fully filled and packed with mortar such that no hollow space are left inside the joints.

The thickness of the joints shall not be more than 10 mm in both the direction.

(iv) Bricks shall be laid with frog (where provided) up. However when top course is exposed, bricks shall be laid with frog down. For the bricks to be laid with frog down, the frog shall be filled with mortar before placing the brick in position.

(v) In case of wall one brick thick and under, one face shall be kept even and in proper plane, while the other face may be slightly rough. In case of wall more than one brick thick, both the faces shall be kept even and in proper plane.

(vi) 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.

(vii) During construction, no part of work shall rise more than one metre above the general construction level, to avoid unequal settlement and improper jointing. Where this in not possible in the opinion of the Engineer, 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. Toothing may also be permitted where future extension is contemplated. For half brick partition to be keyed into main walls, indents shall be left in the main walls.

(viii) 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.

(ix) 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.

(x) 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.

(xi) Care shall be taken during construction that edges of jambs, sills and projections are not damaged in case of rain. New built work shall be covered with gunny bags or tarpaulin so as to prevent the mortar from being washed away. Damage, if any, shall be made good to the satisfaction the Engineer-in-Charge.

F) SCAFFOLDING:

The Scaffolding used for execution shall be sound, strong and safe to withstand all dead, live and impact loads which are likely to come on them. Scaffolding shall be provided to allow easy approach to every part of the work The holes which provide resting space for horizontal members shall not be left in masonry under one metre in width or immediately near the skew backs of arches. The holes left in the masonry work for supporting the scaffolding shall be filled and made good. Scaffolding shall be got approved by the Engineer-in-Charge. However, the Contractor shall be responsible for its safety

G) PROTECTIONS & CURING:

(i) Green work shall be protected from rain by suitable covering. Finished work shall be kept constantly moist on all faces for a minimum period of seven days. Bricks work carried out during the day shall be suitable marked indicting the date on which the work is done so as to keep a watch on the curing period.

(ii) During hot weather, all finished or partly completed work shall be covered and wetted in such a manner as will prevent raid drying of the brickwork.

(iii) 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. If the mortar perish i.e. become dry, white or powdery due to neglect of curing, work shall be pulled down and rebuilt as directed by the Engineer-in-Charge.

H) TESTING: Testing of bricks before use shall be done for water absorption, compressive strength and dimensional tolerances as per relevant BIS codes.

I) MEASUREMENT:

(a) Brick work shall be measured in cubic metre or square metre as specified in the item. Any extra work over the specified dimensions shall be ignored. Dimensions shall be measured correct to the nearest 0.01 m i.e. 1cm. Areas shall be calculated to the nearest 0.01 square metre and the volume shall be worked out to the nearest 0.01 cubic metre.

(b) 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.

(c) No deductions or additions shall be done and no extra payment made for the following :

(i) Ends of dissimilar materials (i.e, joists, beams, lintels, posts, girders, rafters, purlins, trusses, corbels, steps, etc.); up to 0.1 m^2 in section.

(ii) Opening up to 0.1 m^2 in area
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.

(iii) 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.

(iv) Cement concrete blocks as for hold fasts and holding down bolts.

(v) Iron fixtures, such as wall ties, pipes upto 300 mm diameter and hold fasts for doors and windows.

(vi) Chases of section not exceeding 50 cm in girth.

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

(d) Extra payment shall be allowed for brick work in square or rectangular pillars or circular pillars or curved masonry over the rate of brick work in walls as detailed in item.

(e) Extra payment shall be made for brick work at a height more than 4.0 metre from immediate below floor level.

J) RATE:

The rate includes the cost of all materials, labour, machinery and tools required to execute the work including scaffolding, racking out of joints for plastering or pointing, preparing tops and sides of existing walls and curing etc. complete.

7.0 BRICK WORK

Code No	Description	Unit	Rate Rs.
7.1	Brick work with modular well burnt clay bricks of crushing strength not less than 35 kg/sqcm and water absorption not more than 20% in foundation and plinth in:		
7.1.1	Cement Mortar 1:3 (1 Cement : 3 Coarse Sand)	cum	4199.00
7.1.2	Cement Mortar 1:4 (1 Cement : 4 Coarse Sand)	cum	4010.00
7.1.3	Cement Mortar 1:5 (1 Cement : 5 Coarse Sand)	cum	3908.00
7.1.4	Cement Mortar 1:6 (1 Cement : 6 Coarse Sand)	cum	3821.00
7.2	Brick work with modular well burnt clay bricks of crushing strength not less than 25 kg/sqcm and water absorption not more than 20% in foundation and plinth in:		
7.2.1	Cement Mortar 1:5 (1 Cement : 5 Coarse Sand)	cum	3722.00
7.2.2	Cement Mortar 1:6 (1 Cement : 6 Coarse Sand)	cum	3635.00
7.2.3	Cement Mortar 1:8 (1 Cement : 8 Coarse Sand)	cum	3548.00

Code No	Description	Unit	Rate Rs.
7.3	Brick work with non-modular well burnt (open bhatta) clay bricks of crushing strength not less than 20 kg/sqcm and water absorption not more than 25% in foundation and plinth in:		
7.3.1	Cement Mortar 1:6 (1 Cement : 6 Coarse Sand)	cum	3080.00
7.3.2	Cement Mortar 1:8 (1 Cement : 8 Coarse Sand)	cum	2989.00
7.4	Brick work with modular well burnt (open bhatta) clay bricks of crushing strength not less than 20 kg/sqcm and water absorption not more than 25% in foundation and plinth in:		
7.4.1	Cement Mortar 1:6 (1 Cement : 6 Coarse Sand)	cum	3263.00
7.4.2	Cement Mortar 1:8 (1 Cement : 8 Coarse Sand)	cum	3176.00
7.5	Brick work with modular fly-ash lime bricks (FaLG Bricks) confirming to IS:12894-2002 of class designation 4.0 in foundation and plinth in:		
7.5.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	cum	3641.00
7.5.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	cum	3452.00
7.5.3	Cement Mortar 1:5 (1 cement : 5 coarse sand)	cum	3350.00
7.5.4	Cement Mortar 1:6 (1 cement : 6 coarse sand)	cum	3263.00
7.5.5	Cement Mortar 1:8 (1 cement : 8 coarse sand)	cum	3157.00
7.6	Extra for brick work in superstructure above plinth level for every floor or part thereof in addition to rate for foundation and plinth:	cum	121.00
7.7	Extra for brick work in square and rectangular pillars. (size not more than 600mm in any direction)	cum	185.00
7.8	Extra for brick work curved on plan upto mean radius not exceeding 6 m including form work.	cum	390.00
7.9	Half brick thick (9cm) brick masonry with modular well burnt clay bricks of crushing strength not less than 35 kg/sqcm and water absorption not more than 20% upto plinth level:		
7.9.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	448.00
7.9.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	435.00
7.10	Half brick thick brick masonry with modular well-burnt clay bricks of crushing strength not less than 25 kg/sqcm and water absorption not more than 20% upto plinth level:		
7.10.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	430.00
7.10.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	417.00
7.11	Half brick thick brick masonry with fly-ash lime bricks (FaLG Bricks) confirming to IS:12894-2002 of class designation 4.0 in superstructure above plinth level upto plinth level:		
7.11.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	394.00
7.11.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	382.00

Code No	Description	Unit	Rate Rs.
7.12	Extra for half brick work in superstructure above plinth level for every story or part thereof in addition to rate for upto plinth level:	sqm	11.00
7.13	Half brick thick honey comb brick work with modular well burnt clay bricks of crushing strength not less than 35 kg/sqcm and water absorption not more than 20% upto plinth level.		
7.13.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	337.00
7.13.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	329.00
7.14	Half brick thick honey comb brick work with modular well burnt clay bricks of crushing strength not less than 25 kg/sqcm and water absorption not more than 20% upto plinth level.		
7.14.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	325.00
7.14.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	317.00
7.15	Half brick thick honey comb brick work with fly-ash lime bricks (FaLG Bricks) confirming to IS:12894-2002 of class designation 4.0 upto plinth level.		
7.15.1	Cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	301.00
7.15.2	Cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	293.00
7.16	Extra for half brick thick honey comb brick work in superstructure above plinth level for every story or part thereof in addition to rate for upto plinth level:	sqm	12.00
7.17	Extra for cutting or chamfering of bricks to required shape in brick masonry work	metre	14.50
7.18	Providing 10cm. x 7.60 cm. drip course with specially moulded burnt bricks of crushing strength not less than 35 kg/sqcm and water absorption not more than 20% at junction of roof and walls in cement mortar 1:4 (1 cement 4 fine sand)	metre	69.00
7.19	Moulding and cornices with brick masonry using bricks of crushing strength not less than 35 kg/sqcm and water absorption not more than 20% in cement Mortar 1:4 (1 cement 4 coarse sand) including cement plaster 15 mm thick, 10 cm projected, 20 cm deep (40 cm Girth) in cement mortar 1:4 (1 cement : 4 fine sand) at any floor.	metre	252.00
7.20	Extra for providing and placing in position hopping 25x1.60 mm or 2 Nos 6mm dia MS bars reinforcement at every third course of half brick masonry.	sqm	62.50
7.21	Extra for laying brick work in/under water and/or liquid mud including cost of pumping or bailing out water and removing slush etc. complete.	cum	146.00
7.22	Extra for laying brick work in or under foul conditions.	cum	97.00*
7.23	Extra for brick work, where height of work exceeds 4.0 metre from immediate below floor level.	cum	94.50
7.24	Providing and laying precast cement concrete block in masonry work with precast blocks having crushing strength 75 kg/sqcm in cement mortar 1:6(1 Cement :6 coarse sand) .(To be used in boundary wall and plaster shall not be done.)	cum	4680.00

Code No	Description	Unit	Rate Rs.
7.25	Providing and laying AAC Autoclaved aerated concrete block confirming to IS: 2185 (Part-3)-1984) in block masonry with AAC blocks of width 100/ 200mm height 200/250/300mm, length 400/500/600 mm (approved sizes) with cement mortar 1 :6 (1 Cement :6 coarse sand) in superstructure. AAC blocks should have specific gravity 0.6 to 0.65 and crushing strength should not be less than 3 N/ sqmm (testing as per IS: 6441 - 1972).	cum	4541.00

Note * **These items are to be executed only with prior permission of Chief Engineer**

8.0 WOOD AND PVC WORK

A) TERMINOLOGY

(1) **Ballies :** Thin round poles usually without bark.

(2) **Beam :** A structural timber generally long in proportion to its width and thickness and used for supporting load primarily by its internal resistance to bending.

(3) **Block Board :** A Board having a core made up of strips of wood, each not exceeding 25 mm in width, laid separately or glued or otherwise joined to form a slab which is glued between two or more outer veneers with the direction of the grain of the core blocks running at right angles to that of the adjacent outer veneers.

(4) **Core :** The inner layers of a composite wood product.

(5) **Cross Band :** A general term indicating a transverse layer of veneer or veneers in composite wood products.

(6) **Decorative Veneers :** Veneers having attractive appearance due to figure, colour, grain, lustre, etc.

(7) **Hard Wood :** A conventional term used to denote the wood obtained from broad-leaved trees. It has no relationship to the physical properties of hardness or strength. On account of the confusion this word might cause, its use is discouraged.

(8) **Freeze Rail :** Horizontal member, mortised or other-wise 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.

(9) **Joint :** A prepared connection for joining adjacent pieces of wood, veneer, etc.

(10) **Dovetail Joint :** A joint at the corner of two pieces in such a way that the notches made to one are fitted exactly into projections of corresponding size and shape made in the other. There are various kinds of dovetail joints for instance, lapped dovetail joint, wedge shaped dovetail joint, etc. joined in a way which will resist withdrawal except in the direction in which it was assembled.

(11) **Mitred Joint :** A joint, between two members at an angle which bisects the joining angle usually the joining faces are cut at 45° to form a right angle **Mortise and Tenon Joint :** A joint in which the reduced end (tenon) of one member fits into the corresponding slot (mortise) in another member .

(12) **Tongue and Groove Joint :** A joint in which a tongue is provided on edge of one member to fit into a corresponding groove on the other.

(13) **Knot :** Base of a branch or limb embedded in the tree which becomes visible when it is cut.

(14) **Diameter of a Knot :** The maximum distance between two points farthest apart on the periphery of a round knot, on the face where it becomes visible. In the case of a spike or splay knot, the maximum width of the knot visible on the face on which it appears shall be taken as its diameter.

(15) **Muntin :** Small horizontal or vertical dividing bars within basic framework of a window, or door sub-dividing and supporting the glass panes or panels of doors.

(16) **Particle Board :** A board manufactured from particles of wood or other lignocelluloses 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.

(17) **Particle :** Distinct particle or fraction of wood, or other lignocelluloses 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.

(18) **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.

(19) **Rebate :** A recess along the edge of a piece of timber to receive another piece or a door, sash or a frame.

(20) **Sapwood :** The outer layers of the log, which in the growing tree contain living cells and feed material.

(21) The sapwood is usually lighter in colour, and is readily attacked by insects and fungi.

(22) **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.

(23) **Seasoned Timber :** Timber whose moisture content has been reduced to the specified minimum, under more or less controlled processes of drying.

(24) **Structural Timber :** Timber used in framing and load bearing structures or timber used or intended for use in buildings where strength is the primary consideration.

B) MATERIALS

The materials to be used should be as specified in items and shall have the following properties:

i) **Timber:** The timber shall be free from decay, fungal growth, boxed heart, pitch pockets or streaks on the exposed edges, splits and cracks. The timber shall be of best quality. The knots should be avoided over a specified limit.

ii) **Plywood Boards:** Plywood boards are formed by gluing and pressing three or more layers of veneers with the grains of adjacent veneers running at right angles to each other. The veneers shall be either rotary cut or sliced and shall be sufficiently smooth to permit an even spread of glue. Face veneers may be either commercial or decorative on both sides or one side commercial and the other decorative. Plywood shall be of BWP grade or BWR grade as per IS: 303.

iii) **Particle Boards:** Particle boards shall be of medium density and manufactured from particles of agro waste, wood or lignocelluloses i.e. material blended with adhesive and formed into solid panels under the influence of heat, moisture, pressure etc. The particle boards shall be flat pressed with single, three or multi layers and graded and of Type I as per Table 1 of IS: 3087. Both surfaces of the boards shall be sanded to obtain a smooth finish.

iv) **Veneered Particle Boards:** Veneered Particle Boards have a solid core of medium density Type I particle board which is covered with commercial or decorative veneers on both faces or with decorative veneers on one face and commercial veneers on the other. Face veneers are bonded

using adhesives under the influence of heat and pressure. Veneered particle board shall be of exterior grade (Grade I) as per IS : 3097. Both surfaces of the boards shall be sanded to a smooth finish.

v) Hard Board: Hard boards are generally classified into the following three types according to their method of manufacture, density and other related mechanical and physical properties.

(a) Medium hard board : A homogenous fibre building board having a density exceeding 480 kg/m^3 but not exceeding 800 kg/m^3.

(b) Normal hard board : A homogenous fibre building board having a density exceeding 800 kg/m^3 but not exceeding 1200 kg/m^3.

(c) Tempered hard board : Hard board which has been further treated in the course of manufacture to increase its density, strength and water resistance.

vi) Block Board: Block Boards have a solid core made up of uniform strips of wood each not exceeding 25 mm in width, laid separately, or spot glued, or otherwise joined to form a slab which is glued. Between two or more outer veneers, with the direction of the grain of the core block running at right angles to that of adjacent veneers. In any one block board, the core strips shall be of one species of timber only. Face veneers may be decorative or commercial on both faces or decorative on one face and commercial on the other. Block boards shall be Grade I (Exterior Grade) as per IS : 1659. Both surfaces of the boards shall be sanded to a smooth finish.

vii) Asbestos Cement Board: This should conform to IS : 2096-1966. The material used in the manufacture of asbestos cement building boards shall be composed of an inert aggregate consisting of clean asbestos fibre cemented together by ordinary portland cement, rapid hardening and low heat portland cement, or blast furnace slag cement. No organic or inorganic materials shall be added to the composition. Pigments which are embodied in the asbestos cement for colouring purpose shall be of permanent colours and shall conform to the requirements. The thickness of the asbestos cement board used for paneling shall not generally be less than 6.5 mm in case of single panels shutters and 5 mm in case of two or more panel shutter. Asbestos cement building boards shall be of two classes, namely class 'A' and class B. The thickness of class A shall be 6.5 mm and for class 'B' 5 mm. The tolerance on thickness shall be ± 0.5 mm.

viii) Fibre Boards: Fibre boards shall be of medium density and manufactured from wood fibre, produced by fiberizing steamed wood under pressure, blended with adhesive and wax and formed into solid panels under controlled conditions of heat and pressure. Fibre boards are flat pressed single layer and shall be Exterior Grade as per IS : 12406. Both surfaces of the boards shall be sanded to a smooth finish.

ix) Adhesive: Adhesive used for bonding BWP grade of plywood boards shall be BWP type synthetic resins conforming to IS : 848 respectively.

x) Sheet Glass: Sheet Glass shall be flat, transparent and clear as judged by the unaided eye. It may, however, possess a slight tint when viewed edgewise. Sheet glass shall be of selected Quality (SQ) or Ordinary Quality (OQ) as per IS : 2835. Glass shall be free from cracks. Unless otherwise specified, ordinary quality sheet glass shall be used.

xi) Wire Cloth (Wire Gauze): Wire Cloth which shall generally conform to IS : 1568-1970 shall be regularly woven with equally spaced galvanised mild steel wires in both warp and weft directions. The wire cloth shall be properly selvedged by one or more wires in each edge.

xii) Gypsum Board: Gypsum Board is formed by enclosing and bonding together a core gypsum plaster (a calcium sulphate mineral) with or without fibre between two sheets of highly durable paper. The gypsum boards shall be non-resonant, dimensionally stable and possesses flame retardant qualities. The boards shall conform to IS : 2095-1976 and gypsum plaster shall conform to IS : 2547-1976. The surfaces of the board shall be true and free from imperfection that would render the board unfit for use with or without decoration.

xiii) Fittings: All fittings and fixtures like hinges, aldrops, tower bolts, handles, nails, screws etc. shall be as per relevant IS specifications and of specified material as per item.

C) FABRICATION

(i) Frames: Timber for door, window and ventilators frames shall be as specified. Timber shall be sawn in the direction of the grains. All members of a frame shall be of the same species of timber and shall be straight without any warp or bow. Frames shall have smooth, well-planed (wrought) surfaces except the surfaces touching the walls, lintels, sill etc., which may be left clean sawn. Rebates, rounding or moulding shall be done before the members are jointed into frames. The depth of the rebate for housing the shutters shall be 15 mm, and the width of the rebates shall be equal to the thickness of the shutters. A tolerance of ± 3 mm and 2 mm shall be permitted in the specified finished dimensions of timber sections in frames.

(ii) Trusses: As per drawing, a full size truss diagram shall first be drawn on a leveled platform. From this full size diagram, templates of all joints as for tenons, mortises, scarves etc. shall be made for use in the fabrication. The template shall be made to correspond to each member and plate holes for screws and bolts shall be marked accurately on them and drilled. The templates shall be laid on wooden members and the holes for screwing and bolting marked on them. The ends of the wooden members shall also be marked for cutting. The base of columns and the position of anchor bolts shall be carefully set out. Before fabrication of the truss individual members shall be assembled together to ensure close abutting or lapping of the surfaces of the different members and fitted close together as per drawing.

(iii) Frame Work: Timber for stiles and rails shall be of the same species and shall be sawn in the directions of grains. Sawing shall be truly straight and square. The timber shall be planed smooth and accurate to the required dimensions. The stiles and rails shall be joined to each other by plain or haunched mortise and tenon joints and the rails shall be inserted 25 mm short of the width of the stiles. The bottom rails shall have double tenon joints and for other rails single tenon joints shall be provided. The lock rails of door shutter shall have its centre line at a height of 800 mm from the bottom of the shutters unless otherwise specified. The thickness of each tenon shall be approximately one-third the finished thickness of the members and the width of each tenon shall not exceed three times its thickness.

(iv) Paneling: The panel inserts shall be either framed into the grooves or housed in the rebate of stiles and rails. Timber, plywood, hard board and particle board panels shall be fixed only with grooves. The depth of the groove shall be 12 mm and its width shall accommodate the panel inserts such that the faces are closely fitted to the sides of the groove. Panel inserts shall be framed into the grooves of stiles and rails to the full depth of the groove leaving on space of 1.5 mm. Width and depth of the rebate shall be equal to half the thickness of stiles and rails. Glass panels, asbestos panels wire gauze panels and panel inserts of cupboard shutters shall be housed in the rebates of stiles and rails.

(v) Flush door shutters: Flush door shutters shall have a solid core and may be of the decorative or non-decorative (Paintable type as per IS : 2202 (Part I). Nominal thickness of shutters may be 25, 30 or 35 mm. Thickness and type of shutters shall be as specified.

(vi) Louvered shutters: Specified timber shall be used, and it shall be sawn in the direction of the grains. Sawing shall be truly straight and square. The timber shall be planed smooth and accurate to the full dimensions, rebates, roundings and moulding as shown in the drawings made, before assembly. Patching or plugging of any kind shall not be permitted except as provided. Width and height of the shutters shall be as shown in the drawings or as indicated by the Engineer-in-Charge. All four edges of the shutters shall be square. The shutter shall be free from twist or warp in its plane. The moisture content in timbers used in the manufacture of flush door shutters shall be not more than 12 percent when tested according to IS: 1708-1986.

SCHEDULE OF FITTING FOR DOORS AND WINDOWS

S. No	Name of Fittings	Double leaf doors shutters paneled or glazed	Single leaf door shutters external paneled or glazed	Single leaf door shutters inter communicating paneled or glazed	Single leaf wire guaze door shutters	Single leaf wardrobe/ cupboard shutters	Single leaf window shutters paneled or glazed	Fan light/ clear storey window shutters	Designation no. of wood screw	Length in mm of wood screws IS 6760	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
1	Butt Hinges 5100 mm	6	3	3	3	-	-	-	9	40	
2	Butt Hinges 75 mm	-	-	-	-	-	2	2	8	20	
3	Butt Hinges 50 mm	-	-	-	-	1	1	-	6	20	For fixing wooden cleat
4	Piano Hinges	-	-	-	-	-	-	-	6	20	
5	Tower Bolt 250 mm	3	2	3	2	-	1	-	10	30	
6	Tower Bolt 150 mm	-	-	-	-	-	1	-	8	30	
7	Tower Bolt 100 mm	-	-	-	-	-	-	-	6	30	
8	Sliding door Bolt 300 mm	1	-	-	-	-	-	-	9	35	
9	Sliding door Bolt 250 mm	-	1	-	-	-	-	-	9	35	
10	Floor door stopper	2	1	1	-	1	-	-	9	30	
11	Door handle with plate 100 mm	2	2	2	1	-	-	-	6	25	
12	Window handle with plate 75 mm	-	-	-	-	-	1	-	6	20	
13	Casement stay 300 mm	-	-	-	-	-	1	-	6	30	
14	Helical door spring (Superior quality)	-	-	-	1	-	-	-	6	30	
15	Cupboard /Wardrobe Lock	-	-	-	1	1	-	-	6	20	
16	Fanlight Catch	-	-	-	-	-	-	1	8	30	

Notes :

A : Door Shutters

1. Door of room adjoining the verandah, corridor, lobby or hall, shall be considered as external door.
2. Where the height of the door leaf exceeds 2.15 metres above the floor level, one extra hinge shall be provided for every additional height of 0.50 metre, or part thereof and the length of top bolts shall be increased by the height of the leaf above 2.15 metres from floor level.
3. Single leaf door shutters of more than 0.80 m in width shall be provided with one extra hinge.

4. Fan light shutters of more than 0.80 metre width shall be provided with one extra hinge and extra quadrant stay.
5. In double leaf shutters of doors, two door bolts shall be fixed to the first shutter and one to the closing shutter at the top.
6. In case of single leaf inter communicating, paneled, glazed or paneled door shutter for bath and w.c. one tower bolts will be replaced by a bathroom latch.
7. For shutter exceeding 40 mm thickness, heavy type M.S. butt hinges of 125 x 90 x 4 mm shall be used.
8. In case of external door shutters, instead of sliding door ball mortice lock can be provided where specified.
9. Cupboard and wardrobe shutters will have ball catches where specified.
10. Finger plates shall be provided in case of bath and wc shutters in office buildings.

B : Window Shutters

11. In case of windows with double shutters, two tower bolts shall be fixed to the closing shutters and one tower bolt to the first shutter at the top.
12. In case of window shutters, hooks and eyes may be provided in lieu of casement stays where specified.
13. Where the height of window shutter exceeds 1.20 metres one extra hinge shall be provided and length of top bolts shall be increased by height of the leaf above 2.15 metres from the floor level.
14. Window shutter with steel frames shall be provided with six hinges in case of double leaf shutters and three hinges in case of single leaf shutters, irrespective of height and width of shutters.

C : Fanlight and Clerestory Window or Ventilator

15. Centrally hung and bottom hung CS windows and fan lights, will be provided with chain and hook bamboo pole with hook for opening ventilators shall be provided for each residence or for set of 4 rooms in case of office building.
16. Centrally hung clerestory windows or fan lights will have fan light pivots in lieu of hinges.

Dimensions and Tolerances of Components of Door Shutters

S. No	Description	Width mm	Thickness mm
(a)	Vertical Stile, top and freeze rail	100 ± 3	30 ± 1 or 35 ± 1 or 40 ± 1
(b)	Lock rail	50 ± 3	30 ± 1 or 35 ± 1 or 40 ± 1
(c)	Bottom rail	200 ± 3	30 ± 1 or 35 ± 1 or 40 ± 1
(d)	Muntin	100 ± 3	30 ± 1 or 35 ± 1 or 40 ± 1
(e)	Glazing bar	40 ± 3	30 ± 1 or 35 ± 1 or 40 ± 1

Dimensions and Tolerances of Components of Window and Ventilator Shutters

S. No	Description	Window Shutters		Ventilator Shutters	
		Width mm	Thickness mm	Width mm	Thickness mm
(a)	Stiles and rails	80 ± 3	25 ± 1 or 30 ± 1	80 ± 3	20 ± 1 or 22.5 ± 1 or 25 ± 1 or 27.5 ± 1 or 30 ± 1
(b)	Munting	60 ± 3	25 ± 1 or 30 ± 1	60 ± 3	--do--
(c)	Glazing bar	40 ± 3	25 ± 1 or 30 ± 1	40 ± 3	--do--

D) JOINTS:

Joints shall be simple, neat and strong. All mortise and tenon joints, mitred joints, scarfs etc. shall fit in fully and accurately without wedging or fillings. The joints shall be as per detailed drawings. Holes of correct sizes shall be drilled before inserting screws/bolts. Driving in screws with hammer is prohibited. Holes for bolts shall be of uniform diameter. The screws, bolts and nails shall be dipped in oil before using. The heads of nails and screws shall be sunk and puttied or dealt with as instructed by Engineer-in-Charge. The gauge and Length of nails, screws and bolts shall be approved by the Engineer-in-Charge before using on works.

The contact surfaces of all type of joints shall be treated, before putting together, with bulk type synthetic resin adhesive conforming to IS: 851-1978 suitable for construction in wood or synthetic resin adhesive (Phenolic and aminoplastic) to IS: 848- 1974 or polyvinyl acetate dispersion based adhesive conforming to IS: 4835-1979 and pinned with 10 mm hard wood dowels or bamboo pins or star shaped metal pins, after the frames are put together & pressed in position by means of press.

E) MEASUREMENTS:

(i) All types of wood work shall be measured for finished dimensions, without allowance for the wastage. However, in case of members having mouldings, roundings or rebates and members of circular or varying section, finished dimensions shall be taken as the sides of the smallest square or rectangle from which such a section can be cut.

(ii) The length and breadth shall measured correct to centimetre and thickness shall be measured correct to millimetre, where the unit of measurement is cubic metre. The quantity shall be calculated in cubic metre correct to two places of decimal.

(iii) The length and breadth shall measured correct to centimetre where the unit of measurement is square metre. The quantity shall be calculated in square metre correct to two places of decimal.

(iv) The length shall be measured correct to centimetre where the unit of measurement is running metre

(v) The all type of fittings shall be counted in number where the unit of measurement is each.

F) RATE

The rate of wood work includes cost of all material, labour, hardware, T&P, wastages and hire & running charges of machinery etc. and also includes cost of erecting & fixing in position at all levels, leads and lifts.

G) USE OF TEAK WOOD: **Use of teak wood in the estimates and works shall be with prior approval of Chief Engineer.**

8.0 WOOD AND PVC WORK

Code No	Description	Unit	Rate Rs.
8.1	Providing wood work in frames of doors, windows, clerestory windows and other frames wrought framed and fixed in position.		
8.1.1	Teak wood	cum	114758.00*
8.1.2	Sal, bijasal, benteak, khair, haldu	cum	61051.00
8.2	Providing wood work in frames of false ceiling, partition etc. sawn and put in position with main batten 125x50mm (nominal) and cross batten 50x38mm (nominal) both at spacing of 600mm center to center.		
8.2.1	Teak wood	cum	119052.00*
8.2.2	Sal, bijasal, benteak, khair, haldu	cum	62544.00

Code No	Description	Unit	Rate Rs.
8.3	Providing 40x5mm iron hold fast 40cm long including fixing to frame with 10mm bolts nuts and wooden plug and embedding in Cement Concrete 1:2:4 in blocks of size 30x10x15cm.	each	72.50
8.4	Providing and fixing Dash fastener (for fixing door/ window frames) on C.C. / R.C.C./ Brick masonry surface backing including drilling necessary holes and the cost of bolt etc complete.		
8.4.1	Dash fastener 6x75mm	each	20.50
8.4.2	Dash fastener 10x75mm	each	27.50
8.4.3	Dash fastener 12x100mm	each	39.00
8.5	Extra for additional labour for circular work such as frames of fan lights.		
8.5.1	Teak wood	cum	12199.00*
8.5.2	Sal, bijasal, benteak, khair, haldu	cum	6828.00
8.6	Providing and fixing 40mm thick paneled or glazed or paneled and glazed shutter frames for doors excluding hinges and paneling. (Area of shutter to be measured without deducting paneling area)		
8.6.1	Teak wood	sqm	2906.00*
8.6.2	Bijasal, benteak, khair, haldu	sqm	1768.00
8.7	Providing and fixing 35mm thick paneled or glazed or paneled and glazed shutter frames for doors excluding hinges and paneling. (Area of shutter to be measured without deducting paneling area)		
8.7.1	Teak wood	sqm	2620.00
8.7.2	Bijasal, benteak, khair, haldu	sqm	1605.00
8.8	Providing and fixing 30mm thick paneled or glazed or paneled and glazed shutter frames for doors excluding hinges and paneling. (Area of shutter to be measured without deducting paneling area)		
8.8.1	Teak wood	sqm	2256.00
8.8.2	Bijasal, benteak, khair, haldu	sqm	1397.00
8.9	Providing and fixing 35mm thick glazed shutter frames for windows, clerestory windows, ventilators etc. using glass panes including M.S. butt hinges with necessary screws but excluding glass panes. (Area of shutter to be measured without deducting paneling area).		
8.9.1	Teak wood	sqm	3017.00*
8.9.2	Bijasal, benteak, khair, haldu wood.	sqm	1885.00
8.10	Providing and fixing 30mm thick glazed shutter frames for windows, clerestory windows, ventilators etc. using glass panes including M.S. butt hinges with necessary screws but excluding glass panes. (Area of shutter to be measured without deducting paneling area).		
8.10.1	Teak wood	sqm	2653.00
8.10.2	Bijasal, benteak, khair, haldu wood.	sqm	1677.00

Code No	Description	Unit	Rate Rs.
8.11	Providing and fixing glass panes in glazed or paneled and glazed shutters of doors and window, clearstory windows etc (Only area of glass panes to be measured).		
8.11.1	4mm thick	sqm	415.00
8.11.2	5mm thick	sqm	502.00
8.11.3	6mm thick	sqm	589.00
8.11.4	8mm thick	sqm	814.00
8.12	Providing and fixing flush door shutters, conforming to IS : 2202 (Part-I), decorative type core of block board construction with frame of first class hard wood and well matched teak ply veneering with vertical grains or cross bands and face veneers on both faces of shutters excluding hinges.		
8.12.1	40 mm. thick (single leaf)	sqm	2467.00
8.12.2	35 mm. thick (single leaf)	sqm	2005.00
8.12.3	30 mm. thick (single leaf)	sqm	1832.00
8.12.4	25 mm. thick (single leaf)	sqm	1659.00
8.12.5	25 mm. thick (double leaf for cupboard shutters with piano type hinges	sqm	1669.00
8.13	Providing and fixing flush door shutters, conforming to IS 2202 (Part 1), interior grade, commercial type, core of block board construction with frame of first class hard wood and well matched commercial ply veneering with vertical grains, cross bands and face veneers on both faces of shutters excluding hinges.		
8.13.1	40 mm. thick (single leaf)	sqm	1601.00
8.13.2	35 mm. thick (single leaf)	sqm	1370.00
8.13.3	30 mm. thick (single leaf)	sqm	1197.00
8.13.4	25 mm. thick (single leaf)	sqm	1081.00
8.13.5	25 mm. thick (double leaf for cupboard shutters with piano type hinges	sqm	1092.00
8.14	Providing and fixing flush door shutters, core of block board construction with frame of first class hard wood and well matched first class Indian teak ply veneering on one face and commercial ply veneering on the other face of the shutter with vertical grains, cross bands and face veneering excluding hinges.		
8.14.1	40 mm. thick (single leaf)	sqm	2034.00
8.14.2	35 mm. thick (single leaf)	sqm	1688.00
8.14.3	30 mm. thick (single leaf)	sqm	1514.00
8.14.4	25 mm. thick (single leaf)	sqm	1370.00
8.14.5	25 mm. thick (double leaf for cupboard shutters with piano type hinges	sqm	1380.00
8.15	Extra for double leaf shutter instead of single leaf.	sqm	52.00
8.16	Providing and fixing PVC membrane foil coated (laminated) flush door shutters, made with core of block board with frame of first class hard		

Code No	Description	Unit	Rate Rs.
	wood, coated with 0.30mm membrane pasted with resin using vacuam treatment process complete all but excluding hinges.		
8.16.1	35 mm thick (single leaf)	sqm	1982.00
8.16.2	30 mm thick (single leaf)	sqm	1768.00
8.17	Providing and fixing PVC membrane foil coated (laminated) flush door shutters, made of partical board coated with 0.30mm membrane pasted with resin using vacuum treatment process complete all but excluding hinges.		
8.17.1	35 mm thick (single leaf)	sqm	1578.00
8.17.2	30 mm thick (single leaf)	sqm	1370.00
8.18	Providing and fixing lipping with second class teak wood lipping on all edges of shutters.		
8.18.1	25 x 6 mm size	metre	42.00
8.18.2	30 x 6 mm size	metre	48.50
8.18.3	35 x 6 mm size	metre	54.50
8.18.4	40 x 6 mm size	Metre	61.50
8.19	Extra for providing vision panel not exceeding 0.10 sqm in all type of flush shutters (excluding cost of glass)		
8.19.1	Rectangular or square	each	69.00
8.19.2	Circular	each	91.50
8.20	Extra for providing louvers in flush doors upto 0.20 sqm		
8.20.1	Decorative type doors (50 x 5 mm)	sqm	191.00
8.21	Extra for cutting rebate in flush door shutter (total area of door shutter to be measured).	sqm	46.00
8.22	Providing and fixing paneling in paneled or paneled and glazed shutters for doors etc. (only area of paneling to be measured). Paneling for or paneled and glazed shutters 25 mm to 40 mm thick:		
8.22.1	Teak wood (16mm thick panel)	sqm	1842.00*
8.22.2	Bijsal, Haldu, Benteak, Khair (16mm thick panel)	sqm	1167.00
8.22.3	12 mm thick pre-laminated particle board with one side decorative and other side balancing lamination, flat pressed 3 layer & graded (medium density) Grade I, Type II conforming to IS : 12823 (exterior grade).	sqm	1126.00
8.22.4	12 mm thick pre-laminated particle board with both side decorative lamination, flat pressed 3 layer & graded (medium density) Grade I, Type II conforming to IS : 12823 (exterior grade).	sqm	1172.00
8.22.5	12mm thick pre-laminated particle board flat pressed with decorative lamination on one side and balancing lamination on other side exterior Grade - I MDF Board 12 mm thick confirming to IS:14587,	sqm	1012.00

Code No	Description	Unit	Rate Rs.
8.22.6	12mm thick pre-laminated particle board flat pressed with decorative lamination on both sides exterior Grade - I MDF Board 12 mm thick confirming to IS:14587.	sqm	1070.00
8.22.7	12 mm thick ply teak veneering on both faces	sqm	1813.00
8.22.8	12 mm thick solid PVC sheet with decorative lamination one side and other side balancing lamination of approved quality and make	sqm	964.00
8.22.9	12 mm thick solid PVC sheet with decorative lamination on both sides of approved quality and make	sqm	1022.00
8.23	Providing and fixing 35mm thick wire gauge shutter having top and style rail 95mm width, bottom and lock rail 197mm width, using galvanized M.S. wire dia of 0.45 mm for doors, windows, clerestory windows excluding hinges.		
8.23.1	Teak Wood	sqm	2891.00*
8.23.2	Bijasal, Haldu, Benteak, Khair	sqm	1888.00
8.24	Providing and fixing 30mm thick wire gauge shutter having top and style rail 95mm width, bottom and lock rail 197mm width, using galvanized M.S. wire dia of 0.45mm for doors, windows, clerestory windows excluding hinges.		
8.24.1	Teak Wood	sqm	2477.00*
8.24.2	Bijasal, Haldu, Benteak, Khair	sqm	1722.00
8.25	Extra for providing fixing galvanized M.S. wire dia of 0.60 mm instead of wire dia 0.45mm to doors, windows and clerestory windows.	sqm	18.00
8.26	Providing and fixing 40mm thick louvered shutters fixed with venetians 12mm thick for window excluding hinges.		
8.26.1	Teak Wood	sqm	3735.00*
8.26.2	Bijasal, Haldu, Benteak, Khair	sqm	2425.00
8.27	Providing and fixing louvers 50mm wide and 12 mm thick in grooves in clerestory window frames excluding cost of frame.		
8.27.1	Teak Wood	sqm	1798.00*
8.27.2	Bijasal, Haldu, Benteak, Khair	sqm	1139.00
8.28	Providing and fixing plain jafri of 35x10mm laths placed 35mm apart (frame to be paid separately) including M.S. straps, fixing 50x12mm beading complete.		
8.28.1	Teak Wood	sqm	1748.00*
8.28.2	Bijasal, Haldu, Benteak, Khair	sqm	1135.00
8.29	Providing and fixing plain jaffri door, windows shutters excluding, 35x10mm laths placed 35 mm apart including fixing 50x12 mm beading complete excluding hinges with.		
8.29.1	Teak Wood	sqm	2768.00*
8.29.2	Bijasal, Haldu, Benteak, Khair	sqm	1780.00

Code No	Description	Unit	Rate Rs.
8.30	Providing 50x50x50mm thick wood plugs including cutting brick work and fixing in Cm 1:3 (1 cement :3 sand).	each	20.50
8.31	Providing and fixing teak wood plain lining tongue and groove and including wooden/ rawl plugs complete with necessary screws and priming coat on exposed surface.		
8.31.1	38 mm thick	sqm	5076.00
8.31.2	25 mm thick	sqm	3243.00
8.31.3	19 mm thick	sqm	2634.00
8.32	Providing and fixing in wall lining 12mm thick flat pressed three layer (medium density) particle board pre-laminated one side decorative lamination on other side balancing lamination exterior Grade - I MDF Board 12 mm thick confirming to IS:14587 marked including priming coat on unexposed surface, with necessary fixing arrangement and screws etc. complete.	sqm	973.00
8.33	Providing and fixing teak wood jamb lining with necessary screws, priming coat on exposed surfaces etc complete. (only jamb lining area is to be measured)		
8.33.1	40 mm thick	sqm	5712.00
8.33.2	25 mm thick	sqm	3962.00
8.34	Providing and fixing 4mm thick ply wood plain lining with necessary screws and primary coat on exposed surface complete with ply facing.		
8.34.1	Teak ply faces	sqm	963.00
8.34.2	Commercial ply faces.	sqm	600.00
8.35	Providing and fixing wall paneling frame made of commercial grade 12mm thick water proof ply strips 100mm wide at 600mm apart center to center vertically and horizontally with necessary screws, wooden plugs etc complete as required.	sqm	552.00
8.36	Providing and fixing commercial grade water proof ply for wall paneling on wooden frame with necessary nails complete as required.		
8.36.1	19mm	sqm	1231.00
8.36.2	12mm	sqm	827.00
8.36.3	6mm	sqm	548.00
8.37	Providing and fixing approved shade veneering on wood wall paneling complete as required.	sqm	705.00
8.38	Providing and fixing 25mm thick teak wood plain skirting with necessary screws and a priming coat with wood primer on unexposed surfaces.	sqm	3583.00
8.39	Providing and fixing teak wood moulded beading to doors windows frames including necessary screws and primary coat on exposed surface.		
8.39.1	19x12mm	metre	50.50
8.39.2	25x12 mm	metre	81.00

Code No	Description	Unit	Rate Rs.
8.39.3	25x25mm	metre	122.00
8.39.4	50x12mm	metre	122.00
8.39.5	50x19mm	metre	167.00
8.40	Providing and fixing 200 mm wide teak wood moulding such as base moulding, chair rail, architrave, moulded posts moulding skirting including necessary screws and painting on unexposed surfaces with wood primer etc complete for per cm thick.	metre	224.00
8.41	Providing and fixing teak wood archivolt having 100 mm projectors including necessary screws and painting of unexposed surfaces with approved wood primer etc complete for per cm width.	metre	138.00
8.42	Providing and fixing 12mm thick, 100mm wide pelmet with 6mm thick top cover, 20mm dia nickel plated M.S. pipe heavy duty curtain rod and bracket including fixing with 10cm long 25x3mm M.S. flat, rawl plugs, screws etc complete.		
8.42.1	Teak wood	metre	391.00*
8.42.2	12 mm thick ply board, commercial veneering both face.	metre	271.00
8.42.3	12 mm thick ply board, commercial veneering on one face and teak veneering on other face.	metre	348.00
8.43	Providing and fixing 12mm thick, 150mm wide pelmet with 6mm thick top cover, 20mm dia nickel plated M.S. pipe (heavy duty) curtain rod and bracket including fixing with 10cm long 25x3mm M.S. flat, rawl plugs etc complete.		
8.43.1	Teak wood	metre	461.00*
8.43.2	12 mm thick ply board, commercial veneering both face.	metre	342.00
8.43.3	12 mm thick ply board, commercial veneering on one face and teak veneering on other face.	metre	460.00
8.44	Extra for providing and fixing heavy duty stainless steel pipe for curtain rod with two stainless steel brackets in pelmets instead of M.S. curtain rod of 20mm dia and M.S. brackets. (actual length of rod to be measured)		
8.44.1	12 mm dia	metre	98.50
8.44.2	19/20 mm dia	metre	190.00
8.44.3	25 mm dia	metre	229.00
8.45	Providing and fixing heavy duty stainless steel pipe for curtain/ cloth hanging with two stainless steel brackets in wooden pelmet or wardrobe or any other space including screws and or plastic rawl plugs etc. wherever necessary.		
8.45.1	With 20 mm dia pipe	metre	165.00
8.45.2	With 25 mm dia pipe	metre	190.00
8.45.3	Elliptical pipe made from 25mm dia pipe	metre	229.00

Code No	Description	Unit	Rate Rs.
8.46	Providing and fixing decorative curtain rod assembly made of 32mm dia aluminium pipe covered with decorative finish plastic sleeve, 2 Nos or more 100x50x20mm size decorative wooden bracket, 2 Nos 100x50mm dia decorative wooden rod holding end plugs and 50mm dia wooden curtain rings 1 nos for every 100mm of length of curtain rod including PVC rawl plugs etc complete:	metre	263.00
8.47	Providing and fixing Indian teak plywood 4 mm thick in partition including fixing to frames with brass screws etc. complete with 50x12mm teak wood beadings (frames to be paid separately).	sqm	943.00
8.48	Providing and fixing plain asbestos cement sheet 6 mm thick in partition including fixing to frames with necessary screws etc. complete with 50x12mm teak wood beadings (frames to be paid separately).	sqm	562.00
8.49	Providing and fixing 4 mm thick Decorative plywood of approved quality in partition including fixing to frames with necessary screws etc. complete with 50 x 12 mm teak wood beadings (frames to be paid separately).	sqm	1284.00
8.50	Providing and fixing 25 mm thick wooden shelves supported on 40x40x6 mm T or L iron brackets fixed at suitable distance in 75x75x150mm blocks of M-15 grade cement concrete.		
8.50.1	Teak wood	sqm	3590.00*
8.50.2	Bijasal, Haldu, Benteak, Khair	sqm	2395.00
8.51	Providing and fixing 38 mm thick wooden shelves supported on 40x40x6 mm T or L in brackets fixed at suitable distance in 75x75x150mm blocks of cement concrete 1:2:4:		
8.51.1	Teak wood	sqm	4571.00*
8.51.2	Bijasal, Haldu, Benteak, Khair	sqm	2955.00
8.52	Providing, and fixing M.S. round and square bars with MS flat of required pattern in wooden frames for windows & clerestory windows including applying a priming coat of red oxide zinc chromate primer, welding etc complete		
8.52.1	Plain grill	kg	68.00
8.52.2	Ornamental grill	kg	76.00
8.53	Providing and fixing expanded metal 20x60 mm stands 3.25 mm wide and 1.60mm thick to window including 62x19mm beading to teak wood including priming coat of red oxide zinc chromate primer.	sqm	929.00
8.54	Providing & fixing hard drawn steel wire fabric 75x25mm mesh of weight not less than 7.75 kg. per sqm to doors, window frames including 62x19mm teak wooden beading including priming coat of red oxide zinc chromate primer.	sqm	1069.00
8.55	Providing and fixing and galvanized wire mesh of I.S. gauge designation 85 G. with wires 0.56 mm dia to windows and clerestory windows including 19x12mm teak wood beading including priming coat of red oxide zinc chromate primer.	sqm	443.00

Code No	Description	Unit	Rate Rs.
8.56	Providing and fixing stainless steel wire mesh of average width of aperture 1.56mm with wire of dia 0.45mm to doors, windows and clerestory windows including 19x12mm teak wood beading etc. complete.	sqm	649.00
8.57	Providing sal wood beams, joints (karries) including hosting fixing in position and applying wood preservative on exposed surface etc. with Salwood.	cum	60013.00
8.58	Providing and fixing bright finished brass butt hinges with brass polished MS screws complete:		
8.58.1	125x85x5.50 mm (Heavy Type)	each	245.00
8.58.2	100x85x5.50 mm (Heavy Type)	each	195.00
8.58.3	75x65x4.00 mm (Heavy Type)	each	75.50
8.58.4	125x70x4.00 mm (Ordinary Type)	each	153.00
8.58.5	100x70x4.00 mm (Ordinary Type)	each	122.00
8.58.6	75x40x2.50 mm (Ordinary Type)	each	88.50
8.58.7	50x40x2.50 mm (Ordinary Type)	each	57.00
8.59	Providing and fixing bright finished brass parliamentary hinges with brass polished MS screws complete:		
8.59.1	150x125x27x5 mm	each	423.00
8.59.2	125x125x27x5 mm	each	352.00
8.59.3	100x125x27x5 mm	each	286.00
8.59.4	75x100x20x3.20 mm	each	109.00
8.60	Providing and fixing bright finished brass sliding door bolt with nuts and brass polished MS screws complete:		
8.60.1	300x16mm	each	475.00
8.60.2	250x16mm	each	344.00
8.61	Providing and fixing brass door latch with brass polished MS screws complete:		
8.61.1	300x16x5 mm	each	398.00
8.61.2	250x16x5 mm	each	268.00
8.62	Providing and fixing bright finished brass tower bolts (barrel type) with brass polished MS screws complete:		
8.62.1	250x10mm	each	276.00
8.62.2	200x10mm	each	231.00
8.62.3	150x10mm	each	176.00
8.62.4	100x10mm	each	119.00
8.63	Providing and fixing bright finished brass flush bolt with brass polished MS screws complete:		

Code No	Description	Unit	Rate Rs.
8.63.1	250 mm	each	269.00
8.63.2	150 mm	each	165.00
8.63.3	100 mm	each	112.00
8.64	Providing and fixing bright finished brass indicating bolt (vacant/ engaged) with brass polished MS screws complete:	each	174.00
8.65	Providing and fixing bright finished brass door handles with brass polished MS screws complete:		
8.65.1	125 mm	each	55.50
8.65.2	100 mm	each	49.00
8.65.3	75 mm	each	42.50
8.66	Providing and fixing bright finished brass furniture handles 50 mm with brass screws/nuts etc complete.	each	53.00
8.67	Providing and fixing of bright finished brass mortise latch and lock 100x65mm with six levers and a pair of lever handles with brass polished MS screws etc. complete.	each	971.00
8.68	Providing and fixing of bright finished brass mortise latch 100X65mm and pair of lever handles with brass polished MS screws etc. complete.	each	872.00
8.69	Providing and fixing bright finished brass rim latch and lock 100mm and pair of knob with brass polished MS screws etc. Complete	each	451.00
8.70	Providing and fixing bright finished brass 100mm rim latch with a dead bolt and a pair of knobs, brass polished MS screws etc. complete.	each	424.00
8.71	Providing and fixing special quality bright finished brass cupboard or wardrobe locks with four levers including necessary screws etc. complete (best make of approved quality) :		
8.71.1	40 mm	each	104.00
8.71.2	50 mm	each	113.00
8.71.3	65 mm	each	129.00
8.71.4	75 mm	each	148.00
8.72	Providing and fixing 50mm bright finished brass cupboard or ward robe knob with brass screws.	each	31.00
8.73	Providing and fixing 150mm bright finished brass floor door stopper with rubber cushion & brass polished MS screws etc complete to suit the shutter thickness.	each	73.00
8.74	Providing and fixing bright finished brass hard drawn hooks & eyes with brass polished MS screws etc complete.		
8.74.1	300 mm	each	84.00
8.74.2	250 mm	each	77.50
8.74.3	200 mm	each	64.00
8.74.4	150 mm	each	51.00

Code No	Description	Unit	Rate Rs.
8.74.5	100 mm	each	36.00
8.75	Providing and fixing bright finished brass hasp and staple (safety type) with brass polished MS screws complete		
8.75.1	150 mm	each	83.00
8.75.2	115 mm	each	56.50
8.75.3	90 mm	each	43.50
8.76	Providing and fixing bright finished brass hanging door stopper with necessary brass finished MS steel screws complete.	each	44.00
8.77	Providing and fixing antique/ SS finished brass butt hinges with antique/ SS polished MS screw complete:		
8.77.1	125x85x5.50mm (Heavy Type)	each	256.00
8.77.2	100x85x5.50 mm (Heavy Type)	each	205.00
8.77.3	75x65x4.00 mm (Heavy Type)	each	93.00
8.77.4	125x70x4.00mm (Ordinary Type)	each	158.00
8.77.5	100x70x4.00 mm (Ordinary Type)	each	126.00
8.77.6	75x40x2.50 mm (Ordinary Type)	each	79.50
8.77.7	50x40x2.50 mm (Ordinary Type)	each	64.00
8.78	Providing and fixing antique/ SS finished brass parliamentary hinges with antique/ SS polished MS screw complete:		
8.78.1	150x125x27x5 mm	each	442.00
8.78.2	125x125x27x5 mm	each	368.00
8.78.3	100x125x27x5 mm	each	300.00
8.78.4	75x100x20x3.20 mm	each	114.00
8.79	Providing and fixing antique/ SS finished brass sliding door bolt with necessary bolts, nuts and antique/ SS polished MS screw complete:		
8.79.1	300x16mm	each	496.00
8.79.2	250 x 16mm	each	489.00
8.80	Providing and fixing antique/ SS finished brass door latch with antique/ SS polished MS screw complete:		
8.80.1	300 x16x5 mm	each	424.00
8.80.2	250x16x5 mm	each	280.00
8.81	Providing and fixing antique/ SS finished brass tower bolts (Barrel type) with antique/ SS polished MS screw complete:		
8.81.1	250 x10 mm	each	297.00
8.81.2	200 x10mm	each	249.00
8.81.3	150 x 10 mm	each	189.00

Code No	Description	Unit	Rate Rs.
8.81.4	100 x10 mm	each	127.00
8.82	Providing and fixing antique/ SS finished brass flush bolts with antique/ SS polished MS screw complete:		
8.82.1	250 mm	each	282.00
8.82.2	150 mm	each	173.00
8.82.3	100 mm	each	119.00
8.83	Providing and fixing antique/ SS finished brass indicating bolt (Vacant/ engaged) with antique/ SS polished MS screw complete:	each	180.00
8.84	Providing and fixing antique/ SS finished brass handles with antique/ SS polished MS screw complete:		
8.84.1	125 mm	each	58.50
8.84.2	100 mm	each	52.00
8.84.3	75 mm	each	31.00
8.85	Providing and fixing antique/ SS finished brass furniture handles 50 mm with antique/ SS polished MS screws/nuts etc complete.	each	52.00
8.86	Providing and fixing 100mm antique/ SS finished brass mortise latch and lock with six levers and a pair of lever handles with antique/ SS polished MS screw complete.	each	1016.00
8.87	Providing and fixing antique/ SS finished brass 100mm mortise latch with one dead bolt and pair of lever handles with antique/ SS polished MS screw complete.	each	913.00
8.88	Providing and fixing 100 mm antique/ SS finished brass rim latch and lock with a pair of knobs with antique/ SS polished MS screw complete.	each	469.00
8.89	Providing & fixing 100mm antique/ SS finished brass rim latch with a dead bolt and pair of knobs with antique/ SS polished MS screw complete.	each	443.00
8.90	Providing & fixing 150mm antique/ SS finished brass floor door stopper with rubber cushion and antique/ SS polished MS screw complete to suit the shutter thickness.	each	77.00
8.91	Providing and fixing antique/ SS finished brass hard drawn hooks and eyes with antique/ SS polished MS screw complete:		
8.91.1	300 mm	each	87.50
8.91.2	250 mm	each	81.00
8.91.3	200 mm	each	66.50
8.91.4	150 mm	each	53.50
8.91.5	100 mm	each	39.50
8.92	Providing and fixing antique/ SS finished brass hasp and staple (safety type) with antique/ SS polished MS screw complete:		
8.92.1	150 mm	each	87.00
8.92.2	115 mm	each	59.00

Code No	Description	Unit	Rate Rs.
8.92.3	90 mm	each	46.00
8.93	Providing and fixing antique/ SS finished brass hanging door stopper with necessary antique/ SS finished MS steel screws complete.	each	49.50
8.94	Providing and fixing M.S. bright finished or black enameled Butt hinges IS : 1341 marked with necessary iron screws:		
8.94.1	125x65x2.12mm	each	30.00
8.94.2	100x58x1.90 mm	each	20.50
8.94.3	75x47x1.70 mm	each	14.00
8.94.4	50x37x1.50 mm	each	9.40
8.95	Providing and fixing M.S. bright finished or black enameled Parliamentary hinges with necessary iron screws:		
8.95.1	150x125x27x2.80 mm	each	78.50
8.95.2	125x125x27x2.80 mm	each	67.50
8.95.3	100x125x27x2.80 mm	each	56.50
8.95.4	75x100x20x2.24 mm	each	41.00
8.96	Providing and fixing M.S. bright finished or black enameled Double spring hinges with iron screws:		
8.96.1	150 mm	each	317.00
8.96.2	125 mm	each	286.00
8.96.3	100 mm	each	247.00
8.97	Providing and fixing M.S. bright finished or black enameled Piano hinges 1mm thick with 35mm wide flange including necessary iron screws.	metre	97.50
8.98	Providing and fixing M.S. nickel plated Piano hinges 1mm thick with 35mm wide flange including necessary iron screws.	metre	111.00
8.99	Providing and fixing M.S. bright finished or black enameled sliding door bolts with bolts, nuts and necessary iron screws:		
8.99.1	300x16mm	each	77.50
8.99.2	250 x 16 mm	each	72.50
8.100	Providing and fixing M.S. bright finished or black enameled door latch with necessary iron screws:		
8.100.1	300x20x6mm	each	53.50
8.100.2	250x20x6mm	each	50.50
8.101	Providing and fixing M.S. bright finished or black enameled 85x12mm pull bolt lock with necessary nuts and necessary iron screws.	each	35.50
8.102	Providing and fixing M.S. bright finished or black enameled Tower bolts (Barrel type) with necessary iron screws:		
8.102.1	250 mm	each	34.50

Code No	Description	Unit	Rate Rs.
8.102.2	200 mm	each	29.00
8.102.3	150 mm	each	23.00
8.102.4	100 mm	each	16.50
8.103	Providing and fixing M.S. bright finished or black enameled handles with necessary iron screws:		
8.103.1	125 mm	each	51.00
8.103.2	100 mm	each	45.50
8.103.3	75 mm	each	22.50
8.104	Providing and fixing M.S. bright finished or black enameled hooks and eyes with necessary iron screws:		
8.104.1	300 mm	each	18.00
8.104.2	250 mm	each	15.50
8.104.3	200 mm	each	13.00
8.104.4	150 mm	each	11.00
8.104.5	100 mm	each	7.80
8.105	Providing and fixing M.S. bright finished or black enameled safety hasp and staples with necessary iron screws:		
8.105.1	150 mm	each	35.50
8.105.2	115 mm	each	13.50
8.105.3	90 mm	each	11.50
8.106	Providing and fixing MS bright finished single hanging door stopper with necessary MS steel screws complete.	each	12.50
8.107	Providing and fixing powder coated M.S. butt hinges with necessary iron screws:		
8.107.1	125x65x2.12 mm	each	36.50
8.107.2	100x58x1.90 mm	each	24.50
8.107.3	75x47x1.7 mm	each	16.50
8.107.4	50x37x1.5 mm	each	9.30
8.108	Providing and fixing powder coated M.S. parliamentary hinges with necessary iron screws:		
8.108.1	150x125x27x2.8mm	each	81.50
8.108.2	125x125x27x2.8mm	each	70.50
8.108.3	100x125x27x2.8 mm	each	59.00
8.108.4	75x100x20x2.24 mm	each	39.50
8.109	Providing and fixing powder coated M.S. piano hinges with necessary iron screws:		

Code No	Description	Unit	Rate Rs.
8.109.1	Overall width 35mm	each	97.50
8.109.2	Overall width 50 mm	each	111.00
8.109.3	Overall width 65 mm	each	147.00
8.110	Providing and fixing powder coated M.S. pull bolt lock size 85x42mm with bolts, nut and necessary iron screws.	each	37.00
8.111	Providing and fixing powder coated M.S. Safety chain with necessary fixtures for doors. (Weighing not less than 200 gms.)	each	31.50
8.112	Providing and fixing powder coated M.S. sliding door bolts with bolts, nuts and necessary iron screws:		
8.112.1	300x16 mm	each	135.00
8.112.2	250x16 mm	each	127.00
8.113	Providing and fixing powder coated M.S. door latch with necessary iron screws:		
8.113.1	300x20x16 mm	each	46.00
8.113.2	250x20x16 mm	each	41.00
8.114	Providing and fixing powder coated M.S. pull bolt lock of size 85 x 12mm with necessary bolts, nuts and necessary iron screws.	each	34.00
8.115	Providing and fixing powder coated M.S. tower bolts (Barrel type) with necessary iron screws:		
8.115.1	250 x10mm	each	42.50
8.115.2	200 x10mm	each	33.50
8.115.3	150 x10mm	each	27.50
8.115.4	100 x10mm	each	19.00
8.116	Providing and fixing powder coated M.S. handles with necessary iron screws:		
8.116.1	125 mm	each	61.50
8.116.2	100 mm	each	45.50
8.116.3	75 mm	each	34.50
8.117	Providing and fixing powder coated M.S. hooks and eyes necessary iron screws:		
8.117.1	300 mm	each	44.50
8.117.2	250 mm	each	74.00
8.117.3	200 mm	each	89.50
8.117.4	150 mm	each	105.00
8.117.5	100 mm	each	120.00
8.118	Providing and fixing powder coated M.S. hasp and staples (Safety type) necessary iron screws:		

Code No	Description	Unit	Rate Rs.
8.118.1	150 mm	each	37.00
8.118.2	115 mm	each	14.00
8.118.3	90 mm	each	12.50
8.119	Providing and fixing powder coated MS hanging door stopper with necessary powder coated MS steel screws complete.	each	15.00
8.120	Providing and fixing aluminium sliding door bolts with 16mm rod, necessary nickel plated iron nuts bolts and screws etc complete.		
8.120.1	300x16mm	each	169.00
8.120.2	250x16mm	each	141.00
8.121	Providing and fixing aluminium door latch with 12mm rod, necessary nickel plated iron nuts bolts and screws etc complete.		
8.121.1	300x12mm	each	71.00
8.121.2	250x12mm	each	51.50
8.122	Providing and fixing aluminium tower bolts (Barrel type) with necessary nickel plated iron screws etc complete.		
8.122.1	250 x10mm	each	70.50
8.122.2	200 x10mm	each	57.50
8.122.3	150 x10mm	each	44.50
8.122.4	100 x10mm	each	31.00
8.122.5	75 x10mm	each	24.50
8.123	Providing and fixing aluminium door handles 2.5mm thick with necessary nickel plated iron screws etc complete.		
8.123.1	150 mm	each	30.50
8.123.2	125 mm	each	26.00
8.123.3	100 mm	each	21.50
8.124	Providing and fixing hanging aluminium door stopper with necessary nickel plated iron screws etc complete.		
8.124.1	Single	each	26.50
8.124.2	Double	each	37.00
8.125	Providing and fixing aluminium door mounted door stopper with necessary nickel plated iron screws etc complete.		
8.125.1	100 mm long	each	45.00
8.125.2	75 mm long	each	38.50
8.125.3	60 mm long	each	32.00
8.125.4	50 mm long	each	25.50

Code No	Description	Unit	Rate Rs.
8.126	Providing and fixing powder coated aluminium sliding door bolts with 16mm rod, necessary M.S. nuts bolts and screws etc complete.		
8.126.1	300x16mm	each	175.00
8.126.2	250x16mm	each	150.00
8.127	Providing and fixing powder coated aluminium door latch with 12mm rod, necessary M.S. nuts bolts and screws etc complete.		
8.127.1	300x12mm	each	75.00
8.127.2	250x12mm	each	54.50
8.128	Providing and fixing powder coated aluminium tower bolts (Barrel type) with necessary M.S. screws etc complete.		
8.128.1	250 x10mm	each	74.50
8.128.2	200 x10mm	each	60.00
8.128.3	150 x10mm	each	46.50
8.128.4	100 x10mm	each	32.00
8.128.5	75 x10mm	each	25.50
8.129	Providing and fixing powder coated aluminium door handles 2.5mm thick with necessary M.S. screws etc complete.		
8.129.1	150 mm	each	32.00
8.129.2	125 mm	each	27.50
8.129.3	100 mm	each	22.50
8.130	Providing and fixing hanging powder coated aluminium door stopper with necessary M.S. screws etc complete.		
8.130.1	Single	each	27.50
8.130.2	Double	each	38.50
8.131	Providing and fixing powder coated aluminium door mounted door stopper with necessary M.S. screws etc complete.		
8.131.1	100 mm long	each	47.00
8.131.2	75 mm long	each	40.00
8.131.3	60 mm long	each	33.00
8.131.4	50 mm long	each	26.50
8.132	Providing and fixing stainless steel butt hinges IS : 12817 marked with necessary stainless steel screws etc complete.		
8.132.1	150x2.5mm (heavy)	each	97.50
8.132.2	125x2.5mm (heavy)	each	76.50
8.132.3	100x2.5mm (heavy)	each	52.50
8.132.4	75x2.5mm (heavy)	each	34.50

Code No	Description	Unit	Rate Rs.
8.132.5	125x1.9mm (light)	each	60.00
8.132.6	100x1.7mm (light)	each	40.00
8.132.7	75x1.7mm (light)	each	28.00
8.133	Providing and fixing stainless steel cutt hinges having thickness 1.2mm necessary stainless steel screws etc complete.		
8.133.1	75x19x13mm	each	22.00
8.133.2	60x19x13mm	each	21.50
8.133.3	50x15x10mm	each	20.00
8.134	Providing and fixing stainless steel narrow hinges having thickness 1.2mm necessary stainless steel screws etc complete.		
8.134.1	75x18x18mm	each	22.50
8.134.2	60x18x18mm	each	21.50
8.134.3	75x15x15mm	each	22.00
8.134.4	60x15x15mm	each	21.50
8.135	Providing and fixing stainless steel parliamentary hinges having thickness 2.5mm necessary stainless steel screws etc complete.		
8.135.1	150x100mm	each	134.00
8.135.2	125x100mm	each	119.00
8.135.3	100x100mm	each	103.00
8.135.4	75x100mm	each	89.50
8.136	Providing and fixing stainless steel piano hinges with necessary stainless steel screws etc complete.		
8.136.1	Overall width 35mm	each	138.00
8.136.2	Overall width 25 mm	each	123.00
8.137	Providing and fixing stainless steel sliding door bolts with 16mm rod, 2.5mm thick flap, necessary stainless steel nuts bolts and screws etc complete.		
8.137.1	300mm	each	238.00
8.137.2	250mm	each	228.00
8.138	Providing and fixing stainless steel door latch with 12mm rod, 2.5mm thick flap, necessary stainless steel screws etc complete.		
8.138.1	300mm	each	92.50
8.138.2	250mm	each	85.00
8.139	Providing and fixing stainless steel tower bolts (Barrel type) with necessary stainless steel screws etc complete.		
8.139.1	250 x10mm	each	97.00
8.139.2	200 x10mm	each	70.50

Code No	Description	Unit	Rate Rs.
8.139.3	150 x10mm	each	57.50
8.139.4	100 x10mm	each	41.00
8.139.5	75 x10mm	each	36.00
8.140	Providing and fixing stainless steel door handles having flap thickness 2.5mm, necessary stainless steel screws etc complete.		
8.140.1	150 mm	each	24.50
8.140.2	125 mm	each	22.50
8.140.3	100 mm	each	22.00
8.141	Providing and fixing Stainless steel "D" shape door handles made of 10mm dia rod with necessary stainless steel screws etc complete.		
8.141.1	200 mm	each	64.00
8.141.2	150 mm	each	49.50
8.141.3	125 mm	each	42.00
8.141.4	100 mm	each	35.00
8.141.5	75 mm	each	27.50
8.142	Providing and fixing stainless steel hooks and eyes with 5.6mm dia rod with necessary stainless steel screws etc complete.		
8.142.1	200 mm	each	27.00
8.142.2	150 mm	each	25.50
8.142.3	125 mm	each	23.50
8.142.4	100 mm	each	22.00
8.143	Providing and fixing stainless steel hanging door stopper with necessary stainless steel screws complete.		
8.143.1	Single	each	47.00
8.143.2	Double	each	65.00
8.144	Providing and fixing stainless steel fixed stopper with necessary stainless steel screws complete.		
8.144.1	100 mm long	each	96.50
8.144.2	75 mm long	each	81.00
8.144.3	60 mm long	each	73.50
8.144.4	50 mm long	each	65.00
8.145	Providing and fixing magnetic catcher in cupboard / ward robe shutters including fixing with necessary screws etc. complete.		
8.145.1	Triple strip vertical type.	each	21.00
8.145.2	Double strip (horizontal type).	each	16.50

Code No	Description	Unit	Rate Rs.
8.146	Providing and fixing powder coated telescopic drawer channels with necessary screws etc. complete as per directions of Engineer-in-charge.		
8.146.1	300 mm long	pair	180.00
8.146.2	400 mm long	pair	237.00
8.146.3	500 mm long	pair	295.00
8.147	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	14.50
8.148	Providing and fixing factory made UPVC door frame made of UPVC profile section having an overall dimension as below (tolerance ± 1mm) with wall thickness 2.0mm ± 0.2mm, corners of the door frame to be jointed with galvanized brackets and stainless steel screws, joints mitred and plastic welded. 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		
8.148.1	Extruded section Profile size 48x40 mm.	metre	191.00
8.148.2	Extruded section Profile size 42x50 mm.	metre	196.00
8.149	Providing and fixing factory made PVC door shutters of specified thickness made of styles and rails of a UPVC hollow section of specified 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 1.0 mm and stainless steel screws.		
8.149.1	24 mm thick door shutters with styles and rails of size 59x24 mm	sqm	2399.00
8.149.2	30 mm thick door shutters with styles and rails of size 60x30 mm	sqm	2488.00
8.150	Providing and fixing factory made 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.	sqm	2583.00
8.151	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 Engineer-in-Charge.	metre	346.00

Code No	Description	Unit	Rate Rs.
8.152	Providing and fixing 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 Manufacturer's specification including 3 nos ISI marked stainless steel hinges of size 100x58x1.9 mm complete. (for W.C. and bathroom door shutter).		
8.152.1	PVC door shutter	sqm	2318.00
8.152.2	Both side Pre-laminated panel PVC door shutter	sqm	2832.00
8.153	Providing and fixing 30 mm thick Glass Fibre Reinforced Plastic (FRP) paneled 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 5 thick FRP laminate for panels confirming to IS: 14856 - 2000, complete.	sqm	2112.00
8.154	Providing and fixing 30mm thick fibreglass 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.	sqm	2595.00
8.155	Providing and fixing factory made Pre-laminated particle board flat pressed three layer or graded wood particle board shutter (25 mm thick) 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 stainless steel hinges 100x1.7mm etc complete as per direction of Engineer-in-Charge	sqm	3483.00

Code No	Description	Unit	Rate Rs.
8.156	Providing and fixing cupboard shutters 25mm thick, with Pre-laminated flat pressed with decorative lamination one side and other side balancing lamination exterior Grade - I MDF Board 25mm thick confirming to IS:14587 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	1789.00
8.157	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	510.00
8.158	Providing and fixing IS: 3564 marked aluminium die cast body tubular type universal hydraulic door closer with necessary accessories and screws etc complete.	each	1450.00
8.159	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	1053.00
8.160	Providing and fixing expandable fasteners of specified size with necessary plastic sleeves and galvanized M.S screws including drilling holes in masonry work /CC/ R.C.C by drilling machine and making good etc complete.		
8.160.1	25 mm long	each	15.00
8.160.2	32 mm long	each	21.00
8.160.3	40 mm long	each	27.50
8.160.4	50 mm long	each	30.00
8.161	Supplying and fixing teak wood fillets (10 mm x 10 mm size) including nails etc complete.	metre	27.00
8.162	Providing and fixing factory made Fibreglass 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	5072.00

Note *** These items are to be executed only with prior permission of Chief Engineer**

9.0 STEEL AND ALUMINIUM WORK

A) MATERIALS:

All finished steel shall be well and cleanly rolled to the dimensions and weight specified by BIS subject to permissible tolerances as per IS 1852-1985. The finished materials shall be reasonably free from cracks, surface flaws laminations, rough and imperfect edges and all other harmful defects. The materials used in steel and aluminium work shall be as follows:

i) Structural steel shall be of tested, standard quality conforming to IS: 226:1975. Commercial quality shall conform to IS: 269:1969.

ii) 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.

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

iv) Welding of steel shall be electric arc welding as per IS: 816-1969 and shall be on the lines given in IS 800-1984. The electrodes required for metal arc welding shall confirm to IS: 814-1991

v) Rolling shutters should conform to IS: 6248-1979.

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

vii) Glass panes should conform to IS: 7452-1974.

viii) Screws shall conform to IS: 4218 (Part I to VI) 1967.

ix) Steel doors, windows & ventilators shall conform to IS: 1038-1983 and IS: 7452-1990.

x) 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 section are inclusive of the cost of concrete.

xi) Structural steel tube shall confirm to the IS:1161-1979. The steel tubes when analyzed in accordance with the method specified in IS: 226-1975, shall show not more than 0.06 percent sulphur, and not more than 0.006 percent phosphorus. Wall thickness of tubes used for construction exposed to weather shall be not less than 4 mm and for construction not exposed to weather it shall be not less than 3.2 mm. Where structures are not readily accessible for maintenance, the minimum thickness shall be 5 mm.

xii) Aluminium sections used for making doors, windows & ventilators shall conform to IS: 733-1983 and IS: 1285-1975. Aluminium sections used shall be anodised, transparent or dyed to the required shade and should conform to IS: 1868 (minimum anodic coating of grade AC-15). Hydraulic floor spring to be used shall conform to IS: 6315.

xiii) Pre-laminated particle board shall confirm to IS: 12823-1990.

xiv) Float glass shall be clear float glass and should be approved by the Engineer in Charge. It shall be clear, float transparent and free from cracks subject to allowable defects. The float glass shall conform to the IS 14900

WEIGHT CHART OF STEEL TUBES FOR STRUCTURAL PURPOSES

Nominal Bore (mm)	Outside Diameter (mm)	Class	Wall Thickness (mm)	Weight (kg/m)
15	21.3	H	3.2	1.44
20	26.9	H	3.2	1.87
25	33.7	M	3.2	2.41
		H	4.0	2.93
32	42.4	L	2.60	2.54
		M	3.2	3.10
		H	4.00	3.79
40	48.3	L	2.90	3.23
		M	3.2	3.56
		H	4.0	4.37
50	60.3	L-1	2.9	4.08
		M	3.6	5.03
		H	4.5	6.19
65	76.1	L	3.2	5.71
		M	3.6	6.42
		H	4.50	7.93
80	88.9	L	3.2	6.72
		M	4.00	8.36
		H	4.8	9.9
90	101.6	L	3.6	8.7
		M	4.0	9.63
		H	4.8	11.50
100	114.3	L	3.6	9.75
		M	4.5	12.2
		H	5.4	14.5
110	127.0	L	4.5	13.6
		M	4.8	14.50
		H	5.4	16.2
125	139.7	L	4.50	15.00
		M	4.8	15.90
		H	5.4	17.90
135	152.4	L	4.50	16.40
		M	4.8	17.50
		H	5.40	19.60
150	165.1	L	4.50	17.80
		M	4.8	18.90
		H	5.40	21.30
150	168.3	L	4.50	18.20
		M	4.8	19.40
		H-1	5.40	21.70
		H-2	6.3	25.20
175	193.7	L	4.8	22.40
		M	5.40	25.10
		H	5.9	27.30
200	219.1	L	4.8	25.40
		M	5.60	29.50
		H	5.90	31.00
225	244.5	H	5.90	34.70
250	273	H	5.90	38.90
300	323.90	H	6.30	49.30
350	355.60	H	8.00	68.60

B) FABRICATION

(i) Fabrication shall generally be done as specified in IS: 800-1984. The steel sections as specified shall be straightened and cut square to correct lengths and measured with a steel tape. The cut ends exposed to view shall be finished smooth. No two pieces shall be welded or otherwise joined to make up the required length of a member.

(ii) Welding shall be done by electric arc process as per IS: 816-1969 and 823-1964. Where electricity for public is not available, generators shall be arranged by the contractor at his own cost, unless otherwise specified. Gas welding shall only be resorted to using oxyacetylene lame with specific approval of the Engineer-in-Charge. Gas welding shall not be permitted for structural steel work.

(iii) Collapsible steel gates shall be of approved manufacture and shall be fabricated from the mild steel sections. The gates shall consist of double or single collapsible gate depending on the size of the opening. These shall consist of vertical double channels each 20 x 10 x 2 mm. at 10 cm. centre to centre braced with flat iron diagonals 20 x 5 mm and top and bottom rails of T- iron 40 x 40 x 6 mm @ 3.5 kg/m with 40 mm dia ball bearings in every fourth double channel, unless otherwise specified. Wherever collapsible gate is not provided within the opening and fixed along the outer wall surface, T- iron at the top may be replaced by flat iron 40 x 10 mm.

The collapsible gate shall be provided with necessary bolts and nuts, locking arrangement, stoppers and handles. Any special fittings like spring, catches and locks, shall be so specified in the description of item where so required. The gate shall open and close smoothly and easily.

(iv) Aluminium Frames shall be square and flat, both the fixed and openable frames shall be constructed of sections, which have been cut to length, mitred and mechanically jointed at the corners. Sub-dividing bar of units shall be tenoned and riveted into frames. All frames shall have corners welded to true right angles. For jointing hollow sections flash butt welding, argon arc welding or mechanically jointing by inserts shall be used. (Gas welding shall not be done). Concealed screws shall be used for jointing the sub-units. The aluminium doors shall be manufactured by reducing, the specified size shown in drawing, by 12.5 mm in height and 25 mm in sides, however the windows size will be reduced by 25 mm in height as well as in-sides.

C) SURFACING

(i) **Steel Sections:** All surfaces which are to be painted, oiled or otherwise treated shall be dry and thoroughly cleaned to remove all loose scale and loose rust. Surfaces not in contact but inaccessible after shop assembly, shall receive the full specified protective treatment before assembly. This does not apply to the interior of sealed hollow sections. Part to be encased in concrete shall not be painted or oiled. A priming coat of approved steel primer i.e. Red Oxide Zinc chrome primer conforming to IS:2074-1979 shall be applied before any member of steel structure are placed in position or taken out of workshop.

(ii) **Aluminium Sections:** The surfaces which are to be powder coated shall be thoroughly cleaned to remove all loose rust & scale. The powder coating of specified thickness shall be applied before any member of steel structure are placed in position or taken out of workshop.

D) ERECTION

Steel work shall be hoisted and placed in position carefully without any damage to itself and other building work and injury to workmen. Where necessary mechanical appliances such as lifting tackle winch etc. shall be used. The suitability and capacity of all plant and equipment used for erection shall be to the satisfaction of the Engineer-in-Charge.

E) TESTING

The steel will be tested for Tensile Strength and Bend Test as per IS:1599-1974 for the quantity 20 Tonne and at every 20 Tonne or part thereof.

F) MEASUREMENTS

(i) The steel sections (each and every component) as fixed in place shall be measured in running metre correct to a centimetre and weights calculated on the basis of standard tables correct to the nearest two decimal places of kilogram, where unit of payment is in kilogram. However where the actual weight of section used is less than standard weight then the weight shall be calculated on the basis of actual weight.

(ii) The length shall be measured in running metre correct to a centimetre along the center line of the frames, where unit of measurement is running metre.

(iii) No measurement shall be made on average per sqm weight basis of the fabricated articles.

(iv) The unit weight of MS sheet, wherever required shall be taken as 7.85 kg/sqm for every mm thickness.

(v) The collapsible gate shall be measured on height and width correct to a centimeter and area shall be calculated in sqm correct to two places of decimal.

(vi) For rolling shutters clear width and clear height of the opening for rolling shutter shall be measured correct to a mm. The clear distance between the two jambs of the opening shall be clear width and the clear distance between the sill and the soffit (bottom of lintel) of the opening shall be the clear height. The area shall be calculated in square metres correct to two places of decimal.

(vii) The height and breadth shall be measured correct to a cm. The area shall be calculated in sqm upto two places of decimal where the unit of measurement is sqm.

(viii) The length of each extruded aluminium section used for fabrication shall be measured correct to 1 mm, and the weight of material used shall be calculated on the basis of actual weight of extruded section used for fabrication upto two places of decimal . The inserts/angle clits used for joining the section will not be measured.

G) RATE

(i) The rate of steel work includes cost of all material, labour, hardware, T&P, wastages and hire & running charges of machinery, etc. and also includes cost of all fixtures, erecting & fixing position including priming coat.

(ii) The rate of aluminium doors, windows & ventilator and all aluminium fabrication work includes cost of all material, labour, hardware, T&P, wastages and hire & running charges of machinery etc. and also includes cost of all fixtures, erecting & fixing position.

9.0 STEEL AND ALUMINIUM WORK

Code No	Description	Unit	Rate Rs.
9.1	Structural steel work in single section including cutting, hoisting, fixing in position and applying a priming coat of red oxide zinc chromate primer.	kg	61.50
9.2	Structural steel work riveted or bolted or welded in built-up sections, trusses and frames work upto a height of 5m above plinth level, including cutting, hoisting, fixing in position and applying a priming coat of red oxide zinc chromate primer.	Kg	66.00
9.3	Steel work in tubular (round, square or rectangular hollow tubes etc.) structure in built-up sections, trusses and frame work including cutting, hoisting, fixing in position upto a height of 5m above plinth level, consisting of columns trusses, roof and bottom purlins, base plate, holding down bolts, wind ties bracing (if required), bolts, nuts and washers for fastening etc. complete with applying a priming coat of red oxide zinc chromate primer.		
9.3.1	Electric resistance or induction butt welded tubes Grade-250	kg	88.50
9.3.2	Electric resistance or induction butt welded tubes Grade-300	kg	93.50
9.4	Extra for curvature in making steel work in tubular structure in built-up sections, trusses and frame work	kg	2.30
9.5	Extra for hoisting trusses and placing in position over height above 5m for every 2.5 m height or part thereof.	kg	2.70
9.6	Steel work welded in built up sections/ framed work including cutting, hoisting, fixing in position and applying a priming coat of red oxide zinc chromate primer.		
9.6.1	In stringers, treads, landings etc. of stair cases including use of chequered plate wherever required, all complete.	Kg	70.00
9.6.2	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works.	Kg	68.00
9.7	Providing and fixing M.S. round holding down bolts with nuts, washer and plate in cement concrete complete.	kg	71.50
9.8	Providing and fixing M.S. rivets of sizes in position	kg	91.50
9.9	Welding by gas plant.	cm	2.10
9.10	Welding by electric plant.	cm	1.70
9.11	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2mm and braced with flat iron diagonals 20x5mm size with top and bottom rails of T-iron 40x40x6mm with 38mm steel pulleys complete with bolts, nuts, locking arrangement stoppers, handles including applying a priming coat of red oxide zinc chromate primer.	sqm	3330.00

Code No	Description	Unit	Rate Rs.
9.12	Providing and fixing sliding shutter with M.S. sheet 1mm thick, frame and diagonal braces of 40x40x6mm angle iron, 3.0 mm thick M.S. gusset plates at junctions and corners, 25mm dia pulley, 40x40x6mm angle and T-iron guide at top and bottom respectively including applying a priming coat of red oxide zinc chromate primer.	kg	71.50
9.13	Providing and fixing steel door/ window with M.S. sheet 1mm thick, frame of angle iron, diagonal braces of angle/ flat iron of suitable size, 3.00 mm M.S. gusset plates at junctions and corners, all necessary fittings complete including applying a priming coat of red oxide zinc chromate primer.	kg	75.00
9.14	Providing and fixing steel door made of angle iron of suitable sizes with M.S. grill of approved pattern made of M.S. flats or square or round bars coat of red oxide zinc chromate primer.	kg	79.50
9.15	Providing and fixing M.S. grill of approved pattern made of M.S. flats or square or round bars welded to steel frame of windows etc. including applying a priming coat welded to frame with all necessary fitting complete including applying a priming of red oxide zinc chromate primer.	kg	67.50
9.16	Providing and fixing M.S. frames of doors, windows, ventilators and cupboards joints mitred and welded with 15x3 mm lugs 10cm long embedded in cement concrete blocks 15x10x10cm of grade M-10 or with wooden plugs and screws or with dash fastener 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 primer.		
9.16.1	"T" –iron frames	kg	74.00
9.16.2	Angle-iron frames	kg	73.50
9.16.3	MS tubular frames	kg	80.50
9.17	Providing and fixing factory made ISI marks steel doors, windows and ventilators side/ top/ centre hung made up of standard rolled steel section conforming to IS 1038:1968 (viz. F7D, F4B, K11 and K12B etc.), joints mitred and flash butt and sash bars tenoned and riveted/ welded with 10 cm long lugs of size 15x3mm embedded in cement concrete block 15x10x10 cms of 1:3:6 (1 cement :3 Coarse sand: 6 graded stone aggregate 20 mm nominal size) or rawl plugs and screws or with bolts and nuts as required including providing and fixing of hinges, pivots, handles, pegs, stays, rolling devices, locking arrangements, spring catch etc., as required complete including applying a priming coat of red oxide zinc chromate primer.	kg	88.00
9.18	Providing and fixing in position doors, windows and ventilators frames made of cold rolled pressed steel sheet framed profiles made from commercial M.S. Sheets conforming to I.S. 513 of 1973 and as per general specifications of I.S 4351 including hinges jamb, lock jamb, steel butt hinges, base tie, joints mitred and welded with 10cm long legs of size 15x3mm M.S. flat, embedded in cement concrete blocks 15x10x10cm size of grade M-10 or rawl plugs and screws or with fixing clips or with bolts and nuts including neatly compacted filling M-10 cement concrete in		

Code No	Description	Unit	Rate Rs.
	profile section applying a priming coat of red oxide zinc chromate primer.		
9.18.1	Single rebate/ mullion 80mmx50mm size, 1.25mm thick sheet	metre	361.00
9.18.2	Single rebate/ mullion 80mmx50mm size, 1.6mm thick sheet	metre	435.00
9.18.3	Single rebate/ mullion 100mmx50mm size, 1.25mm thick sheet.	metre	391.00
9.18.4	Single rebate/ mullion 100mmx50mm size, 1.6mm thick sheet.	metre	474.00
9.18.5	Double rebate 115mmx50mm size, 1.6mm thick sheet	metre	528.00
9.19	Providing and fixing in position door shutter made of square/ rectangular hollow steel tube of approved size joint mitred, welded frame with two Nos. intermediate rails, 200mm wide lock rail made of 1.6mm thick M.S. sheet welded to intermediate rail, M.S. grill of approved pattern made of M.S. flat or square or round bars welded to frames and provided M.S. butt hinges, all necessary fitting and finished by filling putty including applying a priming coat of red oxide zinc chromate primer all complete. (To be used in safety door shutters in buildings)	kg	93.50
9.20	Fixing standard steel doors, windows, and ventilators in walls with 10 cm long lugs of size 15x3mm embedded in cement concrete block 15x10x10cm size 1:3:6 (1 Cement : 3 Sand : 6 Stone aggregate 20 nominal size) or rawl plugs and screws or with bolts and nuts as required (steel windows with lugs shall be supplied by department).	sqm	10.00
9.21	Providing and fixing float glass panes with steel glazing clips and special metal sash putty of approved make in steel doors, windows, ventilators:		
9.21.1	4mm thick	sqm	535.00
9.21.2	5mm thick	sqm	631.00
9.21.3	6mm thick	sqm	727.00
9.22	Providing and fixing 3 mm fibre glass pane with steel glazing clips and special metal sash putty of approved make in steel doors, windows, ventilators.	sqm	678.00
9.23	Providing and fixing frosted glass panes with steel glazing clips and special metal sash putty of approved make in steel doors, windows, ventilators:		
9.23.1	4 mm thick	sqm	604.00
9.23.2	5 mm thick	sqm	717.00
9.23.3	6 mm thick	sqm	871.00
9.24	Providing and fixing tinted glass panes with steel glazing clips and special metal sash putty of approved make in steel doors, windows, ventilators:		
9.24.1	4 mm thick	sqm	642.00
9.24.2	5 mm thick	sqm	765.00
9.24.3	6 mm thick	sqm	923.00
9.25	Providing and fixing sun glass film over glazed doors windows & ventilators etc. complete	sqm	316.00

Code No	Description	Unit	Rate Rs.
9.26	Extra for providing and fixing mild steel beading of size 15x3mm with screws instead of glazing clips and metal sash putty in steel doors, windows, ventilators and composite units.	metre	31.50
9.27	Supplying and fixing rolling shutter of approved makes made of 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 out side locking with push and pull arrangement complete but excluding the cost of top cover and spring.		
9.27.1	80x1.25mm M.S. Laths	sqm	1691.00
9.27.2	80x1.20mm M.S. Laths	sqm	1570.00
9.27.3	80x0.90mm M.S. Laths	sqm	1485.00
9.28	Providing and fixing 27.5cm long wire spring for rolling shutters.	each	362.00
9.29	Providing and fixing M.S. sheet top cover for rolling shutter		
9.29.1	1.25mm thick	sqm	540.00
9.29.2	1.20mm thick	sqm	530.00
9.29.3	0.90mm thick	sqm	399.00
9.30	Providing and fixing ball bearing for rolling shutters.	each	423.00
9.31	Providing and fixing mechanical device chain and crank operation for operating rolling shutters.	set	5672.00
9.32	Extra for providing grilled rolling shutter manufactured out of 8 mm dia. M.S. bar instead of laths as per approved design (area of grill provided, only to be measured).	sqm	327.00
9.33	Providing and fixing GI wire gauge of average width of aperture 1.56mm with wire of 0.45mm to existing steel door, window shutter frames with necessary M.S. strip beading etc. complete.	sqm	569.00
9.34	Providing and fixing stainless wire gauge of average width of aperture 1.56mm with wire of 0.35mm to existing steel door, window shutter frames with necessary M.S. strip beading etc. complete.	sqm	791.00
9.35	Providing and fixing approved pipe hand rail by welding to iron railing including applying a priming coat of red oxide zinc chromate primer.		
9.35.1	M.S Pipe	kg	80.50
9.35.2	E.R.W. pipe	kg	90.00
9.35.3	G.I. pipe	kg	93.00
9.36	Providing and fixing approved pipe hand rail to walls (ramps, stair cases) including cutting chases and repairing the same to original condition, applying a priming coat of red oxide zinc chromate primer.		
9.36.1	M.S Pipe	kg	71.00
9.36.2	E.R.W. pipe	kg	79.00
9.36.3	G.I. pipe	kg	84.50

Code No	Description	Unit	Rate Rs.
9.37	Providing and fixing M.S. fan clamp/hook for ceiling fan made out 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.	each	97.00
9.38	Providing and fixing broken glass 100 mm high in spacing not more than 40 mm both ways and laid in 50 mm thick (average) cement mortar 1:4 (1 cement : 4 coarse sand) over compound walls, prapet walls and the like.	sqm	268.00
9.39	Providing and fixing in position G.I. barbed wire (93.8gram/m) to concrete/ wooden/ angle iron posts (straight or diagonal) including securing and screwing with G.I. tying wire, G.I. stapples, G.I.U-nails or steel pins etc., complete(Cost of posts, struts to be paid for separately)	metre	9.40
9.40	Providing and fixing concertina coil fencing with required dia 610 mm (having 50 nos. round per 6 metre length) up to 3m height of wall with existing angle iron 'Y' shaped placed 2.4 m or 3.00 m apart 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 43.478gm/ metre (cost of M.S. angle, C.C. blocks shall be paid separately)	metre	164.00
9.41	Providing and fixing concertina fencing with reinforced barbed tape (R.B.T.) up to 3m height of wall with existing angle iron in any shape in one or more rows in horizontal/ vertical/inclined alignment tied with G.I. staples and G.I. clips 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 43.478gm/ metre (cost of M.S. angle, C.C. blocks shall be paid separately)(RBT tape to be measured for each row)	metre	14.00
9.42	Providing and fixing in position welded steel wire fabric to concrete/ wooden/ angle iron posts including securing and screwing with G.I. tying wire, G.I. staples, G.I.U-nails or steel pins etc., complete		
9.42.1	Aperture 75x25mm	sqm	551.00
9.42.2	Aperture 50x25mm	sqm	569.00
9.42.3	Aperture 50x50mm	sqm	535.00
9.42.4	Aperture 75x75mm	sqm	500.00
9.42.5	Aperture 100x100mm	sqm	448.00
9.43	Providing and fixing in position chain linked steel wire fabric made of 4 mm dia G.I. wire of required width in mesh to concrete/ wooden/ angle iron posts including securing and screwing with 2mm dia G.I. wire, G.I. staples, G.I.U-nails or steel pins etc., complete.		
9.43.1	Aperture 50x50mm	sqm	331.00
9.43.2	Aperture 75x75mm	sqm	291.00
9.44	Providing and fixing “NETLON insect screens” with 25mm wide Hook and loop tape all around to wooden/ aluminium/ steel windows, ventilators and the like complete.	Sqm	278.00

Code No	Description	Unit	Rate Rs.
9.45	Providing and placing in position angle iron post and strut of required size including bottom to be split and bent at right angle in opposite direction for required length and drilling holes upto 10 mm dia as per requirement including priming coat with red oxide zinc chromate primer and placing the post/ strut in cement concrete block.	Kg	69.50
9.46	Extra for powder coating (minimum 50 micron) on steel sections instead of red oxide zinc chromate primer	kg	24.50
9.47	Providing and fixing aluminium work for doors, windows, ventilators and partitions made out of extruded aluminium standard sections (main section with minimum 1.5mm thickness) conforming to IS: 733, IS: 1285 mitred and jointed mechanically including aluminium cleats, neoprene weather stripping gasket beveled edge beading, screws duly fixed in wall/ floor with fixing clips or hold fasteners or bolts and nuts as required aluminium sections shall be anodized transparent or dyed to approved shade according to IS: 1868, minimum anodic coating shall be of grade AC-15. (Glazing to be paid for separately:		24.50
9.47.1	For fixed portion	kg	331.00
9.47.2	For shutter of doors, windows & ventilators including providing and making provision for fixing of fitting wherever required including the cost of PVC/ neoprene gasket required (Fittings shall be paid for separately).	Kg	338.00
9.48	Extra for powder coated (minimum 50 micron) aluminium sections instead of anodized.	Kg	27.00
9.49	Extra for polyester powder coated (minimum 50 micron) aluminium sections instead of anodized.	Kg	34.50
9.50	Providing and fixing 12mm thick pre-laminated particle board flat pressed with decorative lamination and balancing lamination on specified sides exterior Grade – I MDF Board 12 mm thick confirming to IS:14587, including fixed in aluminium doors, windows shutters and partition frames with C.P. brass/ stainless steel screws etc. complete.		34.50
9.50.1	With decorative lamination on one side and balancing lamination on other side.	Sqm	845.00
9.50.2	With decorative lamination on both side	sqm	906.00
9.51	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with PVC/ neoprene gasket etc. complete. (Cost of aluminium snap beading shall be paid in basic item):		
9.51.1	With float glass panes of 4 mm thickness	sqm	611.00
9.51.2	With float glass panes of 5 mm thickness	sqm	708.00
9.51.3	With float glass panes of 6 mm thickness	sqm	804.00
9.51.4	With float glass panes of 8 mm thickness	sqm	1051.00
9.52	Providing and welding 1mm thick MS sheet on existing door/ window/ ventilator shutter frames including applying a coat of red oxide zinc cromate primer on both side.(MS strip if provided on periphery or as intermediate member shall be paid extra)	Sqm	585.00

Code No	Description	Unit	Rate Rs.
9.53	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. complete.	sqm	3159.00
9.54	Providing and fixing anodized aluminium framed grill (minimum anodic coating of grade AC 15)of of approved shape, pattern and design including cutting, bending, hoisting and erecting/ fixing to door, window frame or to wall with fixing clips or hold fasteners or bolts and nuts as required etc. complete.	kg	396.00
9.55	Providing and fixing of six/seven levers branded and approved mortise lock.	each	594.00
9.56	Providing and fixing of floor spring IS: marked (Everite, Door link or any equivalent make) with stainless steel cover plate	each	1920.00
9.57	Providing stainless steel railing/ grill made of S.S. flats, hollow S.S. pipe or square/ rectangular sections of approved design fixing in stair case, balcony or other places with metal fasteners and stainless steel bolts etc complete.		
9.57.1	SS Grade 204	kg	467.00
9.57.2	SS Grade 304	kg	525.00
9.58	Extra for providing and fixing tinted glass panes in aluminium door, window, ventilator shutters and partitions instead of float glass.		
9.58.1	4 mm thickness	sqm	107.00
9.58.2	5 mm thickness	sqm	134.00
9.58.3	6 mm thickness	sqm	196.00
9.58.4	8 mm thickness	sqm	206.00
9.59	Extra for providing and fixing reflective glass panes in aluminium door, window, ventilator shutters and partitions instead of float glass.		
9.59.1	4 mm thickness	sqm	309.00
9.59.2	5 mm thickness	sqm	292.00
9.59.3	6 mm thickness	sqm	353.00
9.59.4	8 mm thickness	sqm	544.00
9.60	Designing, providing and fixing aluminium frame work made of special aluminium section on building face with M.S. angle iron brackets fixed on RCC structure with S.S. hold fasteners, including providing and fixing two sided structural adhesive tape of appropriate grade (NORTON or equivalent), on aluminium sections for fixing aluminium/ glass panel, sealing on periphery of frame work, by providing EPDM gasket, silicon weather sealant between aluminium frame and building structure including hire charges of double scaffolding complete.	kg	357.00

Code No	Description	Unit	Rate Rs.
9.61	Providing and fixing aluminium composite panels in approved panel sizes, thickness and shape on aluminium frame work on face of building. (Frame to be paid separately)		
9.61.1	3mm thick	sqm	1283.00
9.61.2	4mm thick	sqm	1745.00
9.62	Providing and fixing laminated glass sheet of 8.76mm thickness in approved sizes on aluminium frame work on face of building. (Frame to be paid for separately).	sqm	2613.00

10.0 ROOFING AND CEILING

A) TERMINOLOGY

(i) **Accessories :** Purpose made fittings, such as apron flashing pieces, barge boards, bottom glazing flashing, corner piece (corner flashing), eaves filler pieces, expansion joints, hip capping, hip tile or cap, ridge capping, ridge finials, roof lights, ventilators, with which the roof is furnished.

(ii) **Eaves :** The lower edge of the inclined roof.

(iii) **Finial :** A decorative fitting used at the junction or ridges and hips to form a water proof covering and at the top of conical, pyramidal, or dome roofs.

(iv) **Flashing :** A strip of impervious material, usually metal used to exclude water from the junction between a roof covering and another part of the structure.

(v) **Gable :** Part of wall above the general eaves level at tie end of ridged or partially hipped roof.

(vi) **Gutter :** Any form of roof water channel.

(vii) **Hip :** The outer angle (more than 180 degree) formed by the inclined ridge between two intersecting roof slopes.

(viii) **Pitch:** The angle of inclination with the horizontal of the rafters or substructure surface on which the roof coverings are laid. In patent glazing, the angle at which the plane of a stretch of glazing is inclined to the horizontal.

(ix) **Pitched Roof :** A roof the pitch of which is greater than 10 degree to the horizontal.

(x) **Ridge :** The horizontal inter-section at the apex of the two rising roof surfaces inclined in opposite directions.

(xi) **Valley :** The re-entrant angle formed by the inter-section of two inclined roof surfaces.

(xii) **Verge:** Free edge of a roof surface ending at gable.

B) MATERIAL

Material should be used as specified in the item and shall conform to:

i) C.G.S. sheets shall conform to IS: 277 and having zinc coating of 750 grade.

ii) The A.C. sheets shall confirm to IS: 459

iii) The blown bitumen to be used for water proofing treatment shall conform to IS: 702

iv) All the fittings and fixtures used shall be of approved quality.

C) LAYING

(i) The sheets shall be laid on the purlins to a true plane, with the lines of corrugations parallel or normal to the sides of the area to be covered unless otherwise required as in special shaped roofs.

(ii) 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.

(iii) 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.

(iv) 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. While J hooks are used for fixing sheets on angle iron purlins, and L hooks are used for fixing 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.

(v) **Wind Tie :** Wind ties shall be of 40 x 6 mm flat iron section or of other size as specified. These shall be fixed at the eaves of the sheets. The fixing shall be done with the same hook bolts which secure the sheets to the purlins. The ties shall be paid for separately unless described in the item of roofing.

D) MEASUREMENT

(i) The length and breadth shall be measured correct to a cm. for sheet roofing. Area shall be worked out in sqm correct to two places of decimal. The superficial area of roof covering shall be measured on the flat without allowance for laps and corrugations. Portion of roof covering overlapping the ridge or hip etc. shall be included in the measurements of the roof. No separate measurement shall be made for priming/ painting coat on overlaps of CGS sheets and for J or L hooks, bolts and nuts, galvanized iron seam bolts and nuts, bituminous and galvanized iron limpet washers etc.

(ii) No deduction in measurement shall be made for opening upto 0.4 sqm and nothing extra shall be allowed for forming such openings. For any opening exceeding 0.4 sqm in area, deduction in measurements for the full opening shall be made and in such cases the labour involved in making these openings shall be paid for separately. Cutting across corrugation shall be measured on the flat and not girthed. No additions shall be made for laps cut through.

(iii) The items for which the unit of measurement is square meter, the length and breadth shall be measured correct to a cm. and area shall be work out in square meter correct to two place of decimal.

(iv) The items for which the unit of measurement is running meter, the length shall be measured correct to centimeter.

(v) The items for which the unit of measurement is each, the items shall be enumerated.

E) RATES:

The rate of this chapter includes cost of all material, labour, hardware, T&P, wastages, scaffolding, curing and hire & running charges of machinery etc. required to execute the work.

Code No	Description	Unit	Rate Rs.

Code No	Description	Unit	Rate Rs.
10.1	Providing corrugated G.I. sheet roofing including vertical/ curved surfaces fixed with galvanized iron, 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 including painting with primer and paint on overlapping of sheets complete excluding the cost of purlins rafters and trusses. (Zinc coating not less than 272 gms/sqm)		
10.1.1	1.00 mm thick sheet (weight 8.60 kg/m2)	sqm	964.00
10.1.2	0.80 mm thick sheet (weight 7.03 kg/m2)	sqm	810.00
10.1.3	0.63 mm thick sheet (weight 5.70 kg/m2)	sqm	678.00
10.1.4	0.5 mm thick sheet (weight 4.30 kg/m2)	sqm	540.00
10.2	Extra for straight cutting in C.G.I. sheet roofing for making opening of area exceeding 0.40 sqm for chimney stacks, sky light etc.		
10.2.1	1.00 mm thick sheet	sqm	23.00
10.2.2	0.80 mm thick sheet	sqm	21.50
10.2.3	0.63 mm thick sheet	sqm	18.50
10.2.4	0.50 mm thick sheet	sqm	15.50
10.3	Extra for racking or circular cutting in C.G.I. sheets roofing:		
10.3.1	1.00 mm thick sheet	sqm	138.00
10.3.2	0.80 mm thick sheet	sqm	136.00
10.3.3	0.63 mm thick sheet	sqm	134.00
10.3.4	0.50 mm thick sheet	sqm	108.00
10.4	Extra for making opening or recesses in C.G.I. sheets roofing of girth not more than 1 metre.		
10.4.1	Upto 100 sq.cm	each	26.50
10.4.2	Above 100 sq.cm. upto 400 sq.cm	each	46.50
10.4.3	Above 400 sq.cm. in area	each	74.00
10.5	Providing ridges or hips of 60cm overall width in plain G.I. sheet fixed with galvanized washers J or L hooks, bolts and nuts 8mm G.I. limpet and bitumen washers complete.		
10.5.1	1.00 mm thick sheet with zinc coating not less than 275gm/sqm	metre	596.00
10.5.2	0.80 mm thick sheet with zinc coating not less than 275 gm/sqm	metre	533.00
10.5.3	0.63 mm thick sheet with zinc coating not less than 275gm/sqm	metre	445.00
10.5.4	0.50 mm thick sheet with zinc coating not less than 275 gm/sqm	sqm	380.00
10.6	Providing valley of 90cm overall width in plain G.I. sheet 1.6 mm thick with zinc coating not less than 350gm/sqm fixed with galvanized iron J or L hooks, bolts and nuts 8 mm dia G.I. limpet and bitumen washers complete.	metre	1053.00

Code No	Description	Unit	Rate Rs.
10.7	Providing and flashing 38cm. over all width in plain G.I. sheet fixed, with galvanized iron J or L hooks bolts and nuts G.I. limpet washers and fixed in walls with cement mortar 1:3 (1 cement: 3 sand)		
10.7.1	G.I. plain sheet 1.25mm thick (weight 10.56 kg/m2)	metre	420.00
10.7.2	G.I. plain sheet 1.00 mm thick (weight 8.60 kg/m2)	metre	375.00
10.8	Providing and fixing flat iron brackets with bolts and nuts for holding G.I. sheet/ A.C. gutters.15 cm wide and 45 cm to 60cm over all semi circular portion.		
10.8.1	40x3mm	each	72.50
10.8.2	50x3 mm	each	84.00
10.9	Providing and fixing 15 cm. wide 45cm. overall semi circular plain G.I. sheet gutter with iron brackets 40x3 mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipe complete as per designs.		
10.9.1	0.80 mm thick sheet	metre	424.00
10.9.2	0.63 mm thick sheet	metre	381.00
10.10	Extra for providing and fixing wind ties of 40x6mm flat iron section.	metre	118.00
10.11	Supply and fixing of precoated galvanized iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm +/- 5% total coated thickness (TCT), 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 metre 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	636.00
10.12	Supply and fixing of polymer precoated galvalume profile sheets (PPGL) of approved size, shape and pitch of corrugation, total coated thickness (TCT) 0.60 mm +/- 5%, epoxy primer on both side of the sheet and colour polyester top coat 18-20 microns and 6-7 microns on bottom. Sheet should have protective guard film of 25 microns minimum to avoid scratches while transportation and should be supplied in single length upto 12 metre 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	693.00

Code No	Description	Unit	Rate Rs.
10.13	Supply and fixing of precoated TILE PATTERN profile sheets of approved make, colour, over all size, corrugation shape and pitch, having total coated thickness (TCT) 0.45 mm (approx weight 4.9 kg/sqm) with Zn-Al coating and superior paint and having yeild strength of 550 MPa. Sheet should have protective guard film of 25 microns minimum to avoid scratches while transportation. 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 excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.	sqm	942.00*
10.14	Providing and fixing 2mm thick semi transparent polycarbonate profile roofing sheet of approved make and colour to make any normal roofing / covering and fixing as per manufacture specification at spacing not more than 1.2 m centre to centre with EPDM gasket and silicon sealant fixed with self drilling stainless steel screws all complete as per direction of Engineer-in-Charge.	sqm	1900.00*
10.15	Extra for working height above 6 metre for fixing GI/ profile/ PVC/ polycarbonate sheet for every additional height of 1 metre of part thereof.	sqm	4.70
10.16	Providing and fixing precoated galvanised steel sheet roofing accessories 0.50 mm +/- 5% total coated thickness (TCT), 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 :		
10.16.1	Ridges plain (500-600mm)	metre	552.00
10.16.2	Flashings/ Aprons. (Upto 600 mm)	metre	539.00
10.16.3	North light curves.	metre	576.00
10.16.4	Barge board (Upto 300 mm)	metre	486.00
10.16.5	Crimp curve	metre	624.00
10.16.6	Gutter. (600 mm over all girth).	metre	629.00
10.17	Providing asbestos cement 6mm thick corrugated or semi corrugated sheets roofing fixed with galvanized J or L hooks, bolts and nuts 8mm dia G.I. plain bitumen washers complete excluding the cost of purlins, rafters and trusses.	sqm	347.00
10.18	Extra for asbestos cement corrugated/semi corrugated sheet roofing with vertical sheeting or sheeting to pitch exceeding 60 degree.	sqm	51.00
10.19	Extra for straight cutting in asbestos cement corrugated/ semi corrugated sheet roofing for making opening of area exceeding 0.40 sqm. for chimney stacks, sky light etc.	metre	44.00
10.20	Extra for racking or circular cutting in A.C. corrugated/ semi corrugated sheet roofing.	metre	57.50

Code No	Description	Unit	Rate Rs.
10.21	Extra for making opening or recesses in asbestos cement corrugated/ semi corrugated sheet roofing of girth not more than 1 metre:		
10.21.1	Not exceeding 100 sq.cm. in area	each	39.00
10.21.2	Exceeding 100 sq.cm but not exceeding 400 sq.cm in area	each	65.50
10.21.3	Exceeding 400 sq.cm. in area	each	93.00
10.22	Providing and fixing ridges and hips in asbestos cement sheet roofing with G.I., J or hooks, bolts and nuts 8 mm dia, G.I plain and bitumen washers complete.		
10.22.1	Plain angular ridges	metre	54.50
10.22.2	Serrated or plain wing adjustable ridges	metre	65.50
10.23	Providing and fixing asbestos cement roofing accessories with galvanized iron J or L hooks, bolts and nuts and/or G.I. seam bolts & nuts, G.I. plain & bitumen washers etc. complete.		
10.23.1	Apron flashing pieces	metre	73.00
10.23.2	Eaves filler pieces	metre	99.50
10.23.3	North light and ventilator curves	metre	106.00
10.23.4	Barge boards	metre	68.50
10.23.5	Ridge finials	pair	122.00
10.24	Providing & fixing UV stabilized fibreglass reinforced plastic (FRP) sheet roofing upto 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 rovings 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.		
10.24.1	2mm thick corrugated (2.5" or 4.2" or 6") or step-down (2"or 3"or 6") as specified.	sqm	766.00
10.24.2	2 mm thick flat	sqm	705.00
10.25	Providing and fixing corrugated fibre glass sheet roofing in any shade/ colour fixed with G.I. 'J' hooks, bolts, nuts and washers etc. complete but excluding cost of purlins, rafters, trusses etc. with:		
10.25.1	1.50mm thick fibre glass sheet	sqm	484.00
10.25.2	2.00mm thick fibre glass sheet	sqm	610.00
10.25.3	3.00mm thick fibre glass sheet	sqm	879.00
10.26	Providing and fixing plain fibre glass sheet roofing in any shade/ colour fixed with G.I. 'J' hooks, bolts, nuts and washers etc. complete but excluding cost of purlins, rafters, trusses etc. with:		
10.26.1	1.50mm thick fibre glass sheet	sqm	444.00

Code No	Description	Unit	Rate Rs.
10.26.2	2.00mm thick fibre glass sheet	sqm	563.00
10.26.3	3.00mm thick fibre glass sheet	sqm	800.00
10.27	Providing and fixing plain sheets ceiling with nails to the frame work for panels excluding frame work.		
10.27.1	4 mm thick A.C. plain sheets	sqm	311.00
10.27.2	6 mm thick A.C. plain sheets	sqm	349.00
10.28	Providing and fixing semi transparent polycarbonate compact sheet roofing of approved colour to make any normal shape of roofing / covering of any pitch and fixing with specially designed powder coated aluminium section with 60mm wide flange of standard design weighing not less than 1.1 kg/ m at spacing not more than 1.2 m centre to centre with EPDM gasket and silicon sealant on all four edges of aluminium section fixed with self drilling stainless steel screws all complete including aluminium edge angle 40 mm x 40 mm x3mm as per manufacture specification and as per direction of Engineer-in-Charge.		
10.28.1	6 mm thick twin wall	sqm	1395.00*
10.28.2	10 mm thick twin wall	sqm	1774.00*
10.28.3	10 mm thick triple wall	sqm	1963.00*
10.29	Providing and fixing 20mm thick wooden planks ceiling (frame work for base to be paid separately) with M.S. screws.		
10.29.1	With teak wood.	sqm	2148.00*
10.29.2	With other than teak wood (Sal, bija, Haldu)	sqm	1251.00
10.30	Providing and fixing 12 mm thick insulating board ceiling of approved quality with necessary nails etc., complete (Frame work to be paid separately).		
10.30.1	Natural colour insulating board	sqm	125.00
10.30.2	White face insulating board	sqm	422.00
10.30.3	Flame retardant face insulating board	sqm	381.00
10.31	Providing and fixing 18mm thick insulating board ceiling of approved quality with necessary nails etc., complete (Frame work to be paid separately).		
10.31.1	Natural colour insulating board	sqm	403.00
10.31.2	White face insulating board	sqm	488.00
10.31.3	Flame retardant face insulating board	sqm	447.00
10.32	Providing and fixing 3 mm thick hard board sheet ceiling of approved quality with necessary nails etc., complete (Frame work to be paid separately).		
10.32.1	Standard Quality Board.	sqm	242.00
10.32.2	Design boards.	sqm	304.00

Code No	Description	Unit	Rate Rs.
10.33	Providing and fixing 4.5mm thick hard board sheet ceiling of approved quality with necessary nails etc., complete (Frame work to be paid separately).		
10.33.1	Standard Quality Board.	sqm	265.00
10.33.2	Design boards.	sqm	344.00
10.34	Extra for circular cutting in ceiling with.		
10.34.1	Teak wood planks 20 mm thick	metre	28.50
10.34.2	Other than teak wood (Sal, Bija, Haldu)	metre	33.00
10.34.3	Insulating board 12 mm thick	metre	20.00
10.34.4	Insulating board 18 mm thick	metre	24.00
10.34.5	Hard board 3 mm thick	metre	13.00
10.34.6	Hard board 4.5 mm thick	metre	15.50
10.35	Providing and fixing square edges wooden beading 65x12mm section with screws of approved quality for ceiling.		
10.35.1	With teak wood	metre	112.00
10.35.2	With other than teak wood (Sal, Bija, Haldu)	metre	75.00
10.36	Extra for making chamfered edges of beading.	metre	6.00
10.37	Extra for providing and fixing ceiling to curved surface in narrow width	sqm	91.50
10.38	Providing and laying split (half cut) 25mm dia bamboo jaffree 150mm mesh including tying to the purlins and rafters with moonj ban or string complete.	sqm	135.00
10.39	Providing and laying non-modular brick tiles of class designation 3.5 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 .	sqm	249.00
10.40	Painting top of roofs with bitumen of approved quality @ 17kg/10Sqm, including cleaning the slab surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil complete.	sqm	94.50
10.41	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10mm and down grade) including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design :	metre	68.00
10.42	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1mx1mx650 micron thick (0.65mm), finished with 12mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement rounding the edge sand making and finishing the outlet complete.	each	205.00
10.43	Providing and laying single wheel tilling without batten.	sqm	341.00

Code No	Description	Unit	Rate Rs.
10.44	Providing and laying single wheel tiling over and including half split (splitted into 2 pieces) bamboo batten 50 to 70 mm at a distance of 200mm both side.	sqm	865.00
10.45	Providing and laying single wheel tiling over and including whole bamboo batten 50 to 70 mm at a distance of 200mm both side.	sqm	997.00
10.46	Providing and laying Manglore pattern tiles 20 mm thick (without hip or ridge tiles) on steel/ wooden frame (frame work to be paid separately)	sqm	592.00
10.47	Providing and laying Manglore pattern hips and ridge tiles fixed in cement mortar 1:6 etc. complete	metre	130.00
10.48	Providing and fixing Terracota tiles of approved design and size over and including 20mm thick cement plaster 1:3 including floating coat of cement slurry on bed and filling joints with neat cement slurry mixed with pigment to match the shade of tiles complete.	sqm	526.00
10.49	Providing and fixing ISI Marked designer tiles of approved design and size confirming to IS: 13801 over and including 20mm thick cement plaster 1:3 including floating coat of cement slurry on bed and filling joints with neat cement slurry mixed with pigment to match the shade of tiles complete.	sqm	1002.00
10.50	Providing and fixing 100 mm diameter and 60 cm long stone ware rain water spout in cement mortar 1:4 (1 cement : 4 fine sand)	each	61.50
10.51	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 150mm diameter and weighing not less than 440 grams.	each	57.00
10.52	Providing and fixing false ceiling on existing frame work with ceiling tiles.		
10.52.1	12mm thick unveneered Nova teak or equivalent super plain tiles	sqm	500.00
10.52.2	12 mm thick half random perorated tiles Perforated area 5%	sqm	442.00
10.52.3	12 mm thick half random perorated tiles perforated area 13%	sqm	479.00
10.52.4	12.5 mm thick Glass fibre reinforced Gypsum board.	sqm	297.00
10.53	Providing 10mm thick plaster of paris (Gypsum anhydrous) ceiling height of 5m. above floor level over strips (Sal, Bija, Haldu) 25x6mm with 10mm gap in between and reinforced with rabbit wire mesh fixed into wooden frame (Frame work to be paid separately)		
10.53.1	Flat surface	sqm	849.00
10.53.2	Curved surface	sqm	895.00
10.54	Extra for sunk or raised mouldings in the Gypsum board/ plaster of paris false ceiling.	sqm	185.00
10.55	Extra for providing plaster of paris (Gypsum and anhydrous) with ceiling above 5 m height from floor level.	sqm	52.00
10.56	Providing and fixing 12mm thick plaster of paris (Gypsum Anhydrous) with ceiling upto a height of 5 M. above floor level over wooden frame and rendering smooth with plaster of paris (Frame work to be paid separately).	sqm	191.00
10.57	Extra for providing and fixing ceiling to curved surfaces in narrow width.	metre	91.50

Code No	Description	Unit	Rate Rs.
10.58	Extra for providing 3 mm 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	457.00
10.59	Providing and fixing steel frame work for partition wall made from steel rectangular tube of 50x25mmx1.25mm (wall thickness) with welded joints complete with grinding the welded joints. The members of the frame work along the wall/floor/ceiling shall form a grid of not more than 1100mmx1100mm centre to centre of member in any direction and are to be screwed using 75x10 mm wood screws to the prefixed wooden plugs at an interval of not more than 500mm centre to center. The vertical members to be grouted in the floor upto 50mm deep including repairing of wall/floor/ceiling with 1:3 Cement mortar.	kg	94.00
10.60	Providing and fixing steel grid for false ceiling made from M.S. rectangular hollow tubes of 50x25x1.25mm (wall thickness) as main runners to be jointed to cross runners of same size by electric arc welding with spacing not exceeding 610x610mm in any direction. The frame to be screwed to the wall using wooden plugs and wood screws of size 50x8mm at an interval of not more than 300mm centre to centre. The grid to be supported using 6mm M.S. hanger bars at 1200mm centre to centre both ways bent, hooked, fixed to existing R.C.C. roof with fastner or to the truss as the case may be and bolted to the grid with the help of suitable M.S. holding cleats, complete.	kg	101.00
10.61	Providing and fixing at all height false ceiling consisting of frame work "W" / "U" / "L" sections made of G.I. sheet with zinc coating of grade 120 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 diax230mm long G.I. wire at every junction including fixing the gypsum board with ceiling section and perimeter channels 0.55mm 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 including providing and fixing 12.5 mm thick tapered edge gypsum board conforming to IS: 2095- Part-I all complete as per drawing and specification and direction of the Engineer in Charge but excluding the cost of painting.	sqm	658.00

Code No	Description	Unit	Rate Rs.
10.62	Providing and fixing Gypsum board wall paneling consisting of frame work "W" / "U" / "L" sections made of G.I. sheet with zinc coating of grade 120 consisting of G.I. section, 'W' profile (0.55mm thick) having a knurled web of 51.55mm and two flanges of 26mm each with lips of 10.5 mm placed at 610mm center to center in perimeter channel having one flange of 20mm and another flange of 30mm with thickness of 0.55mm and web of length 27mm fixed on the floor and the ceiling with the nylon sleeves with fully threaded self-tapping drive all screws, and 12.5mm Gypsum board conforming to IS: 2095 - 1996: Part - I, fixed to 'W' profile with 25 mm countersunk ribbed head screws at 200mm center to center, joints of the boards are finished with specially formulated jointing compound and 48mm wide fibre tape to provide seamless finish all complete as per the drawing & directions of Engineer-in-charge.	sqm	555.00
10.63	Providing and fixing 97mm thick Gypsum board partition upto ceiling height consisting of frame work "W" / "U" / "L" sections made of G.I. sheet with zinc coating of grade 120, consisting of floor and ceiling channel 50mm wide having equal flanges of 32mm and 0.55mm thick fixed to the floor and ceiling at the spacing of 610mm centre to centre with dash fastener of 12.5mm diameter 40mm length and the studs 48mm wide having one flange of 34mm and other flange 36mm and 0.55mm thick fixed vertically within flanges of floor and ceiling channel and placed at a spacing of 610mm centre to centre by 6mm dia bolts and nuts at both ends of partition fixed flush to wall with rawl plugs at spacing of 450mm centre to centre and fixing of boards to either side of frame work by 25mm dry wall screws on studs, floor and ceiling channels at the spacing of 300mm centre to center and 97mm thick Gypsum board which includes one layer of tapered edge 12.5mm thick Gypsum plaster board (conforming I.S. 2095-1982) screw fixed with 25mm screws at 300mm centre to centre to either side, including jointing and finishing to a flush finish with recommended jointing compound, jointing tape, joint finisher and two coats of primer suitable for board as per manufacture's specification and Direction of Engineer-in-charge all complete.	sqm	758.00
10.64	Providing and fixing of aluminium panel false ceiling of approved colour consisting of panels 300mm wide x 30 mm deep x 0.7mm thick with bevel edge and length up to 6.0 metre. The panels are made from corrosion resistance aluminium alloy AA 3005 (Al. Mg) (for higher strength and good roll forming characteristics) sheet chromatised for maximum bond between metal and paint, enamel painted twice under high temperature, one side with a full primer and finish coat and the other side (inner side) with a primer coating and Skin Coat on a Continuous Paint Line. Panel shall be fixed by clipping to panel carrier of size 41.5mm wide x 62mm deep x 0.95mm thick in standard length of upto 5 metre made of doubled baked black enamelled aluminium alloy AA 5050 (Al. Mg) with cut outs to hold the 300mm wide panels fixed at a distance of 0.3 m from wall and 2.4 m from centre to center. Panel carrier shall be suspended by means of G.I. suspension rod 4mm dia and a Galvanised suspension spring clip at a distance of 1.7 m centre to center. Wall trim box of size 15x30x15mm made from 0.4mm thick aluminium		

Code No	Description	Unit	Rate Rs.
	alloy sheet to be provided all along the wall to hold panels (only surface area of false ceiling is to be measured and no deductions for lights, diffusers, columns etc shall be made)		
10.64.1	With long Plain panels	sqm	4405.00*
10.64.2	With long perforated panels having perforation with 2.0mm dia and 5mm center to center and pasted with non woven tissue on the back side	sqm	4805.00*
10.65	Providing and fixing of aluminium tile false ceiling comprising of Tile of size 600 x 600mm x 0.7mm. The Tile ends will be raised with pips and stops to ensure positive engagement into the spring to enable for de-mounting of individual panels. The Tile sides will be sufficiently high to ensure a minimum deflection across the length of Tile. All Tiles will be bevel edged. The Tile shall be powder coated. The Tile shall be clipped into clip-in profile made of 0.5mm thick G.I sheet. The clip-in profile shall be supported from slab by means hold on clamp with clip and 4mm dia G.I. rod fixed to ceiling rigidly. Wall trim box of size 15x30x15mm made from 0.4mm thick aluminium alloy sheet to be provided all along the wall to hold panels (only surface area of false ceiling is to be measured and no deductions for lights, diffusers, columns etc shall be made)		
10.65.1	With Plain tiles	sqm	2863.00*
10.65.2	With perforated tiles having perforation with 2.5mm dia and 5mm center to center and pasted with non woven tissue on the back side	sqm	3659.00*

Note * **These items are to be executed only with prior permission of Chief Engineer**

11.0 PLASTERING AND POINTING

A) MATERIALS

The following materials are to be used in plastering:

i) Cement:- The specification of cement shall be same as described in chapter 3.

ii) Water:- The specification of water shall be same as described in chapter 3

iii) Sand :- Sand requiring use for mortar for plaster work shall confirm to IS:1542-1977. Grading of sand should be as given below:

GRADING OF SAND FOR USE IN PLASTER AS PER IS:1542-1977

IS Sieve Designation	Percentage passing
10mm	100
4.75mm	95 - 100
2.36mm	95 – 100
1.18mm	90 - 100
600 micron	80 - 100
300 micron	20 – 65
150 micron	0 – 50

iv) The maximum quantity of total clay, fine silt, fine dust in sand shall not exceed 5 %.

B) PREPARATION OF SURFACE:

The joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scrapping. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced.
In case of concrete surface if a chemical retarder has been applied to the form work , the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface.

C) MORTAR :

The mortar of the specified mix shall be used.

D) SCAFFOLDING:

(i) For all exposed brick work or tile work, double scaffolding independent of the work having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed.

(ii) For all other works in buildings, single scaffolding shall be permitted. In such cases the inner end of the horizontal scaffolding pole shall rest in a hole provided only in the header course for the purpose. Only one header for each pole shall be left out. Such holes for scaffolding shall, however, not be allowed in pillars/ columns less than one metre in width or immediately near the skew backs of arches. The holes left in masonry works for scaffolding purposes shall be filled and made good before plastering.

E) APPLICATION OF PLASTER:

(i) Ceiling plaster shall be completed before commencement of wall plaster.

(ii) Plastering shall be started from the top and worked down towards the floor. All putlog holes shall be properly filled in advance of the plastering as the scaffolding is being taken down. To ensure even thickness and a true surface, plaster about 15x15 cm shall be first applied, horizontally and vertically, at not more than 2 metres intervals over the entire surface to serve as gauges. The surfaces of these gauged areas shall be truly in the plane of the finished plaster surface. The mortar shall then be laid on the wall, between the gauges with trowel. The mortar shall be applied in a uniform surface slightly more than the specified thickness. This shall be beaten with thin strips of bamboo about one metre long to ensure through filling of the joints, and then brought to a true surface, by working a wooden straight edge reaching across the gauges, with small upward and side ways movements at a time. Finally the surface shall be finished off true with trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive troweling or over working the float shall be avoided.

(iii) All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arises, provision of grooves at junctions etc. where required shall be done without any extra payment. Such rounding, chamfering or grooving shall be carried out with proper templates or battens to the sizes required. When suspending work at the end of the day, the plaster shall be left, cut clean to line both horizontally and vertically. When recommencing the plastering, the edge of the old work shall be scrapped cleaned and wetted with cement slurry before plaster is applied to the adjacent areas, to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of wall and not nearer than 15 cm to any corners or arrises. It shall not be closed on the body of the features such as plasters, bands and cornices, nor at the corners of arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakages. The plastering and finishing shall be completed within half an hour of adding water to the dry mortar.

(iv) No portion of the surface shall be left out initially to be patched up later on. The plastering and finishing shall be completed within half an hour of adding water to the dry mortar. No portion of the surface shall be left out initially to be patched up later on.

F) FINISH:

The plaster shall be finished to a true and plumb surface and to the proper degree of smoothness as required. The work shall be tested frequently as the work precedes with a true straight edge not less than 2.5m long and with plumb bobs. All horizontal lines and surfaces shall be tested with a level and all jambs and corners with a plumb bob as the work proceeds.

G) THICKNESS:

The thickness of the plaster specified shall be measured exclusive of the thickness of key i.e. grooves or open joins in brick work. The average thickness of plaster shall not be less than the specified thickness. The minimum average thickness over any portion of the surface shall not be less than specified thickness, and variation shall be within the limits specified in CPWD specifications. The average thickness should be regulated at the time of plastering by keeping suitable thickness of the gauges. Extra thickness required in of wall or in plastering of masonry cornices etc. will be ignored.

H) CURING:

Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered.

The plaster shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages at the contractor's expense by such means as the Engineer-in-Charge may approve. The dates on which the plastering is done shall be legibly marked on the various sections plastered, so that curing for the specified period thereafter can be watched.

I) PRECAUTIONS:

(i) Any cracks which appear in the surface and all portions which sound hollow when tapped, or are found to be soft or otherwise defective, shall be cut out in rectangular shape and redone as directed by the Engineer-in-Charge.

(ii) When ceiling plaster is done, it shall be finished to chamfered edge at an angle at its junction with a suitable tool when plaster is being done. Similarly when the wall plaster is being done, it shall be kept separate from the ceiling plaster by a thin straight groove not deeper than 6 mm drawn with any suitable method with the wall while the plaster is green.

(iii) To prevent surface cracks appearing between junctions of column/beam and walls, 150 mm wide chicken wire mesh should be fixed with U nails 150 mm centre to centre before plastering the junction. The plastering of walls and beam/column in one vertical plane should be carried out in one go. For providing and fixing chicken wire mesh with U nails payment shall be made separately.

J) MEASUREMENT:

Length and breadth shall be measured correct to a cm and its area shall be calculated in square metres correct to two places of decimal.

Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves, or open joints in brick work.

The measurement of wall plaster shall be taken between the walls or partitions (the dimensions before the plaster shall be taken) for the length and from the top of the floor or skirting (if the skirting is to be provided) to the ceiling for the height. Depth of coves of cornices if any, shall be deducted.

The following shall be measured separately from wall plaster:
(i) Plaster bend 30 cm wide or under
(ii) Cornice beading and architraves or architraves moulded wholly in plaster.
(iii) Circular work not exceeding 6m in radius.

A coefficient of 1.63 shall be adopted for the measurement of one side plastering on honey comb work having 6x10cm opening.

Deduction in measurement, for opening etc, will be regulated as follows:

a) No deduction will be made for opening or ends of joists, beams, posts, girders, steps etc. upto 0.5 sqm in area and no additions shall be made either, for the jambs, soffits and sills of such openings. The above procedure will apply to both faces of wall.
b) Deduction for opening exceeding 0.5 sqm but not exceeding 3 sqm each shall be made for reveals, jambs, soffits sills, sills etc. of these openings.

i) When both faces of walls are plastered with same plaster, deductions shall be made for one face only.

ii) When two faces of walls are plastered with different types of plaster or if one face is plastered and other is pointed or one face is plastered and other is unplastered, deduction shall be made from the plaster or pointing on the side of the frame for the doors, windows etc. on which width of reveals is less than that on the other side but on deduction shall be made on the other side.

Where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of plaster and/or pointing as the case may be.

iii) For opening having door frame equal to or projecting beyond thickness of wall, full deduction for opening shall be made from each plastered face of wall.

c) For opening exceeding 3 sqm in area, deduction will be made in the measurements for the full opening of the wall treatment on both faces, while at the same time, jambs, sills and soffits will be measured for payment.

In measuring jambs, sills and soffits, deduction shall not be made for the area in contact with the frame of doors, windows etc.

K) RATE:

The rate shall include the cost of all labour and materials, T&P, scaffolding, all heights, leads & lifts involved in execution of the work.

11.0 PLASTERING AND POINTING

Code No	Description	Unit	Rate Rs.
11.1	Providing and making 6mm thick cement plaster of mix:		
11.1.1	In Cement mortar 1:3 (1 cement : 3 fine sand)	sqm	93.00
11.1.2	In Cement mortar 1:4 (1 cement : 4 fine sand)	sqm	87.00
11.2	Providing and making 12mm thick cement plaster of mix:		
11.2.1	In cement Mortar 1:3 (1 cement : 3 fine sand)	sqm	115.00
11.2.2	In Cement Mortar 1:4 (1 cement : 4 fine sand)	sqm	103.00
11.2.3	In Cement Mortar 1:5 (1 cement : 5 fine sand)	sqm	96.50
11.2.4	In Cement Mortar 1:6 (1 cement : 6 fine sand)	sqm	91.50
11.3	Providing and making 15mm thick cement plaster on the rough side of single or half brick wall of mix:		
11.3.1	In cement Mortar 1:3 (1 cement : 3 fine sand)	sqm	134.00
11.3.2	In Cement Mortar 1:4 (1 cement : 4 fine sand)	sqm	120.00
11.3.3	In Cement Mortar 1:5 (1 cement : 5 fine sand)	sqm	113.00
11.3.4	In Cement Mortar 1:6 (1 cement : 6 fine sand)	sqm	107.00

Code No	Description	Unit	Rate Rs.
11.4	Providing and making 20mm thick cement plaster on stone masonry of mix:		
11.4.1	In cement Mortar 1:3 (1 cement : 3 fine sand)	sqm	164.00
11.4.2	In Cement Mortar 1:4 (1 cement : 4 fine sand)	sqm	145.00
11.4.3	In Cement Mortar 1:5 (1 cement : 5 fine sand)	sqm	136.00
11.4.4	In Cement Mortar 1:6 (1 cement : 6 fine sand)	sqm	127.00
11.5	Neat Cement punning.	sqm	33.00
11.6	Providing and making 6mm thick cement plaster 1:3 (1 cement : 3 fine sand) finished with a floating coat of neat cement and a thick coat of lime wash on top of wall when dry for bearing of R.C.C. slab and beam.	sqm	105.00
11.7	Providing and making 18 mm thick cement plaster with under layer of 12mm thick cement plaster 1:5 (1 cement : 5 fine sand) finished with a top layer of 6mm thick cement plaster 1:3 (1 cement : 3 fine sand).	sqm	163.00
11.8	Providing and making 18mm thick cement plaster in two coats with under layer of 12mm thick plaster 1:5 (1 cement : 5 fine sand) and top layer of 6mm thick with cement plaster 1:3 (1 cement : 3 fine sand) finished rough with sponge.	sqm	167.00
11.9	Extra for providing and mixing water proofing materials in cement plaster work in proportion as recommended by manufacturer.	kg	43.50
11.10	Providing and mixing in cement mortar, triangular polyester fiber Recron 3s (Anti-shrinkage Admixture) of 6 mm length of approved make like Reliance industries Ltd etc. in proportion as recommended by manufacturer.	kg	366.00
11.11	Extra for plastering of exterior walls when height exceeds 10m above ground level for every additional height of 3.0m or part thereof.	sqm	22.50
11.12	Extra for plastering on circular work not exceeding 6.0 meters in radius.	sqm	8.90
11.13	Extra for plastering done on mouldings, cornices or architraves including neat finish to line and level.	sqm	134.00
11.14	Providing and making 18 mm terrazzo finish plastering rubbed and polished complete with under layer of 12mm thick cement plaster 1:3 (1 cement : 3 fine sand) and top layer of 6mm thick white or black or white and black marble chips of 3mm and down size laid in proportion of 4:7 (4 cement : 7 Marble chips) by volume.	sqm	497.00
11.15	Extra for 18 mm terrazzo finish plastering on circular work not exceeding 6m in radius.	sqm	27.50
11.16	Extra for using chocolate grey or yellow marble chips instead of white/ black marble chip in top layer of terrazzo finish plaster.	sqm	7.60
11.17	Extra for using Baroda green marble chips instead of white/ black marble chip in top layer of terrazzo finish plaster.	sqm	7.60

Code No	Description	Unit	Rate Rs.
11.18	Extra for using white cement instead of ordinary cement in top layer of terrazzo finish plaster.	sqm	40.00
11.19	Extra for adding red chocolate, orange or buff (Yellow) colour pigment in grey or white cement in top layer of terrazzo finish plaster.	sqm	11.00
11.20	Extra for adding blue or green colour pigment in grey or white cement in top layer of terrazzo finish plaster.	sqm	8.60
11.21	Extra for adding black colour pigment in grey or white cement in top layer of terrazzo finish plaster.	sqm	4.70
11.22	Providing and laying 27 mm thick washed stone grit plaster on exterior walls of height upto 10m above ground level in two layers, under layer 15mm thick plaster in cement mortar 1:4 (1 cement : 4 fine sand) furrowing the under layer with scratching tool, applying cement slurry on the under layer @ 2 Kg of cement per sqm, top layer 12mm thick cement concrete 1:1 (1 Cement: 1 Marble stone chips by weight 10mm nominal size) in panels with groove (size 1cm. x1cm) all around as per approved pattern including scrubbing and washing the top layer with brushes and water to expose the stone chippings complete (Payment for providing grooves shall be made separately).	sqm	315.00
11.23	Extra for providing aluminium channels of size 15mmx10mmx1.5mm in place of sunk and band panels.	metre	67.00
11.24	Extra for using chocolate grey or yellow marble chips instead of white/ black marble chip in top layer of grit finish plaster	sqm	19.00
11.25	Extra for using Baroda green marble chips instead of white/ black marble chip in top layer of grit finish plaster	sqm	19.00
11.26	Extra for using white cement instead of ordinary cement in top layer of grit finish plaster.	sqm	99.50
11.27	Extra for adding red, chocolate, orange or buff (yellow) colour pigment in grey or white cement in top layer of grit finish plaster.	sqm	72.50
11.28	Extra for adding blue or green colour pigment in grey or white cement in top layer of grit finish plaster.	sqm	56.00
11.29	Extra for adding black colour pigment in grey or white cement in top layer of grit finish plaster.	sqm	105.00
11.30	Extra for 27mm thick washed stone grit plaster for:		
11.30.1	Circular work not exceeding 6 m radius	sqm	30.00
11.30.2	Moulding cornices and cover.		
11.30.2.1	Straight cornices in their length	sqm	69.00
11.30.2.2	Curved cornices in their length	sqm	91.50
11.31	Providing and making 12mm thick plain cement mortar bands in cement mortar 1:4 (1 cement : 4 fine sand) per cm width:		
11.31.1	Flush bands	metre	2.10

Code No	Description	Unit	Rate Rs.
11.31.2	Sunk Bands	metre	2.60
11.31.3	Raised Band	metre	3.00
11.32	Providing and making 18 mm thick plain cement mortar band in cement mortar 1:4 (1 cement : 4 fine sand) per cm width:		
11.32.1	Flush bands	metre	2.50
11.32.2	Sunk Bands	metre	3.00
11.32.3	Raised Band	metre	3.30
11.32.4	Drip course	metre	3.60
11.33	Providing and making moulded mortar band in cement mortar 1:4 (1 cement : 4 fine sand) per cm width:		
11.33.1	12 mm thick	metre	4.20
11.33.2	18 mm thick	metre	5.60
11.34	Providing and making 18 mm thick moulded cement mortar band in two coats under layer of 12mm thick with cement mortar 1:5 (1 cement : 5 fine sand) and top layer 6mm thick with cement mortar 1:4 (1 cement : 4 fine sand) per cm width:	metre	6.70
11.35	Providing and making 18 mm thick artificial red stone plaster consisting of 12mm thick under coat plaster 1:4 (1 cement : 4 fine sand) and 6mm thick finishing coat of cement mortar 1:1:3 (1 cement :1 marble dust: 3 stone dust) mixed with red oxide to match the shade of red stone.	sqm	231.00
11.36	Extra for lining over plaster to imitate stone or concrete block walling.	sqm	23.50
11.37	Providing and making pointing on brick work with cement Mortar 1:3 (1 cement : 3 fine sand)		
11.37.1	Flush pointing	sqm	27.00
11.37.2	Ruled pointing	sqm	33.50
11.37.3	Cut off weather struck pointing	sqm	42.00
11.37.4	Raised and cut pointing	sqm	59.50
11.38	Providing and making pointing on stone work with cement Mortar 1:3 (1 cement : 3 fine sand)		
11.38.1	Flush pointing	sqm	50.50
11.38.2	Ruled pointing	sqm	57.00
11.38.3	Raised and cut pointing	sqm	106.00
11.39	Providing and making raised and cut pointing on stone work in white cement mortar 1:3 (1 White cement :3 Marble dust).	sqm	180.00
11.40	Making grove in cement plaster while plastering upto10 mm deep and 10 mm wide.	metre	1.30

Code No	Description	Unit	Rate Rs.
11.41	Providing and fixing chicken mesh weighting not less than 250 gms/ sqm as per IS : specification in the required width with 40mm long steel nails on vertical and horizontal surface near R.C.C. and brick walls junctions including scaffolding and all lead and lifts etc. complete before plastering upto 10mts in height.	sqm	86.00
11.42	Providing sand faced plaster to concrete or brick masonry surface in all positions in two coats, base coat 13mm thick in C.M. 1:4, cleaning the surface by combing it and finishing coat 8mm thick in C.M. 1:3 and taking out grains on surface by hand operated mechanical arrangement with cost of all material labour, all leads & lifts, and scaffolding etc. complete.	sqm	180.00

12.0 FLOORING

A) MATERIAL

The material to be used in flooring shall be as follows:

i) Cement : The specification for the cement will be same as prescribed in chapter No. 3

ii) Water: The specification for the Water will be same as prescribed in chapter No. 3

iii) Aggregate : The specification for the Fine and Coarse Aggregate will be same as prescribed in chapter No. 3

iv) Terrazo Flooring: Marble chips/ terrazzo floors, skirting and dados shall conform to IS: 2114-1984. Marble powder used in mosaic/terrazzo topping shall pass through IS: sieve No.30. Pigments used in terrazzo/marble chips shall be of permanent colour.

v) Precast Terrazo tile: Precast terrazzo tiles shall conform to IS: 1237-1959 and overall thickness of chequerred tiles should not be less than 22mm. The grooves in the chequerred shall be uniform and straight. The depth of the groove shall not be less than 3.0mm.

vi) Glazed Tiles: The glazed tiles white/ coloured, shall be of approved make and shall conform to IS: 777-1970. The top surface of the tiles shall be glazed. The glazed shall be either glossy or matt as specified. They shall be flat & true to shape and free from crack, crazing spots, chipped edges and corners. The glazing shall be of uniform shade.

vii) Precast Cement Concrete Tile: Precast Cement concrete tiles shall conform to IS: 1237-1980 and overall thickness of tiles should not be less than 22mm. The grooves in the chequerred shall be uniform and straight.

viii) 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.

PHYSICAL PROPERTIES OF MARBLE BLOCKS, SLABS AND TILES

S. N	Characteristics	Requirements	Method of Test.
1.	Moisture absorption after 24 hours 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

ix) Granite Stone: Granite stone 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.

x) Kota Stone: 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.

xi) 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. However, scattered spots upto 10mm diameter shall be permitted.

xii) Wooden Flooring : The wooden flooring shall conform to IS: 3670-1966. The wood used for the flooring should be of superior quality

xiii) The P.V.C. flooring material shall conform to IS 3461-1986 and it shall consist of thoroughly blended composition of thermoplastic binder, filler and pigments.

xiv) Rubber tiles flooring shall conform to I.S. 809-1970 and shall be of the sizes as shown in the drawing.

B) LAYING

i) The flooring should be laid of the material as specified in the item and on the base of specified mortar/ adhesive. The top surface of the flooring should be in a true surface with the required slope. The thickness of the flooring should be as specified.

ii) The joints shall be filled with the cement grout of the same shade as the colour of stone or tile. The edges of the cut tile/ stone should be rubbed smooth to ensure true joint. The size of the stone/tile should be as specified.

C) CURING

The curing shall be done for a minimum period of 7 days. Curing shall not be commenced until the top layer has hardened.

D) GRINDING & POLISHING

Grinding and polishing of different type of floorings requires different set of grinding stones. Polishing of different type of floorings shall be as per specifications.

(i) Grinding of Marble stone flooring (grinding for wax polishing), Terrazzo flooring (laid at sites), Terrazzo tile flooring, Terrazzo chequered tile flooring, Crazy marble flooring shall be done with machine with following stones:

a) First grinding with unit of carborandom stone no 60 grit size
b) Second grinding with unit of carborandom stone no 120 grit size
c) Third and final grinding with unit of carborandom stone no 320 grit size

Where machine is not accessible hand grinding may be permitted with following stones.

a) First grinding with unit of carborandom stone no 60 grit size
b) Second grinding with unit of carborandom stone no 80 grit size
c) Third and final grinding with unit of carborandom stone no 120 grit size

(ii) Grinding of Kota stone flooring shall be grinded with machine with following stones:

a) First grinding with unit of carborandom stone no 120 grit size
b) Second and final grinding with unit of carborandom stone no 320 grit size

Where machine is not accessible hand grinding may be permitted with following stones.

a) First grinding with unit of carborandom stone no 80 grit size
b) Second and final grinding with unit of carborandom stone no 120 grit size

(iii) **Wax Polishing:** Wax polish shall be of approved brand and manufacture and in sealed containers. It shall be applied in uniform layer to the dry surface of the floor/skirting.

When the layer of the wax is stiffened and surface of floor is saturated with the polish, polishing shall be resorted with machine fitted with bobs (pad of rags) and shall be done until shades of all chips have appeared and glossy surface is obtained.

The fresh polished floor surface shall be spreaded with dry saw dust to a thickness of about 12 mm uniformly. After the surplus wax has been soaked from the floor surface the saw dust shall be removed**.**

(iv) **Mirror polishing:** Mirror polishing shall be done upto finest grade stone grit till the mirror shine appears to the satisfaction of Engineer-in-Charge using recommended powder coating.

Note: Application of gray/ white cement slurry with/ without pigment and marble powder, before and during the grinding of surface, shall be as per requirement and specification.

E) MEASUREMENT:

(i) Length and breadth shall be measured correct to a cm and area as laid shall be calculated in square metres correct to two places of decimal. Length and breadth shall be measured before laying skirting, dado or wall plaster. No deduction shall be made not extra paid for voids not exceeding 0.20 sqm Deduction for ends of dissimilar material or other articles embedded shall not be made for areas not exceeding 0.10 sqm.

(ii) The thickness of the skirting shall be as stated. Length shall be measured along the finished face of riser, skirting or dado correct to a cm. Height shall be measured from the finished level of tread or floor to the top (the underside of tread in the case of steps). The height shall be measured correct to 5mm in case of risers and skirting 30 cm in height, correct to 1 cm in case height is more than 30 cm. The area shall be calculated in square meter, correct to two places of decimal

(iii) The flooring provided with kite or other complicated pattern will be paid for extra over the relevant item.

(iv) The strip upto 150mm width provided in the flooring will be paid for extra over the relevant item.

(v) The granite/ Jaisalmer stone strip (10mm wide or below) will be measured and paid in running meter and area will not be deducted from the relevant main flooring.

(vi) The aluminium/ glass strips shall be measured in running meter correct to centimeter and paid in relevant item.

F) RATE:

The rates include cost of all materials, labour, T & P, wastages, water for curing, hire & running charges of all type of machineries required and all lead & lifts of all materials etc. complete.

Code No	Description	Unit	Rate Rs.

Code No	Description	Unit	Rate Rs.
12.1	Applying cement slurry on R.C.C. slab or cement concrete work using 2.75 kg/ sqm for receiving cement concrete floor including roughening cleaning etc complete.	sqm	34.00
12.2	25mm thick cement concrete flooring with 1:2:4 cement concrete (1 cement : 2 coarse sand : 4 graded stone aggregate 12.5 mm nominal size) finished with floating cost of neat cement.	sqm	165.00
12.3	Cement concrete flooring with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm) finished with a floating coat of neat cement.		
12.3.1	40 mm thick	sqm	222.00
12.3.2	50 mm thick	sqm	254.00
12.3.3	75 mm thick	sqm	345.00
12.4	52 mm thick cement concrete flooring with under layer of 40mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) and top layer of 12 mm thick cement metallic hardener concrete mix 1:2 (1 cement hardener mix : 2 stone aggregate of 6 mm size by volume) with metallic hardening compound of approved quality mixed with cement in ratio of 4:1 (4 cement : 1 metallic floor hardening compound by weight) including finishing etc. complete.	sqm	441.00
12.5	Extra for making chequers of approved pattern on cement concrete flooring, landing, pavement etc.	sqm	16.00
12.6	Cement plaster skirting upto 30 cm. height with cement mortar 1:3 (1 cement : 3 fine sand) finished with a floating coat of neat cement including rounding of junction with floor.		
12.6.1	18 mm thick in two layers of 12mm and 6mm	sqm	200.00
12.6.2	21 mm thick in two layers of 15mm and 6mm	sqm	218.00
12.7	Providing and fixing ceramic glazed wall tiles conforming to IS : 15622 of approved make, colours, shades and size on wall and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with matching pigment complete.		
12.7.1	Size upto 200x300mm	sqm	587.00
12.7.2	Size above 200x300mm	sqm	646.00
12.8	Providing and fixing plain cement concrete fibre reinforced heavy duty designer glazed floor tiles with uniform colour (for coloured tiles) and texture conforming to IS: 1237 (for abrasion wear) and IS : 516 (for compressive strength) of approved make, colours, shades and size on cement Mortar bed and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with matching pigment complete.		
12.8.1	On wall and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement : 3 coarse sand)	sqm	921.00

Code No	Description	Unit	Rate Rs.
12.8.2	On floor, steps and risers over 20mm thick bed of cement Mortar 1:4 (1 cement : 4 coarse sand)	sqm	905.00
12.9	Providing and laying ceramic glazed floor tiles conforming to IS : 15622 of approved size, make, colour, shade laid on 20 mm thick Cement Mortar 1:4 (1 cement : 4 coarse sand) including pointing the joints with white cement mixed with matching pigment etc., complete.		
12.9.1	Size 300x300mm	sqm	692.00
12.9.2	Size above 300x300mm	sqm	728.00
12.10	Providing and laying rectified ceramic glazed floor tiles of size 300x300mm and above conforming to IS : 15622 of approved make, colour, shade laid on 20 mm thick Cement Mortar 1:4 (1 cement : 4 coarse sand) including pointing the joints with white cement mixed with matching pigment etc., complete.		
12.10.1	Size 300x300mm	sqm	858.00
12.10.2	Size above 300x300mm	sqm	905.00
12.11	Providing and laying porcelain floor tiles of size 600x600mm with water absorption's less than 0.5% and conforming to IS : 15622 of approved make , 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	710.00
12.12	Providing and laying vitrified floor tiles with soluble salt printing, of size 600x600mm with water absorption less than 0.5% and conforming to IS : 15622 of approved make, 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	963.00
12.13	Providing and laying vitrified floor tiles with double charge/ multi charge printing with water absorption less than 0.5% and conforming to IS : 15622 of approved make in all colours and shades and size mentioned below (+/- 10mm), laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc. complete.		
12.13.1	Size 600x600mm	sqm	1151.00
12.13.2	Size 800x800mm	sqm	1346.00*
12.13.3	Size 1000x1000mm	sqm	1562.00*
12.14	Extra for providing and laying vitrified floor tiles with 2-5mm grove in between the tiles including grouting the grove with water resistant epoxy compound or with white cement and approved pigments etc. complete.		
12.14.1	Size 600x600mm	sqm	54.00
12.14.2	Size 800x800mm	sqm	52.50
12.14.3	Size 1000x1000mm	sqm	51.50

Code No	Description	Unit	Rate Rs.
12.15	Deduct for not using 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) bedding in laying of floor tiles.	sqm	240.00
12.16	Extra for fixing glazed/ Ceramic/ Vitrified floor tiles with cement based high polymer modified quick-set tile adhesive (Water based) conforming to IS: 15477 (Type 1) for interior applications, using 5kg. adhesive per sqm of tile area, in 3mm-6mm thickness in place of cement mortar.	sqm	191.00
12.17	Extra for fixing glazed/ Ceramic/ Vitrified floor tiles with cement based high polymer modified quick-set tile adhesive (Water based) conforming to IS: 15477 (Type 2) for interior/exterior applications, using 5kg. adhesive per sqm of tile area, in 3mm-6mm thickness in place of cement mortar.	sqm	202.00
12.18	40mm thick marble chips flooring rubbed and polished to granolithic finish with under layer 34mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and top layer 6mm thick with white or black or white and black marble chips of size from 1mm to 4mm nominal size laid after mixing with cement marble powder in 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)		
12.18.1	Dark shade pigments with ordinary cement	sqm	405.00
12.18.2	Light shade pigment with white cement	sqm	449.00
12.18.3	Medium shade pigment with approx. 50% white cement, 50% ordinary cement	sqm	405.00
12.18.4	White cement without any pigment	sqm	400.00
12.18.5	Ordinary cement without any pigment	sqm	364.00
12.19	40mm thick marble chips flooring rubbed and polished to granolithic finish with under layer 31mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and top layer 9mm thick with white or black or white and black marble chips of size from 4mm to 7mm nominal size laid after mixing with cement marble powder in 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)		
12.19.1	Dark shade pigments with ordinary cement	sqm	449.00
12.19.2	Light shade pigment with white cement	sqm	488.00
12.19.3	Medium shade pigment with approx. 50% white cement, 50% ordinary cement	sqm	450.00
12.19.4	White cement without any pigment	sqm	448.00
12.19.5	Ordinary cement without any pigment	sqm	391.00
12.20	40mm thick marble chips flooring rubbed and polished to granolithic finish with under layer 28mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size) and top		

Code No	Description	Unit	Rate Rs.
	layer 12mm thick with white or black or white and black marble chips of size from 7mm to 10mm nominal size laid after mixing with cement marble powder in 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)		
12.20.1	Dark shade pigments with ordinary cement	sqm	491.00
12.20.2	Light shade pigment with white cement	sqm	545.00
12.20.3	Medium shade pigment with approx. 50% white cement, 50% ordinary cement	sqm	492.00
12.20.4	White cement without any pigment	sqm	490.00
12.20.5	Ordinary cement without any pigment	sqm	409.00
12.21	Marble chips skirting (upto 30 cm height) rubbed and polished to granolithic finish with layer 6mm thick with white or black or white and black marble chips of size from smallest of 4mm nominal size laid after mixing with cement marble powder in 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)		
12.21.1	18mm thick with under layer of 12mm thick cement plaster 1:3 (1 cement : 3 fine sand)		
12.21.1.1	Dark shade pigments with ordinary cement	sqm	403.00
12.21.1.2	Light shade pigment with white cement	sqm	430.00
12.21.1.3	Medium shade pigment with approx. 50% white cement, 50% ordinary cement	sqm	403.00
12.21.1.4	White cement without any pigment	sqm	402.00
12.21.1.5	Ordinary cement without any pigment	sqm	362.00
12.21.2	21mm thick with under layer of 15mm thick cement plaster 1:3 (1 cement : 3 fine sand)		
12.21.2.1	Dark shade pigments with ordinary cement	sqm	413.00
12.21.2.2	Light shade pigment with white cement	sqm	441.00
12.21.2.3	Medium shade pigment with approx. 50% white cement, 50% ordinary cement	sqm	414.00
12.21.2.4	White cement without any pigment	sqm	413.00
12.21.2.5	Ordinary cement without any pigment	sqm	372.00
12.22	Crazy marble stone flooring including filling the gaps with white cement marble powder mixture (3 white cement : 1 marble powder) by weight mixed with approved light shade pigment further mixed with white or black or white and black marble chips of sizes from 1mm to 4mm nominal size) in volumetric proportion of 4:7 (4 cement marble powder mix : 7 marble chips) and under layer of 25mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 12.5 mm nominal size) rubbing, polishing and cement slurry etc. complete.	sqm	462.00

Code No	Description	Unit	Rate Rs.
12.23	Extra for providing and fixing metal strip in joints of Terrazo floor/ cement concrete floor or like.		
12.23.1	Aluminium strips	kg	325.00
12.23.2	Brass strips	kg	402.00
12.24	Extra for providing and fixing 4mm thick AC sheet strip in joints of cement concrete floor or like.	sqm	268.00
12.25	Extra for providing and fixing 4mm thick glass strip in joints of Terrazo floor/ cement concrete floor or like.		
12.25.1	30 mm wide	metre	14.50
12.25.2	40 mm wide	metre	18.00
12.25.3	60 mm wide	metre	25.00
12.26	Extra for using chocolate grey or yellow marble chips instead of white & black chips in marble chips flooring or skirting.		
12.26.1	In top 6mm thick layer	sqm	7.60
12.26.2	In top 9 mm thick layer	sqm	12.00
12.26.3	In top 12 mm thick layer	sqm	15.00
12.27	Extra for Terrazzo flooring laid as floor borders marginal and similar bands exceeding 7.5 cm but not exceeding 30 cm in width	sqm	13.50
12.28	Extra for laying terrazzo in narrow band not exceeding 7.5 cm. in width	metre	4.50
12.29	Extra for laying terrazzo flooring in staircase treads not exceeding 30cm in width including cost of forming nosing etc.	sqm	20.00
12.30	Extra for making moulded noising in Terrazzo including returned moulded ends and angles to mouldings.	metre	40.50
12.31	Special surface finishing to treads and risers and the ends of concrete steps and the like including form work.	sqm	28.50
12.32	Precast Terrazzo tiles 22mm thick with graded white or black or white and black marble chips of size upto 6mm laid in floors, tread of steps and landing on 25mm thick bed of cement mortar 1:6 (1 cement : 6 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of tiles, including rubbing and polishing complete with precast tiles of:		
12.32.1	Light shade using white cement	sqm	698.00
12.32.2	Medium shade using approximately. 50% white cement and 50% ordinary cement.	sqm	673.00
12.32.3	Dark shade using ordinary cement	sqm	629.00
12.33	Extra if Terrazo tiles are laid in treads or steps not exceeding 30 cm. in width	sqm	17.00
12.34	Precast Terrazzo tiles 22mm thick with marble chips of size upto 6mm in skirting and risers of steps and exceeding 30cm in height on 12mm thick cement plaster 1:3 (1 cement : 3 coarse sand) jointed with neat		

Code No	Description	Unit	Rate Rs.
	cement slurry including rubbing and polishing complete with tiles of.		
12.34.1	Light shade using white cement	sqm	708.00
12.34.2	Medium shade using approximately. 50% white cement and 50% ordinary cement.	sqm	682.00
12.34.3	Dark shade using ordinary cement	sqm	657.00
12.35	Extra if cut tiles other than half tiles are used in risers of steps skirting and dado.	sqm	27.00
12.36	Chequered terrazzo tiles 22 mm thick with graded marble chips of size upto 6mm in floors on 25mm thick bed of cement mortar 1:6 (1 cement : 6 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of tiles including grinding rubbing and polishing complete.		
12.36.1	Light shade using white cement	sqm	799.00
12.36.2	Medium shade using approximately. 50% white cement and 50% ordinary cement.	sqm	713.00
12.36.3	Dark shade using ordinary cement	sqm	669.00
12.37	Chequerred precast cement concrete tiles 22mm thick in footpath & courtyard jointed with neat cement slurry mixed with pigment to match the shade of tile including cleaning of joint etc complete on 20 mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand) :		
12.37.1	Light shade using white cement	sqm	640.00
12.37.2	Medium shade using approximately. 50% white cement and 50% ordinary cement.	sqm	591.00
12.37.3	Dark shade using ordinary cement	sqm	518.00
12.37.4	Ordinary cement without any pigment	sqm	514.00
12.38	15mm thick Marble stone slab flooring over 18mm (Average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry including grinding rubbing and polishing etc. complete. (Area of slab should be 0.50 sqm and above)		
12.38.1	Makrana white second quality.	sqm	3752.00
12.38.2	Raj Nagar plain.	sqm	1728.00
12.38.3	Agaria White	sqm	2442.00
12.38.4	Black Zebra.	sqm	1497.00
12.38.5	Udaipur green marble	sqm	1497.00
12.38.6	Pink plain marble.	sqm	1763.00
12.38.7	Wonder marble.	sqm	2729.00
12.38.8	Katni marble.	sqm	1759.00
12.39	15mm thick Marble stone slab in, tread & risers of steps, skirting, dado, walls and pillars on 12mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) and jointed with grey cement slurry including		

Code No	Description	Unit	Rate Rs.
	matching pigment, rubbing and polishing etc. complete. (single stone is to be used for risers and treads of steps and width of stone for skirting and dado shall be equal to the height of skirting & dado and length of 1.0 M).		
12.39.1	Makrana white second quality.	sqm	3830.00
12.39.2	Raj Nagar plain.	sqm	1806.00
12.39.3	Agaria White	sqm	2520.00
12.39.4	Black Zebra.	sqm	1576.00
12.39.5	Udaipur green marble	sqm	1576.00
12.39.6	Pink plain marble.	sqm	1841.00
12.39.7	Wonder marble.	sqm	2807.00
12.39.8	Katni marble.	sqm	1838.00
12.40	15mm thick Marble stone tile flooring over 18mm (Average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry including grinding rubbing and polishing etc. complete. (Area of tile should be 0.18 sqm and above)		
12.40.1	Makrana white second quality.	sqm	1875.00
12.40.2	Raj Nagar plain.	sqm	965.00
12.40.3	Agaria White	sqm	1269.00
12.40.4	Black Zebra.	sqm	1033.00
12.40.5	Udaipur green marble	sqm	851.00
12.40.6	Pink plain marble.	sqm	973.00
12.41	15mm thick Marble tiles in risers and treads of steps skirting dado and pillars laid on 12mm (Average) thick base of cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry including rubbing and polishing etc. complete (Area of tiles to be upto 0.18 sqm)		
12.41.1	Makrana white second quality.	sqm	1953.00
12.41.2	Raj Nagar plain.	sqm	1044.00
12.41.3	Agaria White	sqm	1347.00
12.41.4	Black Zebra.	sqm	1111.00
12.41.5	Udaipur green marble	sqm	929.00
12.41.6	Pink plain marble.	sqm	1051.00
12.42	Extra for using white cement slurry instead of grey cement slurry in joints of marble stone flooring or tiles for all thickness	sqm	12.00
12.43	Extra for nosing in marble stone for treads.	metre	81.00
12.44	Extra for nosing in Granite stone for treads.	metre	126.00

Code No	Description	Unit	Rate Rs.
12.45	15 mm thick Table rubbed polished Granite stone slab flooring laid over 20mm (Average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry including rubbing and polishing etc. complete. (Area of slab should be 0.50 sqm and above)		
12.45.1	Granite stone grey/pink	sqm	1796.00
12.45.2	Granite stone black	sqm	2646.00
12.45.3	Granite stone lakha red/ shahi red	sqm	4200.00
12.46	15 mm thick Table rubbed polished Granite stone slab in risers and treads of steps skirting dado and pillars laid on 12mm (Average) thick base of cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry including rubbing and polishing etc. complete (single stone is to be used for risers and treads of steps and width of stone for skirting and dado shall be equal to the height of skirting & dado and length of 1.0 m).		
12.46.1	Granite stone grey/pink	sqm	1869.00
12.46.2	Granite stone black	sqm	2719.00
12.46.3	Granite stone lakha red/ shahi red	sqm	4273.00
12.47	8 mm thick Table rubbed polished Granite stone tile flooring laid over 20mm (Average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry including rubbing and polishing etc. complete.		
12.47.1	Granite stone grey/pink	sqm	947.00
12.47.2	Granite stone black	sqm	1329.00
12.47.3	Granite stone lakha red/ shahi red	sqm	2038.00
12.48	8 mm thick Table rubbed polished Granite stone tile in risers and treads of steps skirting dado and pillars laid on 12mm (Average) thick base of cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry including rubbing and polishing etc. complete.		
12.48.1	Granite stone grey/pink	sqm	1019.00
12.48.2	Granite stone black	sqm	1402.00
12.48.3	Granite stone lakha red/ shahi red	sqm	2111.00
12.49	25 mm thick KOTA stone slab flooring over 20mm (Average) thick base of cement mortar 1:4 laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including grinding rubbing and polishing etc. complete (Area of slab to be over 0.20 sqm and upto 0.50 sqm)	sqm	897.00
12.50	KOTA stone slab 25mm thick in risers and treads of steps, skirting dado and pillar laid in 12mm (Average) thick cement mortar 1:3 (1 cement : 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete. (single stone is to be used for riser and treads of steps and the width of stone for skirting and dado shall be equal to the height of skirting/ dado up to length of 1.0 M.)	sqm	990.00

Code No	Description	Unit	Rate Rs.
12.51	Extra for nosing in steps and treads of Kota stone slab.	metre	69.50
12.52	Extra for nosing in steps and treads of red or white rough dressed sand stone.	metre	35.50
12.53	Extra for nosing in steps and treads of red or white fine dressed sand stone.	metre	94.00
12.54	Extra for nosing in steps and treads of red or white fine dressed and rubbed sand stone.	metre	118.00
12.55	Extra for necessary grinding and polishing to get mirror finish on KOTA/ Marble Stone flooring/ steps/ treads instead of normal grinding and polishing.	sqm	263.00
12.56	25mm thick Local RAJIM/ Red Flag stone slab flooring laid over 20mm (Average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid over & jointed with grey cement slurry mixed with pigments to match the shade of the stone i/c grinding, rubbing and polishing.	sqm	516.00
12.57	25mm thick Local RAJIM/ Red Flag stone slab in riser of steps, skirting, dado and pillars laid on 12mm (Average) thick cement mortar 1:4 (1 cement : 4 coarse sand) and joint with grey cement slurry mixed with pigments to match the shade of the slab i/c grinding, rubbing and polishing.	sqm	595.00
12.58	25mm thick un-polished Local RAJIM/ Red Flag stone slab flooring laid over 20mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid over & jointed with grey cement slurry mixed with pigments to match the shade of the stone.	sqm	428.00
12.59	Providing and fixing un-polished 45mm to 50mm thick RAJIM SAND STONE in floors laid on sand bed of average thickness 50mm and pointing with cement mortar 1:3 (1 cement : 3 coarse sand) including finishing complete.	sqm	280.00
12.60	Providing and fixing 20mm thick Jaisalmer stone flooring in any pattern over & including 20mm thick cement mortar bedding in CM 1:6 including cement float and filling joints with white neat cement slurry mixed with pigment to match the shade of stone with all wastage of all material including grinding, finishing, polishing and cleaning etc. complete (Edges and joints of stone are cut neatly so that thickness of joints to be not more than 1.50mm) and i/c cost of all materials, labour and running & hire charges of all machineries required for the work at all heights.	sqm	826.00
12.61	Providing and fixing 20mm thick Jaisalmer stone in skirting, coping, dado tread & risers of steps both sides machine cut over and including 12mm thick cement plaster in CM 1:4 with cost of pigment, cement labour for grinding with cost of all materials & labour etc. complete at all heights.	sqm	925.00
12.62	Extra for flooring of any type of stone/ tiles laid in approved design and pattern (Kite or other complicated).	sqm	86.00
12.63	Extra for laying of any type of stone in flooring in strips:		

Code No	Description	Unit	Rate Rs.
12.63.1	Upto 100 mm width	sqm	43.00
12.63.2	Above 100 mm and upto 150 mm	sqm	28.50
12.64	Providing and laying upto 10mm wide stone strips for pattern in flooring of approved colour and shade of:		
12.64.1	Granite stone	metre	44.50
12.64.2	Jaisalmer stone	metre	21.50
12.65	Providing & laying 60mm thick precast interlocking concrete blocks of approved size (approx 305 sqcm) and shape/ pattern, over 40 mm thick average complete coarse sand bed with joints of 3mm thick filled by fine sand including leveling with surface vibrator, temping and sweeping etc. complete of minimum compressive strength of 250 kg/sq.cm		
12.65.1	Plain/ normal coloured precast interlock concrete block	sqm	436.00
12.65.2	Pigment Coloured (rubber mould) precast interlock concrete blocks	sqm	632.00
12.66	Providing and fixing precast compressed plain cement concrete edge restraint block of size 500mmx250mmx60mm of compressive strength of 200kg per sq.cm manufactured by electro hydraulically operated block machine by excavated trench of 150mm depth, laid width wise etc. complete	metre	169.00
12.67	Providing and laying brush concrete flooring of 12mm thick cement concrete (1 cement :2 black metal, 6mm size) mixed with granite pigment of approved quality in a ratio of 2.08 kg/sq metre are laid over & including a base of 40mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm size) with 12.50 mm size graded B.T metal mechanically mixed including neat cement finish over granite with red colour pigment including glass strip of size 45x3 mm, cost of all material & labor etc. complete.	sqm	464.00
12.68	25mm wooden planking tongued and grooved in flooring including fixing with iron screws complete with:		
12.68.1	Teak wood	sqm	3423.00
12.68.2	Other than teak wood such as sal, haldoo and Bija	sqm	1959.00
12.69	38 mm thick parquet (wood blocks) flooring of teak wood laid over 25mm thick leveling layer of cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10mm nominal size) to be paid separately coated with thin layer of hot bitumen (blown type) @ 2.45 kg/ sqm including fixing blocks after dipping in hot bitumen (blown type) upto half depth planned, leveled, smooth and finished complete.	sqm	6233.00*
12.70	Extra for plaining the lower surface of wooden planking	sqm	48.00
12.71	Providing and fixing 2mm thick homogeneous polyvinyl chloride sheet in flooring and skirting in approved pattern on a smooth and damp proof base using rubber based adhesive @ 0.25 kg per sqm of approved quality and manufacturer like Dunlop S-758, Fevicol SR 998 or equivalent including rolling with light wooden roller weighting about 5 kg. all complete in approved colour and shade.	sqm	506.00

Code No	Description	Unit	Rate Rs.
12.72	Providing and fixing in position homogeneous P.V.C. quartz reinforced floor covering tiles conforming to I.S. 3462/1986 of size 300x300 mm over existing smooth and finished surface including removal of dust etc. from existing floor and laying approved adhesive (Dunlop S- 758, Fevicol SR 998 or equivalent) at the rate of 0.25 kg/ sqm including rolling with light wooden roller weighing about 5 kg etc. complete.		
12.72.1	1.6mm thick tiles (weight 3 kg per sqm)	sqm	490.00
12.72.2	2.0 mm thick tiles (Weight 3.80 kg per sqm)	sqm	554.00
12.72.3	3 mm thick tiles (Weight 6 kg per sqm)	sqm	776.00
12.73	Dry brick on edge flooring in required pattern with bricks of class designation 3.5 on a bed of 12 mm mud mortar including filling joints with fine sand complete.	sqm	352.00

Note * **These items are to be executed only with prior permission of Chief Engineer**

13.0 MARBLE & STONE WALL LINING WORK

Unless and otherwise specified in the nomenclature of the item, the marble slabs used for wall lining/veneer work shall be gang saw cut (polished & machine cut).

Back shall not be polished/ cut in order to ensure a good grip with the hearting of backing. The cut slabs shall be of the thickness as specified with a tolerance permissible under para 8.2 above. The tolerance in wall lining when straight edge of 3 m length is placed should not be more than 2 mm.

A) PROPERTIES OF STONE FOR WALL LINING

Stone to be used in wall lining shall be hard, sound, dense, homogeneous and of uniform texture. It shall be uniform in uniform in colour pattern 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.

B) CLASSIFICATION OF MARBLE

The marble blocks, slabs and tiles shall be classified broadly in the following two categories :

(i) White Marble

(ii) Coloured Marble such as black, green, pink, brown, grey marble etc.

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

C) DRESSING AND RUBBING

Every stone for wall veneering shall be cut to the required size and shape, chisel dressed 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 such that a straight edge laid along the face of the stone is in contact with every point on it. 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.

D) MORTAR The mortar used for jointing shall be as specified.

F) LAYING

(i) 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 stone 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.

(ii) Where so desired, the adjoining stones shall be secured to each other by means of copper pins 75 mm long and 6 mm diameter or as specified.

(iii) The stones shall be secured to the backing by means of cramps. The material for cramps shall have high resistance to corrosion under conditions of dampness and against the chemical action of mortar or concrete in which cramps are usually embedded as per CPWD specifications.

(iv) If wall lining work is to be executed upto sill level, then the height will be covered in single stone only.

(v) Clamps: The clamps shall be counted in number and the weight will be worked out by multiplying the quantity to average weight of clamps recorded.

G) CURING

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

H) MEASUREMENTS

For plain work : Measurements shall be taken correct to a cm. in length and breadth and correct to 0.5 cm. in thickness

I) RATE:

The rates include cost of all materials, labour, T & P, wastages, water for curing, hire & running charges of all type of machineries required and all lead & lifts of all materials and operations etc. complete

13.0 MARBLE & STONE WALL LINING WORK

Code No	Description	Unit	Rate Rs.
13.1	15 mm thick Marble work (machine cut, table rubbed & polished) for wall lining (veneer work) in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) mixed with matching pigment. (Area of slab should be over 0.5 sqm)		
13.1.1	Makrana white second quality.	sqm	3831.00
13.1.2	Raj Nagar plain.	sqm	1894.00
13.1.3	Agaria White	sqm	2578.00
13.1.4	Black Zebra.	sqm	1671.00
13.1.5	Udaipur green marble	sqm	1671.00
13.1.6	Pink plain marble.	sqm	1925.00
13.1.7	Wonder marble.	sqm	2852.00

Code No	Description	Unit	Rate Rs.
13.1.8	Katni marble.	sqm	1925.00
13.2	8 mm thick Marble tile work (machine cut, table rubbed & polished) for wall lining (veneer work) in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) mixed with matching pigment.		
13.2.1	Makrana white second quality	sqm	2104.00
13.2.2	Raj Nagar plain	sqm	1194.00
13.2.3	Agaria White	sqm	1497.00
13.2.4	Black Zebra	sqm	1255.00
13.2.5	Udaipur green marble	sqm	1073.00
13.2.6	Pink plain marble	sqm	1194.00
13.3	15 mm thick Marble work (machine cut, table rubbed & polished) for kitchen platform, vanity counters, window sills and similar locations of required size laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) including joints treated with white cement mixed with matching pigment including rubbing and polishing to edge moulding to give high gloss finish.		
13.3.1	Makrana white second quality.	sqm	3870.00
13.3.2	Raj Nagar plain.	sqm	2022.00
13.3.3	Agaria White	sqm	2674.00
13.3.4	Black Zebra.	sqm	1808.00
13.3.5	Udaipur green marble	sqm	1808.00
13.3.6	Pink plain marble.	sqm	2051.00
13.3.7	Wonder marble.	sqm	2936.00
13.3.8	Katni marble.	sqm	2051.00
13.4	15mm thick Granite work (machine cut, table rubbed & mirror polished) for wall lining (veneer work) in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with cement mortar 1:2 (1 white cement: 2 marble dust) mixed with matching pigment. (Area of slab should be over 0.5 sqm).		
13.4.1	Granite stone grey/pink	sqm	1958.00
13.4.2	Granite stone black	sqm	2771.00
13.4.3	Granite stone lakha red/ shahi red	sqm	4258.00
13.5	8mm thick Granite tile work (machine cut, table rubbed & mirror polished) for wall lining (veneer work) in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with cement mortar 1:2 (1 white cement : 2 marble dust) mixed with matching pigment.		
13.5.1	Granite stone grey/pink	sqm	1328.00
13.5.2	Granite stone black	sqm	1710.00
13.5.3	Granite stone lakha red/ shahi red	sqm	2420.00

Code No	Description	Unit	Rate Rs.
13.6	15mm thick Granite work (machine cut, table rubbed & mirror polished) for kitchen platform, vanity counters, window sills and similar locations of required size laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) including joints treated with white cement mixed with matching pigment including rubbing and polishing to edge moulding to give high gloss finish.		
13.6.1	Granite stone grey/pink	sqm	2466.00
13.6.2	Granite stone black	sqm	3279.00
13.6.3	Granite stone lakha red/ shahi red	sqm	4766.00
13.7	Stone work with DHOLPUR SAND STONE (machine cut edge) exposed face fine dressed with rough backing for wall lining etc. (Veneer work) upto 10 metre height, 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 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 separately)		
13.7.1	40mm. thick	sqm	1723.00
13.7.2	50mm. thick	sqm	1890.00
13.7.3	60mm. thick	sqm	2067.00
13.8	Stone work with DHOLPUR SAND STONE (machine cut edge) exposed face machine cut and table rubbed with rough backing for wall lining etc. (Veneer work) upto 10 metre height, backing filled with a grout of 20 mm thick cement mortar 1:3 (1 cement : 3 coarse sand), including pointing in white cement mortar 1:2 (1 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 separately)		
13.8.1	40mm. thick	sqm	2054.00
13.8.2	50mm. thick	sqm	2221.00
13.8.3	60mm. thick	sqm	2414.00
13.9	Stone work with KOTA STONE Slab (machine cut edge) exposed face machine cut and table rubbed with rough backing for wall lining etc. (Veneer work) upto 10 metre height, backing filled with a grout of 20 mm thick cement mortar 1:3 (1 cement: 3 coarse sand), jointing with cement mortar 1:2 (1 cement: 2 stone dust) with admixture of pigment matching the stone shade including rubbing and polishing complete. (To be secured to the backing by means of cramps which shall be paid separately)		
13.9.1	25mm thick	sqm	1026.00
13.9.2	40mm thick	sqm	1145.00
13.10	Stone tile work (mirror polished, machine cut edge) for wall lining upto 10 metre height, with special adhesive over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), including pointing in white cement mortar 1:2 (1 cement : 2 marble dust) with an admixture of pigment matching the stone shade.		
13.10.1	Granite Stone of any colour and shade - 8mm thick	sqm	1331.00

Code No	Description	Unit	Rate Rs.
13.10.2	White/green/black marble - 8mm thick	sqm	1153.00
13.10.3	Mica/ White stone - 10-20mm thick	sqm	680.00
13.11	Wall lining butch work upto 10m height with DHOLPUR STONE rough facing on the exposed surface with strips of 40 mm thick, 300mm (minimum) length and required width over 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand), embedding every tenth layer and bottom most layer of 75mm thick strips in masonry or concrete after making necessary chases of size 75mmx75mm, ruled pointing in white cement mortar 1:2 (1 cement : 2 stone dust) with an admixture of pigment matching the stone shade.	sqm	1717.00
13.12	Providing and fixing dry cladding upto 10 metre heights with 30mm thick gang saw cut DHOLPUR SAND STONE (machine cut edges) of uniform colour and size upto 1mx1m size, fixed to structural steel frame work and/ or with the help of cramps, pins etc. and sealing the joints with weather sealant. (The steel frame work, stainless steel cramps and pins etc. shall be paid for separately.)	sqm	1803.00
13.13	Extra for stone work (Veneer work) curved on plan with a mean radius not exceeding 6.0m.	sqm	57.50
13.14	Extra for stone work for wall lining on exterior wall beyond 10m height from ground level for every additional height of 3 metre or part thereof.	sqm	128.00
13.15	Providing and fixing clamps of required size and shape for anchoring stone wall lining to the baking or securing adjacent stone in stone wall lining in cement mortar 1:2 (1 cement : 2 coarse sand) including making the necessary chases and/or holes in stone/wall.		
13.15.1	Gun metal cramps size 25mm x 6mm x 300mm	kg	132.00
13.15.2	Stainless steel cramps with stainless steel nuts and bolts and washer (total weight not less than 260 gms).	kg	393.00
13.16	Providing and fixing structural steel frame (for dry cladding of sand stone) on walls at all heights using M.S. square/ rectangular tube in the approved pattern 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 grade 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) of size 300x230x300mm and with approved expansion hold fasteners on CC/RCC surface including drilling necessary holes, 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 and painted with two or more coats of epoxy paint. (Stainless steel cramps shall be paid separately)	kg	118.00
13.17	Providing and fixing 15mm thick Granite (machine cut, table rubbed & mirror polished on both sides) for partition curtain in toilets or similar locations of required size in wall with cement mortar 1:4 (1 cement : 4 coarse sand) including cutting chase in wall and joint with wall treated with white cement mixed with matching pigment including rubbing and polishing to edge moulding to give high gloss finish.		
13.17.1	Granite stone grey/pink	sqm	2111.00

Code No	Description	Unit	Rate Rs.
13.17.2	Granite stone black	sqm	2924.00
13.17.3	Granite stone lakha red/ shahi red	sqm	4410.00
13.18	Providing and fixing copper pins 7.5 cm. long 6mm dia. for securing adjacent stone wall lining in cement mortar 1:2 (1 cement : 2 coarse sand) including making necessary chases.	each	27.00
13.19	Extra for providing edge moulding to 15mm thick stone counters, vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.		
13.19.1	Marble work	metre	103.00
13.19.2	Granite work	metre	172.00
13.20	Extra for fixing marble /granite stone in facia and drops of width upto 150 mm with epoxy resin based adhesive instead of cement mortar including cleaning etc. complete.	metre	257.00
13.21	Extra for making opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including making necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete.	each	253.00
13.22	Mirror polishing on marble work/ Kota stone/ Granite work where ever required to give high gloss finish complete.		
13.22.1	On walls/ Floor	sqm	184.00
13.22.2	On kitchen platform, sills and similar	sqm	207.00
13.23	Providing and fixing (Table Rubbed & polished) 30mm thick jali throughout (without sunk or moulded in jali slab) in white cement mortar 1:2 (1 white cement : 2 marble dust) with and admixture of pigment to match the marble shade, jali pattern to be cut square to jali slab without any chamfers as per drawings & designs and patterns approved by the Engineer-in-charge.		
13.23.1	Makrana white second quality.	sqm	9283.00
13.23.2	Raj Nagar plain.	sqm	5125.00
13.23.3	Agaria White	sqm	7065.00
13.23.4	Black Zebra.	sqm	4848.00
13.23.5	Udaipur green marble	sqm	4848.00
13.23.6	Pink plain marble.	sqm	5402.00
13.24	Providing and fixing one side polished 25 mm thick RAJIM SAND STONE shelves fixed in walls in cement mortar 1:3 (1 cement : 3 coarse sand) including finishing complete.		
13.25	One side polished	sqm	331.00
13.25	Both side polished	sqm	414.00

14.0 DISTEMPERING, PAINTING AND FINISHING

A) MATERIAL

The following materials shall be used for finishing work:

i) Class C lime i.e. fat lime shall be used for white washing,.

ii) The colouring material shall be of approved make and as approved by Engineer-in-Charge for colour wash.

iii) Dry distemper shall conform to I.S. 427-1965

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

v) Cement paint shall conform to I.S. 5410-1969.

vi) Primer on wooden surfaces shall be ready to mixed primer conforming to I.S 3536.

vii) Primer on metal steel surfaces shall be done with red oxide zinc chromate conforming to IS 2074.

viii) Synthetic enamel paint shall conform to I.S. 2932 -1974, IS 2933-1975 and IS 133-1975

ix) Ready mixed paints shall conform to I.S. 3631-1966.

x) Clear synthetic varnish shall conform to IS 525-1968

xi) Copal varnish shall conform to I.S. 337-1975.

xii) Wax polishing shall be done with ready made wax polish.

xiii) The other paints should conform to the following specifications:

a)	Aluminium paint	-	IS 2339-1963
b)	Black Japan	-	IS 341-1968
c)	Anti corrosive Bituminous	-	IS 158-1969
d)	Plastic emulsion paint	-	IS 5411-1974
e)	French polish	-	IS 348-1968
f)	Turpentine	-	IS 533-1973.
g)	Double boiled linseed oil	-	IS 77-1968
h)	Acrylic exterior paint	-	As per manufacturer specification.
i)	Textured paint	-	As per manufacturer specification.
j)	Oil type wood preservative	-	IS:218.

B) PREPARATION OF SURFACE

i) New Work

The surface shall be thoroughly brushed to remove the mortar droppings and foreign matter before the work to be executed. New plastered surfaces shall be allowed to dry completely, before applying, distemper/ primer/ paint etc.

All the rust, dirt, scales, smoke splashes, mortar dropping and grease shall be thoroughly removed from the surface for painting work.

The surface shall be cleaned and all unevenness shall be rubbed down smooth with sand paper and well dusted for polishing work. Knots if visible shall be covered with a preparation of red lead and glue. Holes and indentations on the surface shall be stopped with glazier's putty.

ii) Old Work

All loose particles and scales shall be scrapped off and holes in plaster as well as patches of less than 50 sq.cm. area shall be filled up with mortar of the same mix.

All loose pieces and scales shall be removed by sand papering. The surface shall be cleaned of all grease, dirt etc. Pitting in plaster shall be made good with Plaster of Paris mixed with the color to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth. A coat of the finishing item shall be applied over the patches. The patched surface shall be allowed to dry thoroughly before the regular coat of finishing item.

If the old polished surface is not much soiled then it shall be cleaned of grease and dirt by rubbing with turpentine and then rubbed with fine sand paper. If the old polished surface is much soiled then it will be necessary to remove the entire polish and the work will be executed as new work.

C) SCAFFOLDING

Wherever scaffolding is necessary, it shall be erected on double supports tied by horizontal pieces, over which scaffolding planks shall be fixed. No ballies, bamboos or planks shall rest on or touch the surface which is being finished. Where ladders are used, pieces of old gunny bags shall be tied on their tops to avoid damage or scratches to walls. For the ceiling, proper stage scaffolding shall be erected.

D) APPLICATION:

The finishing item shall be applied with appropriate brushes/ rollers to the specified number of coats. The operation for each coat shall consist of a stroke of the brush given from the top downwards, another from the bottom upwards over the first stroke, and similarly one stroke horizontally from the right and another from the left before it dries. Each coat shall be allowed to dry before the next one is applied. No portion of the surface shall be left out initially to be patched up later on. The finished dry surface shall not show any signs of cracking and peeling, nor shall it come off readily on the hand when rubbed.

E) PROTECTIVE MEASURES:

Doors, Windows, floors, articles of furniture etc. and such other parts of the building not to be white washed, shall be protected from being splashed upon. Splashings and droppings, if any shall be removed by the contractor at his own cost and the surfaces cleaned. Damages if any to furniture or fittings and fixtures shall be recoverable from the contractor.

F) MEASUREMENT

(i) Length and breadth shall be measured correct to a cm and area shall be calculated in sqm correct to two places of decimals.

(ii) Small articles not exceeding 10 sq. decimetre (0.1 sqm) of painted surfaces where not in conjunction with similar painted work shall be enumerated.

(iii) Painting upto 10 cm in width or in girth and not in conjunction with similar painted work shall be given in running metres and shall include cutting to line where so required.

Note : Components of trusses, compound girders, stanchions, lattices and similar work shall, however, be given in sq. metres irrespective of the size or girth of members. Priming coat of painting shall be included in the work of fabrication.

(iv) In measuring painting, varnishing, oiling etc. of joinery and steel work etc. The coefficients as indicated in following table shall be used to obtain the area payable. The coefficients shall be applied to the areas measured flat and not girthed.

Equivalent Plain Areas of Uneven Surface

S. No.	Description of work	How to measured	Multiplying Coefficients
1	2	3	4
I. Wood work doors, windows Etc.			
1	Paneled or framed and braced doors, windows etc.	Measured flat (not girthed including)	1.30 (for each side)
2	Ledged and battened or ledged battened and braced doors, windows etc.	Chowkhat or frame, Edges, chocks, cleats, etc. shall be deemed to be included in the item.	, - do -
3	Flush doors etc.	- do -	1.20 (for each side)
4	Part paneled and part glazed or gauzed doors, window etc. (Excluding painting of wire gauze portion)	- do -	1.00 (for each side)
5	Fully glazed or gauzed doors, windows etc. (Excluding painting of wire gauze portion)	- do -	0.80 (for each side)
6	Fully venationed or louvered	- do -	1.80 (for each side)
7	Trellis (or Jaffri) work one way or two way	Measured flat overall, no deduction shall be made for open spaces,supporting members shall not be measured separately	2 (for painting all over)
8	Carved or enriched work	Measured flat	2 (for each side)
9	Weather boarding	Measured flat (not girthed supporting frame work shall not be measured separately	1.20 (for each side)
10	Boarding with cover fillets and match boarding	Measured flat (not girthed)	1.05 (for each side)
11	Wood shingle roofing	- do -	1.10 (for each side)
12	Tile and slate battening	Measured flat overall no deductions shall be made for open spaces	0.80 (for painting all over)
II. Steel work doors, windows Etc			
13	Plain sheeted steel doors or windows	Measured flat (not girthed) including frame edges etc	1.10 (for each side)
14	Fully glazed or gauzed steel doors and windows (excluding painting of wire gauze portion)	-do-	0.50 (for each side)
15	Partly paneled and partly glazed or gauzed doors and windows (excluding painting of wire gauze portion)	-do-	0.80 (for each side)
16	Corrugated sheeted steel doors or windows	-do-	1.25 (for each side)

S. No.	Description of work	How measured	Multiplying coefficients
17	Collapsible gates	Measured flat	1.50 (for painting all over)
18	Rolling shutters of interlocked	Measured flat (size of opening) all over; jamb guides, bottom rails and locking arrangement etc. shall be included in the item (top cover shall be measured separately)	1.10 (for each side)
III. General			
19	Expanded metal, hard drawn steel wire fabric of approved quality, grill works and gratings in guard bars, balustrades, railing partitions and MS Bars in windows frames.	Measured flat overall; no deduction shall be made for open spaces; supporting members shall not be measured separately	1 (for Paint all over)
20	Open palisade fencing and gates including standards, braces, rails stays etc. in timber or steel	-do- (see note No. 12)	1 (for Paint all over)
21	Corrugated iron sheeting in roofs, side cladding etc.	-do- Measured flat (no girthed)	1.14 (for each side)
22	AC corrugated sheeting in roofs, side cladding etc.	-do-	1.20 (for each side)
23	AC semi corrugated sheeting in roofs, side cladding etc. or Nainital pattern using plain sheets	-do-	1.10 (for each side)
24	Wire gauze shutters including painting of wire gauze	-do-	1.00 (for each side)

(iv) The length shall be measured over the finished line of pipe including special etc. in running metre, correct to a cm.

(v) In case of sponge/ sand faces (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.

G) RATES:

The rates in this chapter are for all location like walls, ceiling, sloping roofs and in all floors and height 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.

Code No	Description	Unit	Rate Rs.

Code No	Description	Unit	Rate Rs.
14.1	Providing and applying plaster of paris putty over plastered wall surface including scaffolding complete		
14.1.1	Upto 2 mm thickness to make surface even and smooth in line and level.	sqm	63.00
14.1.2	More than 2 mm thickness to make surface even and smooth in true plumb and line and level.	sqm	93.50
14.2	Providing and applying plaster of paris putty over plastered ceiling surface including scaffolding complete.		
14.2.1	Upto 2 mm thickness to make surface even and smooth in line and level.	sqm	66.00
14.2.2	More than 2 mm thickness to make surface even and smooth in true plumb and line and level.	sqm	85.00
14.3	Providing and making plaster of paris moulding bend in approved pattern in ceiling / wall in line and level including scaffolding complete.		
14.3.1	Upto 50 mm width and 10mm thick	metre	18.50
14.3.2	Above 50 mm and upto 100 mm width and 10mm thick	metre	25.50
14.4	Preparation of wall surface by applying a coat of putty comprising of chalk mitti, varnish and white lead in ratio 2½:1:1 (2½ kg chalk mitti : 1 litre varnish : 1 kg white lead) respectively, sand papering and making the surface smooth to proper shape and presentable conditions.	sqm	35.00
14.5	White washing with lime to give an even shade.		
14.5.1	On new work (Three or more coats)	sqm	9.40
14.5.2	On old work (Two or more coats)	sqm	5.50
14.5.3	On old work (one coats)	sqm	3.20
14.6	White washing with whiting to give an even shade.		
14.6.1	On new work (Three or more coats)	sqm	9.00
14.6.2	On old work (Two or more coats)	sqm	5.30
14.6.3	On old work (one coats)	sqm	3.00
14.7	Colour washing such as green, blue or buff with lime to give an even shade.		
14.7.1	On new work (two or more coats) including a base coat of white washing	sqm	12.00
14.7.2	On old work (Two or more coats)	sqm	5.60
14.7.3	On old work (one coats)	sqm	3.20
14.8	Hiramchi colour wash to give and even shade.		
14.8.1	On new work (Two or more coats)	sqm	5.00
14.8.2	On old work (one coats)	sqm	2.90
14.9	Distempering with acrylic washable distemper to give an even shade.		
14.9.1	On new work (Two or more coats)	sqm	38.00
14.9.2	On old work (one or more coats)	sqm	17.50

Code No	Description	Unit	Rate Rs.
14.10	Wall painting with acrylic premium emulsion (plastic) paint of required shade to give an even shade.		
14.10.1	On new work (two or more coats)	sqm	44.50
14.10.2	On old work (one or more coats)	sqm	28.50
14.11	Wall painting with acrylic luxury emulsion (plastic) paint of required shade to give an even shade.		
14.11.1	On new work (two or more coats)	sqm	52.50
14.11.2	On old work (one or more coats)	sqm	33.50
14.12	Applying one coat of cement primer on wall surface (applied @ 0.80 litrs/10 sqm) complete.	sqm	23.00
14.13	Providing and applying 2mm thick ready mix exterior grade approved make putty (like Birla wall care, Alltek Superfine W/R of (NCL), Asian, ICI, Nerolac, J.K. wall putty) on walls to make the surface smooth and even.	sqm	94.50
14.14	Finishing walls with water proofing cement paint of required shade to give an even shade.		
14.14.1	On new work (Two or more coats applied @ 3.84 kg/10 sqm)	sqm	41.00
14.14.2	On old work (one or more coats applied @ 2.20 kg/10 sqm)	sqm	25.50
14.15	Painting exterior surface with ACRYLIC SMOOTH exterior paint of required shade as per manufacturer's specifications to give protective and decorative finish including cleaning washing of surface etc. complete with:		
14.15.1	On new work (Two or more coats applied @ 1.43 ltr/ 10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm)	sqm	56.00
14.15.2	On old work (One or more coats applied @ 0.83 ltr/ 10 sqm)	sqm	37.00
14.16	Painting exterior surface with PREMIUM ACRYLIC SMOOTH exterior paint of required shade as per manufacturer's specifications to give protective and decorative finish including cleaning washing of surface etc. complete with:		
14.16.1	On new work (Two or more coats applied @ 1.43 ltr/ 10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm)	sqm	74.50
14.16.2	On old work (One or more coats applied @ 0.83 ltr/ 10 sqm)	sqm	47.50
14.17	Painting exterior surface with TEXTURED exterior paint of required shade as per manufacturer's specifications to give protective and decorative finish including cleaning washing of surface etc. complete with:		
14.17.1	On new work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/ 10 sqm	sqm	140.00
14.17.2	On old work (One or more coats applied @ 1.82 ltr/ 10 sqm)	sqm	78.50
14.18	Providing and applying synthetic/ acrylic plaster giving protective layer and decorative finish on any surface in approved design and shade as per manufacturer's specifications:		
14.18.1	2.0mm thickness (average) having design scratched with special rollar.	sqm	410.00*

Code No	Description	Unit	Rate Rs.
14.18.2	1.5mm thickness (average) having spray coat finish with special rollar.	sqm	389.00*
14.18.3	300 micron thickness (average) having superfine finish.	sqm	297.00*
14.19	Finishing with epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including priming coat with epoxy primer, preparation of surface, etc. complete.	sqm	131.00
14.20	Applying priming coat on wood work with ready mixed primer.	sqm	23.50
14.21	Applying priming coat on steel work with red oxide zinc chromate primer.	sqm	17.50
14.22	Painting on new work (two or more coats) to give an even shade with:		
14.22.1	Satin synthetic enamel paint	sqm	55.00
14.22.2	Premium synthetic enamel paint	sqm	47.00
14.22.3	Aluminium paint	sqm	58.50
14.22.4	Black anti-corrosive bitumastic paint	sqm	38.50
14.22.5	Black Japan paint	sqm	39.00
14.23	Painting on old work (one or more coats) to give an even shade with:		
14.23.1	Satin synthetic enamel paint	sqm	35.00
14.23.2	Premium synthetic enamel paint	sqm	30.00
14.23.3	Aluminium paint	sqm	37.00
14.23.4	Black anti-corrosive bitumastic paint	sqm	25.00
14.23.5	Black Japan paint	sqm	25.50
14.24	Extra for painting with spray painting machine instead of paint brush:		
14.24.1	On new work	sqm	5.00
14.24.2	On old work	sqm	2.20
14.25	Providing and laying French sprit polish on new wood work after preparing the surface by rubbing down smooth with sand papers, covering the knots, if visible, applying a coat of wood filler, cleaning the surface, applying 50 or more coats of French spirit polish till the surface gives high gloss.	sqm	143.00
14.26	Providing and laying French sprit polish on old wood work after preparing the surface by washing all dust, dirt and greasiness with detergent, rubbing down smooth with sand papers, covering the knots or undulations by applying a coat of wood filler if required, cleaning the surface, applying 5 or more coats of French spirit polish till the surface gives high gloss.	sqm	59.50
14.27	Providing and laying Melamine polish on new wood work (two or more coats) with spray machine after preparing surface by rubbing down smooth with sand papers, preparation of surface, applying 5 to 10 coats of French sprit polish, applying two coats of Melamine sealer and finally applying two coats of Melamine clear as per manufacturers specifications complete:	sqm	469.00*

Code No	Description	Unit	Rate Rs.
14.28	Providing and laying PU polish on new wood work (two or more coats) with spray machine after preparing surface by rubbing down smooth with sand papers, preparation of surface, applying 5 to 10 coats of French sprit polish, applying two coats of PU sealer and finally applying two coats of PU clear as per manufacturers specifications complete:	sqm	656.00*
14.29	Applying priming coat with ready mixed primer on small articles not exceeding 0.10 sqm in area not in conjunction to similar primer painted work.	each	4.30
14.30	Painting small articles not exceeding 0.10 sqm of painted surface with superior quality enamel paint, not in conjunction to similar painted work.	each	5.10
14.31	Applying priming coat with ready mixed primer on surface upto 15 centimetre width or girth not in conjunction to similar painted work..	each	6.40
14.32	Painting small articles upto 15 cm in width or girth with superior quality enamel paint, not in conjunction to similar painted work.	each	7.60
14.33	Applying priming coat with ready mixed primer on picture or curtain rail.	metre	6.10
14.34	Painting (one or more coats) on picture or curtain rail with superior quality enamel paint to give an even shade.	metre	7.20
14.35	Floor painting with superior quality enamel paint to give an even shade.		
14.35.1	On new work (two or more coats)	sqm	43.00
14.35.2	On old work (one or more coats)	sqm	25.50
14.36	Flooring polishing with superior quality wax polish of approved brand and manufacture.	sqm	26.50
14.37	Painting with black anticorrosive bitumastic paint on new work (two or more coats) on rain water, soil waste, vent pipes and fittings:		
14.37.1	50 mm diameter pipes.	metre	8.10
14.37.2	75 mm diameter pipes.	metre	11.00
14.37.3	100 mm diameter pipes	metre	14.50
14.37.4	150 mm diameter pipes	metre	21.00
14.38	Painting with black anticorrosive bitumastic paint on old work (one or more coats) on rain water, soil waste, vent pipes and fittings:		
14.38.1	50 mm diameter pipes.	metre	4.90
14.38.2	75 mm diameter pipes.	metre	6.90
14.38.3	100 mm diameter pipes	metre	8.90
14.38.4	150 mm diameter pipes	metre	13.50
14.39	Painting with aluminium paint on new work (two or more coats) on rain water, soil waste, vent pipes and fittings over and including a priming coat of red oxide zinc chromate primer:		
14.39.1	50 mm diameter pipes.	metre	14.50
14.39.2	75 mm diameter pipes.	metre	20.50

Code No	Description	Unit	Rate Rs.
14.39.3	100 mm diameter pipes	metre	26.00
14.39.4	150 mm diameter pipes	metre	39.00
14.40	Painting with aluminium paint on old work (one or more coats) on rain water, soil waste, vent pipes and fittings		
14.40.1	50 mm diameter pipes.	metre	4.90
14.40.2	75 mm diameter pipes.	metre	9.20
14.40.3	100 mm diameter pipes	metre	8.90
14.40.4	150 mm diameter pipes	metre	18.00
14.41	Lettering with black Japan paint, per cm height.	per letter	0.70
14.42	Re-Lettering with black Japan paint, per cm height.	per letter	0.50
14.43	Coal tarring two coats on new work using 0.16 and 0.12 litre coal tar per sqm in the first and second coat respectively.	sqm	20.50
14.44	Removing white or colour wash by scrapping, sand papering and preparing the surface smooth including necessary repair to scratches etc. complete.	sqm	4.30
14.45	Removing dry or oil bound distemper by scraping sand papering and preparing the surfaces smooth including necessary repair to scratches etc. complete.	sqm	5.20
14.46	Removing old paint or polish by paint remover or blow lamp or any other means as approved including preparing the surface smooth after removing the paint.	sqm	32.50
14.47	Coal tarring one coat on old work using 0.12 litre coaltar per sqm	sqm	30.50

Note * **These items are to be executed only with prior permission of Chief Engineer**

15.0 PILE WORK

A) TERMINOLOGY

(i) **Allowable 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.

(ii) **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 or batter pile. It may be 'End bearing pile' or friction pile if it supports the load primarily along the surface.

(iii) **Bored Compaction Pile:** It is bored cast-in-situ withy or without bulb. In this compaction of surrounding ground and freshly filled concrete in pile, bore is simultaneously achieved by suitable method. A pile with a bulb is called an "under-reamed bored compaction pile". Under-reamed pile with more then bulb is called Multi- under-reamed pile.

(iv) **Constant Rate of Penetration (CRP) Test:** The ultimate bearing capacity of preliminary piles and piles which are not used as working piles.

(v) **Constant Rate of Uplift (CRU) Test:** The ultimate capacity in tension of preliminary piles and piles which are not used as working piles.

(vi) **Cut-off Level:** It is the level where the installed pile is cut off to support the pile caps or beams.

(vii) **Datum Bar:** A rigid bar placed on immovable supports.

(viii) **Draft Bolt:** A metal rod driven into hole bored in timber, the hole being smaller in diameter than the rod.

(ix) **Drop or stroke:** The distance through which the driving weight is allowed to fall for driving the piles.

(x) **Factor of safety:** It is the ratio of the ultimate load capacity of a pile to the safe load of a pile.

(xi) **Follower Tube:** A tube which is used following the main casing tube and it requires to be extended further. The inner diameter of the follower tube should be the same as the inner diameter of casing. The follower tube shall preferably be an outside guide and should be water tight when driven in water bearing strate or soft clays.

(xii) **Initial Test :** This test is carried with a view to determine ultimate load capacity and safe load capacity.

(xiii) **Raker or batter pile:** The pile which installed at an angle to the vertical. Raker piles are normally provided where vertical piles cannot resist the required applied horizontal forces. The maximum rake to be permitted in piles shall not exceed-
1 in 8 for cast-in-situ piles of large diameter viz. 750 mm dia. and above.
1 in 5 for smaller dia. cast-in-situ piles.
1 in 4 for precast piles.

(xiv) **Routing Test:** It is carried out with a view to check whether pile is capable of taking the working load assigned to it.

(xv) **Safe Load:** It is the load arrived at by applying a factor of safety to the ultimate load capacity of the pile.

(xvi) **Set:** The net distance by which the pile penetrates in the ground due to stated number of blows of the hammer.

(xvii) **Spliced Pile:** A pile composed of two or more lengths secured together, end to end to form one pile.

(xviii) **Test Pile:** A pile which is selected for load testing and which is subsequently loaded for that purpose. This pile may form working pile it self if subjected to a routing load test with upto one and half time the safe load.

(xix) **Total Elastic Displacement:** This is the magnitude of the displacement of the pile due to rebound caused at the top after removal of given test load. This comprised two components as follows:

(a) Elastic displacement of the solids participating in load transfer; and
(b) Elastic displacement of the pile shaft.

(xx) **Trial Piles:** These are installed initially to assess the load carrying capacity, it is either ultimate bearing capacity or twice the estimated safe load.

(xxi) **Ultimate load capacity:** The maximum load which a pile can carry before failure of ground (When the soil fails by shear) or failure of pile materials.

(xxii) **Working load:** It is a load assigned to a pile as per design.

(xxiii) **Working pile:** it is pile forming part of foundation of a structural system.

B) LAYING

(1) Driven Cast-in Situ reinforced concrete piles

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 reinforced concrete.

Procedure of Driving Pile Bore

(i) Driven cast-in-situ concrete piles are installed by driving a metal casing with a shoe at the tip/ toe and displacing the material laterally.

(ii) These piles may be cast in metal shells which may remain permanently in place or the casing may be withdrawn which may termed as uncased driven cast-in-situ cement concrete piles.

(iii) The metal casing shall be of sufficient thickness and strength to hold its original form and show no harmful distortion when the adjacent casing is driven and the driving core if any is withdrawn.

(iv) Driven cast-in-situ concrete piles shall be installed using a properly designed detachable shoe at the bottom of the casing.

(v) Any liner or bore hole which is temporarily located and shows partial collapse that would affect the load carrying capacity of the pile, shall be rejected or repaired as directed by the Engineer-in-Charge.

(vi) **Reinforcement:**

a) The design of reinforcing cage varies depending upon the driving and installation conditions, the nature of the sub-soil and the nature of load to be transmitted by the shaft, axial or otherwise. The minimum area of longitudinal reinforcement of any type or grade within the pile shaft shall be 0.4 per cent of the sectional area calculated on the basis of the outside area of the casings of the shaft.

b) Clear cover to all main reinforcement in pile shaft shall be not less than 50 mm and shall be maintained by suitable spacers. The laterals of reinforcing cage may be in the form of links or spirals. The diameter and spacing of the same is chosen to impart adequate rigidity of the reinforcing cage during the handing and installation. The minimum diameter of links or spirals shall be 6 mm and the spacing of the links or spirals shall be not less than 150 mm. The minimum clear distance between two adjacent main reinforcement should normally be 100 mm for full depth of the cage.

c) The reinforcing cage should be left with adequate protruding length above the cut off level for proper embedment in the pile cap. Prior to the lowering of reinforcement cage into the pile shaft, the shaft shall be cleaned of all loose materials.

d) Dowells, curtailment, bond length, spreader forks, lacing etc shall be as per relevant code and CPWD specifications.

Placing of concrete

(i) Before commencement of pouring concrete, it shall be ensured that there is no ingress of water in the casing tubes from bottom. Further, adequate control during withdrawal of the casing tube is essential so as to maintain sufficient head of concrete inside the casing tube at all stages of withdrawal.

(ii) Wherever practicable concrete should be placed in a clean dry hole where concrete is placed in dry hole and when casing is present, the top 3 m pile shall be compacted using internal vibrators. The concrete should invariably be poured through a tremie, with a funnel so that the flow is directed and concrete can be deposited in the hollow without segregation. Care shall be taken during concreting to prevent as far as possible the segregation of the ingredients. The displacement or distortion of reinforcement during concreting and also while extracting the tube shall be avoided.

(iii) Where the casing is withdrawn from cohesive soil for the formation of cast-in-situ pile, the concreting should be done with necessary precautions to minimize the softening of the soil by excess water. Where mud flow conditions exist, the casing of cast-in-situ piles shall not be allowed to be withdrawn.

(iv) The concrete shall be self compacting and shall not get mixed with soil, excess water, or other extraneous matter. Special care shall be taken in silty clays and other soils with tendency to squeeze into newly deposited concrete and cause necking. Sufficient head of green concrete shall be maintained to prevent inflow of soil or water into concrete. The placing of concrete shall be a continuous process from the toe level to the top of pole to prevent segregation, a tube of

termite pipe as appropriate shall be used to place concrete in all piles. To ensure compaction by hydraulic static heads, rate of placing concrete in the pile shaft shall not be less than 6 m (length of pile) per hour.

(v) The diameter of the finished pile shall not be less than specified and a continuous record shall be kept by the Engineer as to the volume of concrete placed in relation to the length of pile cast. After each pile has been cast and any empty pile hole remaining shall be protected and back filled as soon as possible with approved material.

(vi) The minimum embedment of cast-in-situ concrete piles into pile cap shall be 150 mm. Any defective concrete at the head of the completed pile shall be cut away and made good with new concrete. The clear cover between the bottom reinforcement in pile cap from top of pile shall not be less than 30 mm. The reinforcement in the pile shall be exposed for full anchorage length to permit it to be adequately bonded into the pile cap. Exposing such length shall be done carefully to avoid damaging the rest of the pile. In cases where the pile cap is to be laid on ground a leveling course with cement concrete Grade M-15 of 100 mm thickness shall be provided

(vii) Normally concreting of piles should be uninterrupted. In exceptional case of interruption of concreting, but which can be resumed within 1 or 2 hours, the tremie shall not be taken out of the concrete; instead it shall be raised and lowered slowly from time to time to prevent the concrete around the pipe from setting. Concreting should be resumed by introducing a little richer concrete with a slump of about 200 mm for easy displacement of the partly set concrete. If the concreting cannot be resumed before final set of concrete already laid, the pile so cast may be rejected or accepted with modifications.

(viii) In case of withdrawal of tremie out of concrete, either accidentally or to remove a choke in the tremie, the tremie may be re-introduced in the following manner to prevent impregnation of laitance of scum lying on the top of the concrete already deposited in the bore.

(ix) The tremie shall be gently lowered on to the old concrete with very little penetration initially. A vermiculite plug should be introduced in the tremie. Fresh concrete of slump between 150 mm and 175 mm should be filled in the tremie which will push the plug forward and will emerge out of the tremie displacing the laitance/ scum. The tremie will be pushed further in steps making fresh concrete squeegee away laitance/ scum in its way. When the tremie is buried by about 60 to 100 cms, concreting may be resumed.

(x) The top of concrete in a pile shall be brought above the cut-off level to permit removal of all laitance and weak concrete before capping and to ensure good concrete at the cut- off level for proper embedment into the pile cap.

(xi) Where cut-off level is less than 1.5 metres below the working level concrete shall be cast to a minimum of 300 m above cut-off level. For each additional 0.3 m increase in cut-off level below the working level additional coverage of 50 mm minimum shall be allowed. Higher allowance may be necessary depending on the length of the pile. When concrete is placed by tremie method concrete shall be cast to the piling platform level to permit overflow of concrete for visual inspection or to a minimum of one metre above cut off level. In the circumstances where cut-off level is below ground water level the need to maintain pressure on the unset concrete equal to or greater than water pressure should be observed and accordingly length of extra concrete above cut-off level shall be determined.

(2) Bored Cast-in-Situ Reinforced Concrete Piles.

(i) The piles formed within the ground by excavating or boring a pile within it with or without the use of temporary casing and subsequently filling it with plain or reinforced concrete. When the casing is left permanently is termed as cased pile and when the casing is taken out it is termed as uncased pile.

(ii) In installing a bored pile the sides of the bore hole (When it does not stand by itself) is required to be stabilized with the aid of temporary casing or with the aid of drilling mud of suitable consistency. For marine situations such piles are formed with permanent casing (Liner.)

Procedure: As per CPWD Specifications

(3) Under – Reamed RCC Piles

Under – reamed piles are bored cast-in-situ and bored compaction concrete types having one or more bulbs formed by suitable enlarging the bore hole for the pile stem. With the provision of bulb (s) substantial bearing or anchorage is available.

These piles find application in widely varying situations in different types of soil where foundations are required to be taken down to a certain depth in view of considerations like the following requirements:

i) To avoid the undesirable effect of seasonal moisture changes an in expansive soil.
ii) To reach firm strata.
iii) To obtain adequate capacity for downward, upward and lateral loads and moments.
iv) To take foundations below scour level.

When the ground consists of expansive soil e.g. black cotton soil, the bulb of the under reamed pile provides anchorage against uplift due to swelling pressure apart from the increased bearing capacity.

In case of filled up or otherwise weak strata overlying the firm strata, enlarged base in the form of under-reamed bulb in firm strata provides larger bearing area and piles of greater bearing capacity can be made.

In loose to medium pervious sandy silty strata, bored compaction piles can be used as the process of compaction increased the load bearing capacity of the piles.

Under – reamed piles may also be used under situations where the vibration and noise caused during construction of piles are to be avoided. The provision of bulb (s) is of special advantage in under reamed piles to resist uplift and they can be used as anchors.

Procedure: As per CPWD Specifications

C) CURING

(i) 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 at least 7 days from the date of placing concrete in case of ordinary portland cement

(ii) The period of curing shall not be less than 10 days for concrete exposed to dry and hot weather conditions.

(iii) Therefore in view of the above provision in para (ii) above it is advisable to continue wet curing the exposed faces of concrete for a period of 10 days.

D) MEASUREMENT

Dimensions shall be measured nearest to a cm. measurement of length on completion shall be along the axis of pile and shall be measured upto the bottom of pile cap. No allowance shall be made for bulking, shrinkage, cut off tolerance, wastage and hiring of tools, equipment for excavation, driving etc.

E) RATE

The rate included the cost of material and labour involved in execution of pile work including pile shoe except reinforcement, pile cap and grade beam.

15.0 PILE WORK

Code No	Description	Unit	Rate Rs.
15.1	Providing, driving and installing driven cast-in-situ reinforced cement concrete piles of specified diameter and length below the pile cap in cement concrete M-35 grade, 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):		
15.1.1	400 mm dia piles	metre	1035.00
15.1.2	450 mm dia piles	metre	1270.00
15.1.3	500 mm dia piles	metre	1506.00
15.1.4	550 mm dia piles	metre	1506.00
15.1.5	750 mm dia piles.	metre	2293.00
15.2	Boring, providing and installing bored cast-in-situ reinforced cement concrete pile of specified diameter and length below the pile cap in cement concrete M-35 grade, 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):		
15.2.1	300 mm dia piles	metre	957.00
15.2.2	400 mm dia piles	metre	969.00
15.2.3	450 mm dia piles	metre	1267.00
15.2.4	500 mm dia. piles	metre	1456.00
15.2.5	600 mm dia piles	metre	1765.00
15.2.6	750 mm dia piles.	metre	2342.00

Code No	Description	Unit	Rate Rs.
15.3	Boring, Providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in cement concrete M-35 grade, 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):		
15.3.1	300 mm dia piles.	metre	1505.00
15.3.2	400 mm dia piles	metre	1538.00
15.3.3	450 mm dia piles	metre	1553.00
15.3.4	550 mm dia piles	metre	1556.00
15.4	Extra for providing additional bulb in under reamed piles, under specified dia meter (Only the quantity of extra bulbs are to be paid).		
15.4.1	300mm dia piles.	each	1094.00
15.4.2	400mm dia piles.	each	1105.00
15.4.3	450 mm dia piles.	each	1112.00
15.4.4	550 mm dia piles.	each	1168.00
15.5	Boring, providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in cement concrete 1:1½:3 (1 cement : 1½ coarse sand : 3 graded stone aggregate 20mm nominal size), to carry a safe working load, excluding the cost of steel reinforcement but including the cost of boring with auger by manual means and making one bulb using suitable bulb enlarging tool by MANUAL MEANS with all instruments and arrangements required for boring true to vertical line etc. all complete. (Length of pile for payment shall be measured upto to the bottom of pile cap):		
15.5.1	250 mm dia piles.	metre	541.00
15.5.2	300 mm dia piles	metre	776.00
15.6	Extra for providing additional bulb in under reamed piles, under specified dia using necessary bulb enlarging tool and by MANUAL MEANS (Only the quantity of extra bulbs are to be paid).		
15.6.1	250 mm dia piles.	each	323.00
15.6.2	300 mm dia piles.	each	365.00
15.7	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		

Code No	Description	Unit	Rate Rs.
	of pile cap).		
15.7.1	400 mm dia piles.	metre	1240.00
15.7.2	450 mm dia piles.	metre	1349.00
15.7.3	500 mm dia piles.	metre	1265.00
15.7.4	550 mm dia piles.	metre	1280.00
15.7.5	750 mm dia piles.	metre	1389.00
15.8	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.		
15.8.1	Single pile upto 50 tonne capacity		
15.8.1.1	Initial test.	per test	38346.00
15.8.1.2	Routine test	per test	17325.00
15.8.2	Single pile above 50 tonne and upto 100 tonne capacity		
15.8.2.1	Initial test	per test	46547.00
15.8.2.2	Routine test.	per test	26565.00
15.8.3	Group of two or more piles upto 50 tonne capacity		
15.8.3.1	Initial test	per test	56018.00
15.8.3.2	Routine test	per test	34073.00
15.9	Cyclic vertical load testing of pile in accordance with IS Code of practice IS : 2911 (part IV) including preparation of pile head etc for.		
15.9.1	Single pile.		
15.9.1.1	Upto 50 tonne capacity pile.	per test	17325.00
15.9.1.2	Above 50 tonne and upto 100 tonne capacity pile.	per test	26565.00
15.9.2	Group of two piles.		
15.9.2.1	Upto 50 tonne capacity each .	per test.	34073.00
15.10	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 :		
15.10.1	Upto 50 tonne capacity pile.	per test	17325.00
15.10.2	Above 50 tonne and upto 100 tonne capacity pile.	per test	27143.00

16.0 DISMANTALING AND DEMOLISHING

A) TERMINOLOGY

(i) **Dismantling:** The term 'Dismantling' implies carefully separating the parts without damage and removing. This may consist of dismantling one or more parts of the building as specified or shown on the drawings.

(ii) **Demolition:** The term 'Demolition' implies breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown on the drawings.

B) PRECAUTIONS & EXECUTION:

(i) The demolition shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer-in-Charge before starting the work. Due care shall be taken to maintain the safety measured prescribed in IS: 4130.

(ii) Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. The temporary enclosures or partitions and necessary scaffolding shall also be provided, as directed by the Engineer-in-Charge.

Necessary precautions shall be taken to keep down the noise and dust nuisance to the minimum.

(iii) Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Engineer-in-Charge.

(iv) Where existing fixing is done by nails, screws, bolts, rivets etc., dismantling shall be done by taking out the fixing with proper tools and not be tearing or ripping off.

(v) Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-Charge within a lead of 50 metres. All materials obtained from dismantling or demolition shall be the property of the Government unless otherwise specified. All unserviceable material rubbish etc. shall be disposed off as directed by the Engineer-in-Charge.

(vi) The contractor shall maintain/ disconnect existing services, whether temporary or permanent, where required by the Engineer-in-Charge.

(vii) All required safety measures shall be taken up by the contractor. Helmets, goggles, safety belts, first aid equipments etc shall be made available during execution.

C) MEASUREMENTS:

All works shall be measured net in the decimal system, as fixed in its place, subject to the following limits, unless otherwise stated hereinafter.

i) Dimensions shall be measured correct to a cm.

ii) Areas shall be worked out in sqm correct to two places of decimal.

iii) Cubical contents shall be worked out to the nearest 0.01 cum.

iv) Parts of work required to be dismantled and those required to be demolished shall be measured separately.

v) Measurement of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed.

vi) Specification for deduction for voids, openings etc. shall be on the same basis as that adopted for new construction of the work.

vii) Wherever flooring is to be dismantled along with base concrete or slab without obtaining serviceable material from flooring, the measurement of dismantling should be made for full thickness of flooring and base course and paid in cum of base course item. No separate measurement for dismantling of flooring in sqm to be made.

D) RATES:

(i) The rate shall 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 metres.

(ii) The rate shall 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.

16.0 DISMANTALING AND DEMOLISHING

Code No	Description	Unit	Rate Rs.
16.1	Dismantling rammed moorum and boulders or rammed moorum and silt in foundation or under floor including all lead and lifts.	cum	279.00
16.2	Dismantling bricks laid flat or on edge (each layer), or cement concrete tiles in flooring or over roofs in cement/lime mortar including stacking of serviceable material and disposal of unserviceable material within 50 metre lead.	sqm	22.50
16.3	Demolishing brick masonry including arches, stacking of serviceable material disposal of unserviceable material within 50 metres lead.		
16.3.1	In mud mortar.	cum	154.00
16.3.2	In lime mortar.	cum	187.00
16.3.3	In cement mortar.	cum	263.00
16.4	Removing mortar from bricks and cleaning the bricks including stacking within 50 metre lead. (stacks of cleaned brick shall be measured).		
16.4.1	In mud mortar	each	0.70

Code No	Description	Unit	Rate Rs.
16.4.2	In lime mortar	each	1.00
16.4.3	In cement mortar	each	1.30
16.5	Demolishing stone rubble masonry including arches, stacking of serviceable material and disposal of unserviceable material within 50 Metres lead.		
16.5.1	In lime mortar	cum	244.00
16.5.2	In cement mortar	cum	527.00
16.6	Dismantling dressed stone work ashlar face stone work, marble work or precast concrete work including arches, stacking of serviceable material and disposal of unserviceable material within 50 metres lead.		
16.6.1	In lime mortar	cum	318.00
16.6.2	In cement mortar	cum	603.00
16.7	Removing mortars from stones and concrete articles and cleaning the same. (Stacks of cleaned material shall be measured).		
16.7.1	In lime mortar	cum	110.00
16.7.2	In cement mortar	cum	154.00
16.8	Dismantling flag stone flooring laid in cement/lime mortar including stacking of serviceable material and disposal of unserviceable material within 50 metre lead.	sqm	57.00
16.9	Dismantling of old tarfelts of water proofing treatment of any course from the top of roof of any floor including disposal and removal of material with 50 metre lead.	sqm	11.00
16.10	Dismantling cement asbestos or other hard board ceiling or partition wall including stacking of serviceable material and disposal of unserviceable material within 50m lead.	sqm	13.50
16.11	Dismantling single Allahabad tiles or Manglore tiles or single wheel tiles including roof timber (excluding trusses), including stacking of serviceable material and disposal of unserviceable material within 50m lead.	sqm	44.00
16.12	Dismantling single Allahabad tiles or Manglore tiles or single wheel tiles excluding roof timber, including stacking of serviceable material and disposal of unserviceable material within 50m lead.	sqm	27.50
16.13	Dismantling double Allahabad tiles or Manglore tiles or single wheel tiles including roof timber (excluding trusses), including stacking of serviceable material and disposal of unserviceable material within 50m lead.	sqm	66.00
16.14	Dismantling double Allahabad tiles or Manglore tiles or single wheel tiles excluding roof timber, including stacking of serviceable material and disposal of unserviceable material within 50m lead.	sqm	38.50
16.15	Dismantling thatch roofing including mats, bamboo, jaffri etc. complete including stacking of serviceable materials & disposal of unserviceable materials within 50 m lead.	sqm	11.00

Code No	Description	Unit	Rate Rs.
16.16	Dismantling jack arch roofing and floor including stacking of serviceable material and disposal of unserviceable material within 50 metre lead.	sqm	55.00
16.17	Dismantling G.I. sheet roofing including ridges hips, valleys and gutters etc. and stacking the material with 50 m lead.	sqm	33.50
16.18	Dismantling asbestos sheet roofing including ridges, hips valley and gutters and stacking the materials with 50 m lead.	sqm	16.50
16.19	Dismantling stone slab roofing over wooden karries or R.C.C. battens (dismantling of karries and battens to be paid separately) including stacking of serviceable materials and disposal of unserviceable material within 50 metres lead.	cum	560.00
16.20	Dismantling wood work in frame, trusses purlins and rafters etc upto 10 metre span and upto 5 metre height above plinth level including stacking the material within 50 M. lead		
16.20.1	Of sectional area 40 sq. cm and above	cum	894.00
16.20.2	Of sectional area below 40 sq.	metre	3.60
16.21	Extra for dismantling wood work in frame, trusses purlins and rafters etc. for every additional span of one metre or part thereof beyond 10 metres.		
16.21.1	Of sectional area 40 sq. cm and above	cum	133.00
16.21.2	Of sectional area below 40 sq.	metre	0.40
16.22	Extra for dismantling wood work in frame, trusses purlins and rafters etc. for every additional height of one metre or part thereof beyond 5 metres.		
16.22.1	Sectional area 40 Sq. Cm and above	cum	183.00
16.22.2	Sectional area below 40 Sq.cm	metre	0.70
16.23	Dismantling wooden ballies, posts, purlins rafters including stacking within 50 metre lead.	mere	6.80
16.24	Dismantling wooden trellis work (excluding frame) including stacking the serviceable material within 50 metres lead.	sqm	13.00
16.25	Removing wooden boarding in lining of wall and partition (excluding supporting members) including stacking within 50 metres lead.		
16.25.1	Thickness up to 10mm thick.	sqm	14.50
16.25.2	Thickness above 10mm. & upto 25mm.	sqm	16.50
16.25.3	Thickness above 25mm. & upto 40mm.	sqm	24.50
16.26	Dismantling doors chowkhats with shutters (steel or wood) including architrave, hold fast etc. complete and stacking within 50 metres lead.	each	100.00
16.27	Dismantling windows chowkhats with shutters (steel or wood) including architrave, hold fast etc. complete and stacking within 50 metres lead..	each	66.50
16.28	Taking out door shutters (steel or wood) including stacking within 50 metres lead.	each	46.50
16.29	Taking out window shutters (steel or wood) including stacking within 50 metres lead.	each	33.50

Code No	Description	Unit	Rate Rs.
16.30	Dismantling steel work in single section in RS Joists, channels, angles, flats, I-section and T-section including dismembering and stacking within 50 Metres lead.	kg	0.70
16.31	Dismantling steel work in built-up section in angles, channels, flats I-section and T-section including all gusset plates, bolts, nuts, cutting rivets, welding etc., including dismembering and stacking within 50 metres lead.	kg	1.00
16.32	Dismantling steel work in built-up section without dismembering for a span upto 10 metre and height upto 5.0 metre above plinth level including stacking with in 50 metre lead.	kg	0.90
16.33	Extra for dismantling steel work for every additional span of one metres of part thereof beyond 10 metres.	kg	0.20
16.34	Extra for dismantling steel work for every additional height of one metre or part thereof beyond 5 metres.	kg	0.20
16.35	Extra for making structural steel work required to be re-erected.	kg	0.90
16.36	Dismantling terrazzo or mosaic or glazed vitreous or patent cement or tiled flooring or dado skirting of any thickness without sub base.	sqm	22.50
16.37	Dismantling lime/ cement plaster or skirting at any height raking out joints and cleaning the surface for plaster including disposal of rubbish within 50 metres lead.	sqm	11.00
16.38	Taking out stone/ concrete/wooden lintels from building masonry of doors windows or any other opening for thickness upto 15 cm.	metre	73.00
16.39	Taking out of cut stone beams, slabs lintels, bracket etc. for thickness exceeding 15cm and upto 30 cm.	metre	165.00
16.40	Dismantling expanded metal or welded fabrics with battens and beading including stacking the serviceable material within 50 metres lead.	sqm	15.50
16.41	Dismantling precast concrete or stone slabs in walls partitions etc. including stacking within 50 M lead.		
16.41.1	Thickness up to 38mm	sqm	60.50
16.41.2	Thickness above 38mm upto 75mm.	sqm	85.00
16.42	Demolishing R.C.C. work including stacking of steel bars and disposal of unserviceable material within 50 metre lead.	cum	768.00
16.43	Demolishing cement concrete including disposal of material within 50 metre lead.		
16.43.1	1:4:8 or leaner mix	cum	329.00
16.43.2	1:3:6 or richer mix	cum	549.00
16.44	Extra for cutting reinforcement bars in R.C.C. or R.B work. (Cross-sectional area of RCC/RB work to be measured)	sqm	447.00
16.45	Extra for scrapping cleaning and straitening reinforcement obtained on demolishing of R.C.C. or R.B. work.	kg	2.10

Code No	Description	Unit	Rate Rs.
16.46	Demolishing lime brick coba concrete and disposal or within 50 metres lead.	cum	198.00
16.47	Removing and stacking within 50 metres lead Fencing posts or structure including all earth work and dismantling concrete etc. in the base.	each	66.00
16.48	Dismantling and stacking within 50 M lead R.C.C. fencing posts or structure including all earth work and dismantling of concrete etc. in the base.	each	77.00
16.49	Cutting ballies or wooden posts of fencing at the points of projection above the concrete or ground and stacking the same within 50 metre lead.	each	9.10
16.50	Taking out R.C.C. jali at any place and positions and of any shape and thickness including finishing the opening.	sqm	50.50
16.51	Dismantling C.I. or asbestos rain water pipes with fittings & clamps including stacking the material within 50 metre lead		
16.51.1	75 mm to 100mm dia pipe	metre	16.50
16.51.2	150 mm dia pipe.	metre	20.00
16.52	Removing barbed wire or flexible wire rope in fencing including making rolls and stacking within 50 metre lead.	kg	7.70
16.53	Removing following vitreous china sanitorywares carefully for re-use including stacking within 50 metres lead.		
16.53.1	Wash basin of all sizes and shapes	each	30.50
16.53.2	Urinals of all sizes and shapes	each	38.00
16.53.3	European/ Anglo Indian WC pan of all sizes	each	46.00
16.53.4	Cysten of all sizes and shapes	each	34.50
16.53.5	PVC Cistern	each	23.00

17.0 REPAIR TO BUILDINGS

A) EXECUTION OF WORK

i) Repair to plaster work include cutting the patch and preparing the wall surface. The mortar of the patch, where the existing plaster has cracked, crumbled or sounds hollow when gently tapped on the surface, shall be removed. The patch shall be cut out to a square or rectangular shape at position marked on the wall as directed by the departmental staff. The edges shall be slightly under cut to provide a neat joint. Plastering operation with specified mortar shall be done as per specification.

ii) Patches of 2.5 sqm and less in area shall be measured under the item “Repair to plaster”. Plastering in patches over 2.5 sqm shall be measured in item of normal plaster.

iii) Doors windows and ventilators in existing opening shall be conveniently erected in position. The holdfasts of overall length of 35cm. 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.

iv) 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 & dismantling should be followed

v) Renewing glass panes with putty and nails or with wooden fillets: Work is to be carried out as per item of work and as per specifications.

vi) 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 15x7.50 cm. 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 1.:2:4 (1 cement : 2 Coarse sand : 4 crushed stone aggregate 20mm) and curing shall be done as per specifications.

vii) R.C.C. columns and beams which have cracked or where reinforcement 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.

viii) 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.

B) MEASUREMENT

(i) The items for which the unit of measurement is cum, the length, width and height shall be measured correct to cm. and the quantity shall be calculated in cum correct to two places of decimal.

(ii) The items for which the unit of measurement is sqm, the length and height shall be measured correct to cm. and the quantity shall be calculated in sqm correct to two places of decimal.

(iii) The items having unit of measurement each, shall be enumerated and quantity shall be taken in nos.

(iv) Items for which unit is in kg, each and every component of article shall be measured in length correct to cm and shall be multiplied by unit weight of the section with the help of steel table correct to two places of decimal in kg. Weight of all components shall be added to obtain the weight of article.

C) RATES

The rate of this chapter includes cost of all material, labour, hardware, T&P, wastages, scaffolding and hire & running charges of machinery etc. required to execute the work and preparation of existing surface if required.

NOTE : However, wherever height for the repair of the plaster or similar work is more than 10 m above ground level and scaffolding is practically necessary and decided by Engineer-in-Charge, double scaffolding will be provided and paid separately.

17.0 REPAIR TO BUILDINGS

Code No	Description	Unit	Rate Rs.
17.1	Repairs to plaster in patches of area 2.5 sq. metres and under including cutting the patch in proper shape, raking out joints and preparing and plastering the surface of the walls with cement mortar 1:4 (1 cement : 4 fine sand) complete including disposal of rubbish to the dumping ground within 50metres lead :		
17.1.1	Thickness upto 15mm	sqm	132.00
17.1.2	Thickness more than 15mm and upto 20mm	sqm	148.00
17.2	Providing and replacing broken floor tile with ceramic glazed floor tiles conforming to IS : 15622 of approved size, make, colour, shade laid on 20 mm thick Cement Mortar 1:4 (1 cement : 4 coarse sand) including removing the broken tile and mortar, pointing the joints with white cement mixed with matching pigment etc., complete.		
17.2.1	Size 300x300mm	sqm	1151.00
17.2.2	Size above 300x300mm	sqm	1187.00
17.3	Providing and replacing broken floor tile with rectified ceramic glazed floor tiles of size 300x300mm and above conforming to IS : 15622 of approved make, colour, shade laid on 20 mm thick Cement Mortar 1:4 (1 cement : 4 coarse sand) including removing the broken tile and mortar, pointing the joints with white cement mixed with matching pigment etc., complete.		
17.3.1	In all colours except White, Ivory, Grey, Fume Red Brown,	sqm	1317.00
17.3.2	In colours such as White, Ivory, Grey, Fume Red Brown,	sqm	1364.00
17.4	Providing and replacing broken floor tile with porcelain floor tiles of size 600x600mm with water absorption's less than 0.5% and conforming to IS : 15622 of approved make , laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including removing the broken tile and mortar, grouting the joints with white cement and matching pigments etc. complete:	sqm	1169.00

Code No	Description	Unit	Rate Rs.
17.5	Providing and replacing broken floor tile with vitrified floor tiles with soluble salt printing, of size 600x600mm with water absorption less than 0.5% and conforming to IS : 15622 of approved make, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including removing the broken tile and mortar, grouting the joints with white cement and matching pigments etc. complete:	sqm	1422.00
17.6	Providing and replacing broken floor tile with vitrified floor tiles with double charge/ multi charge printing with water absorption less than 0.5% and conforming to IS : 15622 of approved make in all colours and shades and size mentioned below (+/- 10mm), laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including removing the broken tile and mortar, grouting the joints with white cement and matching pigments etc. complete:		
17.6.1	Size 600x600mm	sqm	1611.00
17.6.2	Size 800x800mm	sqm	1805.00
17.6.3	Size 1000x1000mm	sqm	2021.00
17.7	Providing and replacing broken vitreous china water closet squatting pan (Indian type) including removing the broken squatting pan and mortar, cutting and making good the walls and floors wherever required:		
17.7.1	White Long pattern W.C. pan of size 580 mm	each	1448.00
17.7.2	Coloured Long pattern W.C. pan of size 580 mm	each	1795.00
17.7.3	White Orissa pattern W.C. pan of size 580x440 mm	each	1888.00
17.7.4	Coloured Orissa pattern W.C. pan of size 580x440 mm	each	2535.00
17.8	Providing and replacing broken vitreous china water closet (European type W.C. pan) including removing the broken water closet (European type W.C. pan) cutting and making good the walls and floors wherever required :		
17.8.1	White pedestal type	each	1295.00
17.8.2	Coloured pedestal type	each	1810.00
17.8.3	White wall hung type	each	2943.00
17.8.4	Coloured wall hung type	each	4299.00
17.9	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 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) 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 metres lead :		
17.9.1	Door chowkhats	each	441.00
17.9.2	Window chowkhats	each	317.00
17.9.3	Clerestory window chowkhats	each	219.00

Code No	Description	Unit	Rate Rs.
17.10	Fixing chowkhat in existing opening in brick / RCC wall with dash fasteners/ chemical fastener of appropriate size (3nos on each vertical member of door chowkhat and 2 nos. on each vertical member of window chowkhats including cost of dash fasteners/ chemical fastener.	each	94.00
17.11	Making the opening in brick masonry for door/ window/ clerestory window 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 malba/ rubbish to the nearest municipal dumping ground.	sqm	272.00
17.12	Renewing glass panes, with putty and nails wherever necessary:		
17.12.1	Float glass panes of thickness 4 mm	sqm	524.00
17.12.2	Float glass panes of thickness 5.5 mm	sqm	620.00
17.13	Renewing glass panes, with wooden fillets wherever necessary:		
17.13.1	Float glass panes of thickness 4 mm	sqm	669.00
17.13.2	Float glass panes of thickness 5.5 mm	sqm	765.00
17.14	Renewing glass panes and refixing existing wooden fillets:		
17.14.1	Float glass panes of thickness 4 mm	sqm	548.00
17.14.2	Float glass panes of thickness 5.5 mm	sqm	645.00
17.15	Supplying and fixing new wooden fillets wherever necessary:		
17.15.1	Teak wood fillets	metre	26.50
17.15.2	Bija, sal	metre	21.50
17.16	Renewal of old putty of glass panes (length)	metre	13.50
17.17	Refixing old glass panes with putty and nails	sqm	175.00
17.18	Fixing old glass panes with wooden fillets (excluding cost of fillets)	sqm	140.00
17.19	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	144.00
17.20	Replacing Dholpur sand stone slabs 30 to 50 mm thick 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 metres of lead :	sqm	325.00
17.21	Renewing Bijasal wooden battens in 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 metres lead :	cum	60050.00
17.22	Renewing Bijasal wooden beams in 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 metres lead :		
17.22.1	Not exceeding 4.00 metres in length.	cum	60901.00

Code No	Description	Unit	Rate Rs.
17.22.2	Above 4.00 metres and upto 5.00 metres length.	cum	76379.00
17.23	Renewing aluminium door/ window by replacing demaged member by anodised/ powder coated aluminium sections of same diamentions complete including depositng dismentalled section at departmental store.	kg	354.00
17.24	Providing and fixing galvanized wire gauge having M.S. wire dia of 0.45 mm for doors, windows, clerestory windows excluding hinges.	sqm	541.00
17.25	Providing and replacing broken/ damaged false ceiling tiles with new ceiling tiles on existing frame work.		
17.25.1	12mm thick unveneered Nova teak or equivalent super plain tiles	sqm	604.00
17.25.2	12 mm thick half random perorated tiles Perforated area 5%	sqm	546.00
17.25.3	12 mm thick half random perorated tiles Perforated area 13%	sqm	583.00
17.25.4	12.5 mm thick Glass fibre reinforced Gypsum board.	sqm	401.00
17.26	Raking out joints in lime or cement mortar and preparing the surface for re-pointing or re-plastering including disposal of rubbish to the dumping ground within 50 metres lead.	sqm	14.50
17.27	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
17.28	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.	metre	46.50
17.29	Renewing bottom rail and/or top runner of collapsible gate including making good all damages and applying priming coat of zinc chromate yellow primer of approved brand and manufacturer.	kg	95.00
17.30	Renewing wrought iron or M.S. Wheel or roller of steel door or gate and fitting and fixing the same with necessary clamps, nuts and bolts/welding and erection etc. complete.		
17.30.1	Wheel 50 mm dia. and below.	each	110.00
17.30.2	Wheel above 50 mm dia.	each	179.00
17.31	Rubbing and polishing old flooring to the complete satisfaction of Engineer-in-Charge.		
17.31.1	Marble chips flooring	sqm	45.50
17.31.2	Marble flooring	sqm	54.50
17.31.3	Granite flooring	sqm	118.00
17.32	Extra for wax polishing Marble/ Marble chips flooring to the complete satisfaction of Engineer-in-Charge.	sqm	18.00
17.33	Extra for mirror polishing on Kota/ Granite/ Marble flooring to give high gloss finish complete to the satisfaction of Engineer-in-Charge.	sqm	55.00

Code No	Description	Unit	Rate Rs.
17.34	Providing and fixing double scaffolding system (cup lock type) on the exterior side, upto seven story height made with 40mm dia. M.S. tube 1.5 m 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 thereafter. 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 elevational area of the scaffolding shall be measured for payment purpose. The payment will be made once irrespective of duration of scaffolding. (To be used for maintenance work judicially necessary deduction for scaffolding in the existing item to be done).	sqm	112.00

18.0 SANITARY INSTALLATIONS

A) TERMINOLOGY

(1) **Anti siphon Pipe:** A ventilating pipe connected to or close to the outlet side of a trap seal.

(2) **Ball Cock:** A faucet opened or closed by the fall or rise of a ball floating in the surface of water.

(3) **Ball Valve:** A simple non return valve consisting of a ball resting on a cylindrical seat within a fluid passageway.

(4) **Bell mouth:** An expanded rounded entrance to a pipe or orifice.

(5) **Bend** Length of pipe bent or cast into an angle shape.

(6) **Bib Tap** A tap with a horizontal inlet and nozzle bent to discharge in a downward direction.

(7) **Blister** A raised portion of the surface protruding not more than one millimetre above the surface and not greater than 3 mm in its greatest dimension.

(8) **Box Union** A device for joining two threaded pipes.

(9) **Branch**

(a) A special form of vitrified sewer and cast iron pipe used for making connections to a sewer or water main. The various types are called T, Y, T-Y, double Y, and V branches, according to their respective shapes.

(b) Any part of piping system other than a main.

(10) **Caulking**

(a) The process of driving, pouring or forcing lead, oakum, plastic or other material into a joint to make it leak proof.

(b) The material used in the caulking process.

(11) **Caulked Joint** A spigot and socket joint in which the jointing material is compacted by means of caulking tool and hammer.

(12) **Chase** A continuous recess in wall, floor or ceiling for the purpose of holding pipes and conduits.

(13) **Collar** A pipe fitting in the form of sleeve for jointing the spigot ends of two pipes in the same alignment.

(14) **Cowl :** A hood on the top of a vent pipe or soil stack.

(15) **Craze or Crazing** Fine cracks in the glaze.

(16) **Cross** A pipe fitting used for connecting four pipes at right angles.

(17) **Fittings** Coupling, flange, branch, bend, tee, elbow, union, waste with plug, P or S trap with vent, ferrule, stop tap, bib tap, pillar tap, globe tap, ball valve, cistern, storage tank, baths, water closets, boiler geyser, pumping set with motor and accessories, metre, hydrant valve and any other article used in connection with water supply, drainage and sanitation.

(18) **Float Valve:** A valve in which the closure to an opening such as a plug or gate, is actuated by a float to control the flow in to a tank.

(19) **Flush Bend** A bend located at the bottom of low level flushing cistern for the purpose of flushing pedestal type water closet and similar fixture.

(20) **Flushing cistern:** A cistern provided with a device for rapidly discharging the contained water and used in connection with a sanitary appliance for the purpose of cleaning the appliance and carrying away its contents into a drain.

(21) **Gasket** A piece of compressible material used to make a joint between two flat surfaces.

(22) **Oakum** Hemp or old hemp rope soaked in oil to make it water proof.

(23) **One Pipe System:** In this a single soil waste pipe conveys both soil and waste directly to the building drain.

(24) **Pinhole** A hole in the body, less than 1.5 mm, in its maximum dimension.

(25) **Reducer** A pipe fitting with inside threads larger at one end than at the other. All such fittings having more than one size are reducers because of the custom of stating the larger size first.

(26) **Single stack system:** This is the name given to a simplified one pipe system wherein all ventilation pipes are omitted. The stack itself is made to cater (or provide) for all the vent requirements by restricting the flow into the stack to certain predetermined limits.

(27) **Sink:** A shallow fixture, ordinarily with a flat bottom, that is usually used in kitchen or in connection with the preparation of food, laboratory purposes and for certain industrial processes.

(28) **Socket** The female part of spigot and socket joint.

(29) **Soil Pipe** A pipe which conveys to drain the discharge from a water closet or urinals. In ‘One pipe’ and ‘single stack’ system the soil pipe also conveys to a drain the discharges from bath, wash basins, sinks, and similar appliances.

(30) **Speck** Area of the finished surface with contrasting colour less than one millimetre maximum dimension.

(31) **Spigot** The male part of a spigot and socket joint.

(32) **Spigot and Socket Joint** Joint in which the end of the one pipe enters the enlarged end of the next pipe.

(33) **Stack** A main vertical discharge or ventilating pipe.

(34) **Trap** A fitting or device so designed and constructed as to provide, when properly vented, a liquid seal which will prevent the back passage of air without materially affecting the flow of sewage or waste water through it.

(35) **Two pipe system:** In this, the soil pipe conveys discharges from water closets, urinals, and similar soil appliances directly to the drainage system and the waste pipe conveys waste from ablutionary and culinary appliances to the drainage system directly or through a trapped gully where desired.

(36) **Union** A pipe fitting used for joining the ends of two pipes neither of which can be turned.

(37) **Valve** A device used for controlling the flow of liquid in a line of pipe.

(38) **Ventilating pipe (Vent pipe)** The pipe which provides a safe outlet into the atmosphere for the foul gases in the drain or sewer.

(39) **Warpage** Distortion of original shape during manufacturing process.

(40) **Water Seal** The depth of water which should be removed from a fully charged trap before air can pass through the trap.

(41) **Waste Pipe** A pipe used to convey liquid waste not containing human excreta.

(42) **Waste Stack** A vertical pipe used to convey liquid waste not containing human excreta.

B) MATERIALS

Water closets and urinals, wash Basin, sinks, M.S./ C.I. cantilever brackets for wash basin & sink, flushing cistern other sanitary fittings and accessories shall be ISI marked and of make specified in contract or approved by department. All material shall be ISI marked and if ISI marked is not available it shall confirm to BIS specification. The materials for which BIS specification is not available, approved make shall be used.

C) LAYING

(i) All joints shall be made with special care, particularly those between pipes of different materials. All joints shall be perfectly air and water tight. No joint shall be embedded in wall, if avoidable.

(ii) The interior of the socket and exterior of the spigots shall be thoroughly cleaned and dried. The spigot end shall be inserted into the socket right upto the back of the socket and carefully centered by two or three laps of treated spun yarn, twisted into ropes of uniform thickness, well caulked into the back of the socket. No piece of yarn shall be shorter than the circumference of the pipe. The jointed pipe line shall be at required levels and alignment.

(iii) The leading of pipes shall be made by means of ropes covered with clay or by using special leading rings. The lead shall be melted so as to be thoroughly fluid and each joint shall be filled in one pouring.

(iv) In order to ensure that adequate lead is poured properly into the joints and to control waste in use of lead, at the beginning of work three or four sample joints shall be made and the quantum of lead per joint approved by the Engineer-in-Charge.

D) MEASUREMENTS:

(i) The pipes shall be measured net along its length, correct to a cm when fixed in position including pipe fitting accessories but excluding all sanitary fittings.

(ii) When collars are used for jointing SCI pipes these shall be measured as fittings and shall be paid for separately.

(iii) The items having unit of measurement each, shall be enumerated.

(iv) The item having the unit of measurement in pair shall be counted in paires

E) RATES:

The rate of this chapter includes cost of all material, labour, hardware, T&P, wastages, scaffolding and hire & running charges of machinery etc. required to execute and complete the work.

18.0 SANITARY INSTALLATIONS

Code No	Description	Unit	Rate Rs.
18.1	Providing and fixing water closet squatting pan (Indian type W.C. pan), 100mm sand cast Iron P or S trap, 10 litre low level P.V.C. flushing cistern (same colour) conforming to IS : 7231, with flush bend and other fittings and fixtures complete including cutting and making good the walls and floors wherever required :		
18.1.1	White Long pattern W.C. pan of size 580 mm	each	2459.00
18.1.2	Coloured Long pattern W.C. pan of size 580 mm	each	2913.00*
18.1.3	White Orissa pattern W.C. pan of size 580x440 mm	each	2899.00
18.1.4	Coloured Orissa pattern W.C. pan of size 580x440 mm	each	3545.00*
18.2	Providing and fixing vitreous china water closet squatting pan (Indian type) including cutting and making good the walls and floors wherever required:		
18.2.1	White Long pattern W.C. pan of size 580 mm	each	999.00
18.2.2	Coloured Long pattern W.C. pan of size 580 mm	each	1346.00*
18.2.3	White Orissa pattern W.C. pan of size 580x440 mm	each	1440.00
18.2.4	Coloured Orissa pattern W.C. pan of size 580x440 mm	each	2086.00*
18.3	Providing and fixing a pair of white vitreous china foot rests of standard pattern for squatting pan water closet:		
18.3.1	250x130x30 mm	pair	270.00
18.3.2	250x125x25 mm	pair	259.00
18.4	Providing and fixing vitreous china water closet (European type W.C. pan) with white ISI marked plastic seat and lid, 10 litre low level white P.V.C. flushing cistern (same colour), conforming to IS : 7231, with all		

Code No	Description	Unit	Rate Rs.
	fittings and fixtures complete including cutting and making good the walls and floors wherever required :		
18.4.1	White pedestal type	each	2882.00
18.4.2	Coloured pedestal type	each	3592.00*
18.4.3	White wall hung type	each	4415.00
18.4.4	Coloured wall hung type	each	5967.00*
18.5	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 ISI marked white plastic seat and lid, 10 litre PVC low level flushing cistern with fitting and brackets, 40mm flush bend, mosquito proof coupling complete, including painting of brackets, cutting and making good the walls and floors wherever required :		
18.5.1	White	each	4589.00
18.5.2	Coloured	each	5901.00*
18.6	Providing and fixing white vitreous china pedestal type (European type/ wash down type) water closet pan including cutting and making good the walls and floors wherever required:		
18.6.1	White pedestal type	each	1180.00
18.6.2	Coloured pedestal type	each	1695.00*
18.6.3	White wall hung type	each	2714.00
18.6.4	Coloured wall hung type	each	4070.00*
18.7	Providing and fixing 10 litre capacity P.V.C. low level flushing cistern conforming to IS : 7231, with all fittings and fixtures complete.		
18.7.1	White	each	729.00
18.7.2	Coloured	each	837.00*
18.8	Providing and fixing vitreous china 10 litre (full flush) capacity controlled flush low level cistern with all fittings complete.		
18.8.1	White	each	1334.00*
18.8.2	Coloured	each	1941.00*
18.9	Providing and fixing ISI marked plastic seat with lid for pedestal type W.C. pan complete:		
18.9.1	White/ black	each	620.00
18.9.2	Coloured	each	707.00
18.10	Providing and fixing 15 mm nominal bore uplasticised PVC connection pipe with PTMT nuts and PVC bush of approved quality and colour:		
18.10.1	30 CM length	each	56.00
18.10.2	45 CM length	each	66.50

Code No	Description	Unit	Rate Rs.
18.11	Providing and fixing 15 mm nominal bore C.P copper connection pipe with C.P brass nuts collar and PVC bush of approved quality:		
18.11.1	30 CM length	each	210.00
18.11.2	45 CM length	each	239.00
18.12	Providing and fixing vitreous china pedestal type water closet (European type) with inbuilt 10 litre low level vitreous china flushing cistern, ISI marked plastic seat and lid (same colour), mosquito proof coupling complete:		
18.12.1	White	each	5108.00*
18.12.2	Coloured	each	6732.00*
18.13	Providing and fixing white vitreous china urinal basin with waste fitting as per IS : 2556, and other couplings in C.P. brass complete:		
18.13.1	Flat back half stall urinal of size 460x380x250mm	each	1776.00
18.13.2	Flat back type urinal of size 460x380x250mm	each	1529.00
18.13.3	Wall corner type urinal of sizes 340x410x265mm	each	1659.00
18.14	Providing and fixing white vitreous china urinal basin as per IS : 2556 complete:		
18.14.1	Flat back half stall urinal of size 460x380x250mm	each	1183.00
18.14.2	Flat back type urinal of size 460x380x250mm	each	872.00
18.14.3	Wall corner type urinal of sizes 340x410x265mm	each	1002.00
18.15	Providing and fixing one piece construction white vitreous china squatting plate urinal with an integral rim longitudinal flushing pipe, standard size G.I. flush pipe for back and front flush, C.P. brass coupling complete including cutting and making good the walls and floors etc. wherever required :	each	2014.00
18.16	Providing and fixing one piece construction white vitreous china squatting plate urinal with an integral rim longitudinal flushing pipe.	each	1401.00
18.17	Providing and fixing vitreous china wash basin with C.I. brackets, 32 mm C.P. brass waste of standard pattern, including painting of brackets, cutting and making good the walls wherever required :		
18.17.1	White Size 550x450 mm	each	1430.00
18.17.2	White Size 550x400 mm	each	1408.00
18.17.3	White size 450x325 mm	each	1203.00
18.17.4	White Angle back size 400x400 mm	each	1174.00
18.17.5	White Oval or round size 550x400mm.	each	1605.00
18.17.6	White Surgeon type size 660x460 mm	each	2587.00
18.17.7	Coloured Size 550x450 mm	each	1894.00
18.17.8	Coloured Size 550x400 mm	each	1861.00

Code No	Description	Unit	Rate Rs.
18.17.9	Coloured size 450x325 mm	each	1551.00
18.17.10	Coloured Angle back size 400x400 mm	each	1533.00
18.17.11	Coloured Oval or round size 550x400mm.	each	2177.00
18.18	Providing and fixing white vitreous china wash basin including making all connections but excluding the cost of fittings :		
18.18.1	White Size 550x450 mm	each	936.00
18.18.2	White Size 550x400 mm	each	915.00
18.18.3	White size 450x325 mm	each	724.00
18.18.4	White Angle back size 400x400 mm	each	715.00
18.18.5	White Oval or round size 550x400mm.	each	1131.00
18.18.6	White Surgeon type size 660x460 mm	each	2113.00
18.18.7	Coloured Size 550x450 mm	each	1401.00
18.18.8	Coloured Size 550x400 mm	each	1368.00
18.18.9	Coloured size 450x325 mm	each	1072.00
18.18.10	Coloured Angle back size 400x400 mm	each	1058.00
18.18.11	Coloured Oval or round size 550x400mm.	each	1703.00
18.19	Providing and fixing vitreous china pedestal for wash basin completely recessed at the back for the reception of pipes and fittings.		
18.19.1	White	each	1130.00
18.19.2	Coloured	each	1702.00*
18.20	Providing and fixing stainless steel AISI-304(18/8) wash basin with C.I. brackets, 32 mm C.P. brass waste of standard pattern, including painting of brackets, cutting and making good the walls wherever required :		
18.20.1	Size 450x380 mm	each	3876.00
18.20.2	Size 510x410 mm	each	4095.00
18.21	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink with drain board 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 :		
18.21.1	1145x510 mm bowl size 560x410x241 mm	each	11767.00*
18.21.2	1040x510 mm bowl size 460x410x200 mm	each	8539.00*
18.21.3	1000x510 mm bowl size 460x410x175 mm	each	8150.00*
18.21.4	915x460 mm bowl size 410x355x175 mm	each	7152.00*

Code No	Description	Unit	Rate Rs.
18.22	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink without drain board 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 :		
18.22.1	345x445 mm bowl depth 200 mm.	each	6298.00*
18.22.2	560x410 mm bowl depth 215 mm.	each	6210.00*
18.22.3	410x355 mm bowl depth 165 mm.	each	4396.00*
18.23	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 brackets, cutting and making good the wall wherever required :		
18.23.1	Size 450x300x150mm	each	2504.00
18.23.2	Size 600x450x200mm	each	4502.00
18.24	Providing and fixing white vitreous china laboratory sink including making all connections excluding cost of fittings:		
18.24.1	Size 450x300x150 mm.	each	1559.00
18.24.2	Size 600x450x200 mm.	each	3557.00
18.25	Providing and fixing flexible P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.		
18.25.1	32 mm dia	each	68.50
18.25.2	40 mm dia	each	88.50
18.26	Providing and fixing PVC waste coupling in wash basin/ sink.		
18.26.1	25 mm	each	49.50
18.26.2	40 mm	each	61.00
18.27	Providing and fixing cast iron grating for gully trap.		30.00
18.27.1	100x100mm square or round	each	30.00
18.27.2	150x150mm square	each	38.00
18.28	Providing and fixing in position 25mm diameter mosquito proof coupling of approved municipal design.	each	41.00
18.29	Providing and fixing 600x450 mm beveled edge 4mm mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	each	599.00
18.30	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 :		
18.30.1	5mm thick mirror	sqm	2016.00

Code No	Description	Unit	Rate Rs.
18.31	Providing and fixing 600x120x5mm glass shelf with edges rounded off supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	each	272.00
18.32	Providing and fixing sand cast iron S&S pipe as per IS: 1729 for soil, waste and vent pipes:		
18.32.1	100 mm dia.	metre	783.00
18.32.2	75 mm dia:	metre	658.00
18.33	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 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the walls etc. :		
18.33.1	For 100 mm dia pipe	each	85.50
18.33.2	For 75 mm dia pipe	each	83.00
18.34	Providing and fixing sand cast iron S&S bend with access door of required degree as per IS : 1729, insertion rubber washer 3 mm thick, bolts and nuts:		
18.34.1	100 mm dia	each	418.00
18.34.2	75 mm dia	each	316.00
18.35	Providing and fixing sand cast iron S&S plain bend of required degree as per IS : 1729:		
18.35.1	100 mm dia	each	341.00
18.35.2	75 mm dia	each	283.00
18.36	Providing and fixing sand cast iron S&S heel rest sanitary bend as per IS : 1729:		
18.36.1	100 mm dia	each	385.00
18.36.2	75 mm dia	each	290.00
18.37	Providing and fixing sand cast iron S&S double equal junction with access door of required degree as per IS : 1729, insertion rubber washer 3 mm thick, bolts and nuts:		
18.37.1	100x100x100x100mm	each	720.00
18.37.2	75x75x75x75 mm	each	494.00
18.38	Providing and fixing sand cast iron S&S double equal plain junction of required degree as per IS : 1729:		
18.38.1	100x100x100x100 mm	each	659.00
18.38.2	75x75x75x75 mm	each	450.00
18.39	Providing and fixing sand cast iron S&S single equal junction with access door of required degree as per IS : 1729, insertion rubber washer 3 mm thick, bolts and nuts:		

Code No	Description	Unit	Rate Rs.
18.39.1	100x100x100 mm	each	526.00
18.39.2	75x75x75 mm	each	378.00
18.40	Providing and fixing sand cast iron S&S single equal plain junction of required degree as per IS : 1729 :		
18.40.1	100x100x100 mm	each	464.00
18.40.2	75x75x75 mm	each	322.00
18.41	Providing and fixing sand cast iron S&S double unequal junction with access door of required degree as per IS : 1729, insertion rubber washer 3 mm thick, bolts and nuts:		
18.41.1	100x100x75x75 mm	each	613.00
18.42	Providing and fixing sand cast iron S&S double unequal junction of required degree as per IS : 1729 :		
18.42.1	100x100x75x75 mm	each	557.00
18.43	Providing and fixing sand cast iron S&S single unequal junction with access door of required degree as per IS : 1729, insertion rubber washer 3 mm thick, bolts and nuts complete:		
18.43.1	100x100x75 mm	each	513.00
18.44	Providing and fixing sand cast iron S&S single unequal plain junction of required degree as per IS : 1729:		
18.44.1	100x100x75 mm	each	464.00
18.45	Providing and fixing sand cast iron S&S double equal plain invert branch of required degree as per IS : 1729:		
18.45.1	100x100x100x100 mm	each	647.00
18.45.2	75x75x75x75 mm	each	456.00
18.46	Providing and fixing sand cast iron S&S single equal plain invert branch of required degree as per IS : 1729:		
18.46.1	100x100x100 mm	each	575.00
18.46.2	75x75x75 mm	each	439.00
18.47	Providing and fixing sand cast iron S&S double unequal plain invert branch of required degree as per IS : 1729:		
18.47.1	100x100x75x75 mm	each	719.00
18.48	Providing and fixing sand cast iron S&S single unequal plain invert branch of required degree as per IS : 1729:		
18.48.1	100x100x75 mm	each	524.00
18.49	Providing and fixing sand cast iron S&S off set as per IS: 1729.		
18.49.1	75 mm dia, 76 mm projected	each	222.00
18.49.2	100 mm dia, 76 mm projected	each	362.00
18.49.3	75 mm dia, 114 mm projected	each	269.00

Code No	Description	Unit	Rate Rs.
18.49.4	100 mm dia, 114 mm projected	each	350.00
18.49.5	75 mm dia, 152 mm projected	each	311.00
18.49.6	100 mm dia, 152 mm projected	each	447.00
18.50	Providing and fixing sand cast iron S&S door piece as per IS: 1729:		
18.50.1	100 mm	each	266.00
18.50.2	75 mm	each	193.00
18.51	Providing and fixing sand cast iron S&S terminal guard as per IS: 1729:		
18.51.1	100 mm	each	282.00
18.51.2	75 mm	each	227.00
18.52	Providing and fixing sand cast iron S&S collar as per IS: 1729:		
18.52.1	100 mm	each	205.00
18.52.2	75 mm	each	166.00
18.53	Providing and filling the joints with spun yarn, cement slurry and cement mortar 1:2 (1 cement : 2 fine sand) to sand cast iron/ centrifugally cast (spun) iron pipes and fittings of diameter:		
18.53.1	100 mm	each	43.50
18.53.2	75 mm	each	37.50
18.54	Providing lead caulked joints to sand cast iron/ centrifugally cast (spun) iron pipes and fittings of diameter:		
18.54.1	100 mm	each	228.00
18.54.2	75 mm	each	212.00
18.55	Providing and fixing M.S. stays and clamps for sand cast iron/ centrifugally cast (spun) iron pipes of diameter :		
18.55.1	100 mm	each	61.00
18.55.2	75 mm	each	56.50
18.56	Providing and fixing sand cast iron S&S trap of self cleansing design with screwed down or hinged grating with or without vent arm as per IS: 1729 complete, including cost of cutting and making good the walls and floors :		
18.56.1	100 mm inlet and 100 mm outlet	each	562.00
18.56.2	100 mm inlet and 75 mm outlet	each	497.00
18.57	Providing fixing and push on jointing sand cast iron S&S pipe as per IS: 3989 for soil, waste and vent pipes including EPDM rubber gasket complete:		
18.57.1	100 mm dia.	metre	854.00
18.57.2	75 mm dia:	metre	708.00

Code No	Description	Unit	Rate Rs.
18.58	Providing fixing and push on jointing sand cast iron S&S bend with access door of required degree as per IS: 3989, insertion rubber washer 3 mm thick, bolts and nuts including EPDM rubber gasket complete:.		
18.58.1	100 mm dia	each	437.00
18.58.2	75 mm dia	each	341.00
18.59	Providing fixing and push on jointing sand cast iron S&S plain bend of required degree as per IS: 3989 including EPDM rubber gasket complete::		
18.59.1	100 mm dia	each	380.00
18.59.2	75 mm dia	each	274.00
18.60	Providing fixing and push on jointing sand cast iron S&S heel rest sanitary bend as per IS: 3989 including EPDM rubber gasket complete::		
18.60.1	100 mm dia	each	446.00
18.60.2	75 mm dia	each	345.00
18.61	Providing fixing and push on jointing sand cast iron S&S double equal junction with access door of required degree as per IS: 3989, insertion rubber washer 3 mm thick, bolts and nuts including EPDM rubber gasket complete::		
18.61.1	100x100x100x100mm	each	800.00
18.61.2	75x75x75x75 mm	each	607.00
18.62	Providing fixing and push on jointing sand cast iron S&S double equal plain junction of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.62.1	100x100x100x100 mm	each	753.00
18.62.2	75x75x75x75 mm	each	556.00
18.63	Providing fixing and push on jointing sand cast iron S&S single equal junction with access door of required degree as per IS: 3989, insertion rubber washer 3 mm thick, bolts and nuts including EPDM rubber gasket complete:		
18.63.1	100x100x100 mm	each	621.00
18.63.2	75x75x75 mm	each	418.00
18.64	Providing fixing and push on jointing sand cast iron S&S single equal plain junction of required degree as per IS: 3989 including EPDM rubber gasket complete::		
18.64.1	100x100x100 mm	each	548.00
18.64.2	75x75x75 mm	each	355.00

Code No	Description	Unit	Rate Rs.
18.65	Providing fixing and push on jointing sand cast iron S&S double unequal junction with access door of required degree as per IS: 3989, insertion rubber washer 3 mm thick, bolts and nuts including EPDM rubber gasket complete:		
18.65.1	100x100x75x75 mm	each	977.00
18.66	Providing fixing and push on jointing sand cast iron S&S double unequal junction of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.66.1	100x100x75x75 mm	each	868.00
18.67	Providing fixing and push on jointing sand cast iron S&S single unequal junction with access door of required degree as per IS: 3989, insertion rubber washer 3 mm thick, bolts and nuts including EPDM rubber gasket complete:		
18.67.1	100x100x75 mm	each	760.00
18.68	Providing fixing and push on jointing sand cast iron S&S single unequal plain junction of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.68.1	100x100x75 mm	each	666.00
18.69	Providing fixing and push on jointing sand cast iron S&S double equal plain invert branch of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.69.1	100x100x100x100 mm	each	761.00
18.69.2	75x75x75x75 mm	each	611.00
18.70	Providing fixing and push on jointing sand cast iron S&S single equal plain invert branch of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.70.1	100x100x100 mm	each	704.00
18.70.2	75x75x75 mm	each	525.00
18.71	Providing fixing and push on jointing sand cast iron S&S double unequal plain invert branch of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.71.1	100x100x75x75 mm	each	1039.00
18.72	Providing fixing and push on jointing sand cast iron S&S single unequal plain invert branch of required degree as per IS: 3989 including EPDM rubber gasket complete:		
18.72.1	100x100x75 mm	each	758.00
18.73	Providing fixing and push on jointing sand cast iron S&S off sets as per IS: 3989 including EPDM rubber gasket complete:		
18.73.1	75 mm dia, 76 mm projected	each	287.00
18.73.2	100 mm dia, 76 mm projected	each	366.00

Code No	Description	Unit	Rate Rs.
18.73.3	75 mm dia, 114 mm projected	each	327.00
18.73.4	100 mm dia, 114 mm projected	each	448.00
18.73.5	75 mm dia, 152 mm projected	each	355.00
18.73.6	100 mm dia, 152 mm projected	each	494.00
18.74	Providing fixing and push on jointing sand cast iron S&S door piece as per IS: 3989 including EPDM rubber gasket complete:		
18.74.1	100 mm	each	285.00
18.74.2	75 mm	each	208.00
18.75	Providing fixing and push on jointing sand cast iron S&S terminal guard as per IS: 3989 including EPDM rubber gasket complete:		
18.75.1	100 mm	each	301.00
18.75.2	75 mm	each	254.00
18.76	Providing and fixing on wall face or under floor UV stabilized Unplasticised Rigid PVC pipes (single socketed) having 3.2mm wall thickness conforming to IS : 13592 (4kg/sqcm) including required couplers, jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion etc complete.		
18.76.1	75 mm dia pipe.	metre	182.00
18.76.2	110 mm dia pipe.	metre	267.00
18.76.3	150 mm dia pipe.	metre	440.00
18.77	Providing and fixing on wall face UV stabilized Unplasticised - PVC moulded fittings/ accessories having 3.2mm wall thickness for Rigid PVC pipes conforming to IS : 13592 (heavy) jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.		
18.77.1	Tee/ Tee with door/ Bend 45°/ Bend 90°		
18.77.1.1	75 mm	each	113.00
18.77.1.2	110 mm	each	154.00
18.77.1.3	150 mm	each	273.00
18.77.2	Double "Y" with or without door		
18.77.2.1	75 mm	each	129.00
18.77.2.2	110 mm	each	224.00
18.77.3	Vent covel		
18.77.3.1	75 mm	each	34.00
18.77.3.2	110 mm	each	44.00
18.77.4	Access door cap		
18.77.4.1	75 mm	each	49.50
18.77.4.2	110 mm	each	59.00

Code No	Description	Unit	Rate Rs.
18.77.5	"P" trap 110mmx110mm long	each	227.00
18.77.6	Nahani trap 110x75mm	each	90.50
18.77.7	Multi floor trap 110	each	122.00
18.77.8	Plain reducing Tee 110x75mm	each	129.00
18.78	Providing and fixing UV stabilized Unplasticised -PVC pipe clips of approved design to Rigid PVC 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.		
18.78.1	75 mm	each	57.00
18.78.2	110 mm	each	61.00
18.79	Painting sand cast iron/ centrifugally cast (spun) iron soil, waste vent pipes and fittings with paint of any colour over a coat of primer (of approved quality) for new work :		
18.79.1	100 mm diameter pipe	metre	24.50
18.79.2	75 mm diameter pipe	metre	19.00
18.80	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 :		
18.80.1	100 mm diameter pipe	metre	12.50
18.80.2	75 mm diameter pipe	metre	9.10
18.81	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.		
18.81.1	Total bracket length 580mm of approved shape and design (for single, 100mm dia pipe).	each	136.00
18.81.2	Total bracket length 810mm of approved shape and design (for two, 100mm dia pipes).	each	173.00
18.81.3	Total bracket length 1040mm of approved shape and design (for three, 100mm dia pipes).	each	217.00

Note * **These items are to be executed only with prior permission of Chief Engineer**

19.0 WATER SUPPLY

A. TERMINOLOGY

(1) **Air gap:** The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or fitting supplying water to a tank or other device and the flood level rim of the receptacle in a water supply system.

(2) **Air Valve:** A valve that releases air from a pipe line automatically without loss of water, or introduces air into a pipe line automatically if the internal pressure becomes less than that of the atmosphere.

(3) **Available Head:** The head of water available at the point of consideration due to main's pressure or overhead tank or any other source of pressure.

(4) **Back flow:** The flow of water into the distributing pipes of water system from any source or sources other than its intended source.

(5) **Back siphonage:** The flowing back of used, contaminated or polluted water from a plumbing fitting or vessel into a water supply system due to a lowering of pressure in such system.

(6) **Branch:**

(i) A special form of cast iron pipe used for making connections to water mains. The various types are called T, Y, T-Y, double Y, and V branches, according to their respective shapes.
(ii) Any part of a piping system other than a main.

(7) **Capacity:** The storage capacity of a storage or flushing cistern or a tank when filled up to the water line.

(8) **Non return valve:** A device provided with a disc hinged on one edge so that it opens in the direction of normal flow and closes with reversal of flow.

(9) **Collar:** A pipe fitting in the form of a sleeve for jointing the spigot ends of two pipes in the same alignment.

(10) **Coupling:** A pipe fitting with inside threads only, used for connecting two pieces of pipe.

(11) **Cross:** A pipe fitting used for connecting four pipes at right angles.

(12) **Elbow:** A pipe fitting for providing a sharp change of direction in a pipe line.

(13) **Ferrule:** A pipe fitting for connecting a service pipe to a water main.

(14) **Fitting:** Anything fitted or fixed in connection with the supply, measurement, control, distribution, utilisation or disposal of water.

(15) **Fire Hydrant:** A device connected to a water main and provided with necessary valve and outlets, to which a fire hose may be attached for discharging water at a high rate for the purpose of extinguishing fires, washing down streets, or flushing out the water main.

(16) **Flange:** A projecting flat rim on the end of a valve, pipe etc.

(17) **Flanged Pipe:** A pipe provided with flanges so that the ends can be joined together by means of bolts.

(18) **Float Valve:** A valve in which the closure to an opening such as a plug or gate, is actuated by a float to control the flow into a tank.

(19) **Sluice Valve (Gate Valve):** A valve in which the flow of water is cut off by means of a circular disc., fitting against machine-smoothed faces, at right angles to the direction of flow. The disc is raised or lowered by means of a threaded stem connected to the handle of the valve, the opening in the valve is usually as large as the full bore of the pipe.

(20) **Nipple:** A tubular pipe fitting usually threaded on both ends and less than 300 mm long used for connecting pipes or fittings.

(21) **Offset:** A combination of elbows or bends which brings one section of the pipe out of line but into a line parallel with the other section in a piping system.

(22) **Reflux valve:** A non return valve used in a pipe line at a rising gradient to prevent water that is ascending the gradient from flowing back in the event of a burst lower down.

(23) **Socket:** The female part of the spigot and socket joint.

(24) **Spigot:** The male part of a spigot and socket joint.

(25) **Stop Cock:** A control valve fixed at the end of a communication pipe which controls the supply from the water main.

(26) **Storage tank:** A tank or a cistern for storage of water which is connected to the water main by means of a supply pipe.

(27) **Service or supply pipe :** Pipe through which supply is drawn from water mains.

(28) **Union:** A pipe fitting used for joining the ends of two pipes neither of which can be turned.

(29) **Valve:** A device used for controlling the flow of water in pipe line.

B) MATERIAL

(i) Polypropylene Randum Co-polymer (PP-R) pipe shall confirm to IS: 10951 and 10910.

(ii) Chlorinated Polyvinyle Chloride (CPVC) pipe shall confirm to IS: 15778.

(iii) All tubes/ pipes and accessories fittings such as bends, tees, elbows reducers, crosses, plugs, sockets, nipples and nuts, control valves, metres, air valves used shall be ISI marked and of make specified in contract or approved by department. All other material shall be ISI marked and if ISI marked is not available it shall confirm to BIS specification. The materials for which BIS specification is not available, approved make shall be used.

(iv) Pig Lead for pipe joints shall be bluish-grey in colour, soft and malleable, readily melted and free admixture of foreign matter.

(v) Teflon tap shall be of standard make.

C) LAYING

(i) All water supply installation work shall be carried out through licensed plumbers.

(ii) It is most important to ensure that wholesome water supply provided for drinking and culinary purposes, is in no way liable to contamination from any less satisfactory water. There shall, therefore, be no cross connection whatsoever between a pipe or fitting for conveying or containing wholesome water and a pipe or fitting for conveying or containing impure water or water liable to contamination or of uncertain quality of water which has been used for any purpose. The provision of reflux or non-return valves or closed and sealed valves shall not be construed a permissible substitute for complete absence of cross-connection.

(iii) No piping shall be laid or fixed so as to pass into, through or adjoining any sewer, scour outlet or drain or any manhole connected therewith nor through any ash-pit or manure-pit or any material of such nature that would be likely to cause undue deterioration of the pipe.

(iv) Where the laying of any pipe through fouled soil or previous material is unavoidable, the piping shall be properly protected from contact with such soil or material by being carried through an exterior cast iron tube or by some other suitable means. Any piping or fitting laid or fixed which does not comply with the above requirements, shall be removed and re-laid in conformity with the above requirements.

(v) Change in diameter and in direction shall preferably be gradual rather than abrupt to avoid undue loss of head. No bend or curve in piping shall be made so as to materially diminish or alter the cross-section.

(vi) Underground piping shall be laid at such a depth that it is unlikely to be damaged by frost or traffic loads and vibrations. It shall not be laid in ground liable to subsidence, but where such ground cannot be avoided, special precautions shall be taken to avoid damage to the piping. Where piping has to be laid across recently disturbed ground, the ground shall be thoroughly consolidated so as to provide a continuous and even support.

(vii) All pipe work shall be planned so that the piping is accessible for inspection, replacement and repair.

(viii) Any damage caused to the building, or to electric, sanitary water supply or other installations etc. therein either due to negligence on the part of the contractor, or due to actual requirements of the work, shall be made good and the building or the installations shall be restored to its original condition by the contractor. Nothing extra shall be paid for it, except where otherwise specified.

D) MEASUREMENTS:

(i) For C.I. pipes net length of pipes as laid or fixed shall be measured in the running metre correct to a cm excluding specials which shall be enumerated and paid for separately. The portion of the pipe within the collar at the joints shall not be included in the length of pipe work.

(ii) For G.I. pipe lengths of pipe line as laid or fixed shall be measured in running metre correct to a cm including G.I. fittings such as bends, tees, elbows reducers, crosses, plugs, sockets, nipples and nuts, but excluding brass or gun metal taps (cocks), valves, union, lead connection pipes and shower rose for the finished work.

(iii) The items having unit of measurement each, shall be enumerated and the quantity shall be taken in nos.

(iv) The items having unit of measurement quintal, shall be enumerated and multiplied by actual weight and quantity shall be calculated in quintal.

E) Rates:

The rate of water supply includes cost of all material, labour, hardware, T&P, wastages, scaffolding and hire & running charges of machinery etc. required to execute the work.

19.0 WATER SUPPLY

Code No	Description	Unit	Rate Rs.
19.1	Providing and fixing on wall surface 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 including fixing the pipe with clamps at 1.00 m spacing, testing of joints complete.		
19.1.1	PN - 16 Pipe, 16 mm OD	metre	102.00
19.1.2	PN - 16 Pipe, 20 mm OD	metre	139.00
19.1.3	PN - 16 Pipe, 25 mm OD	metre	188.00
19.1.4	PN - 16 Pipe, 32 mm OD	metre	269.00
19.1.5	PN - 16 Pipe, 40 mm OD	metre	389.00
19.1.6	PN - 16 Pipe, 50 mm OD	metre	569.00
19.2	Providing and fixing in concealed in wall 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 including fixing the pipe with clamps at 1.00 m spacing, cutting chases and making good the same, testing of joints complete.		
19.2.1	PN - 16 Pipe, 16 mm OD	metre	125.00
19.2.2	PN - 16 Pipe, 20 mm OD	metre	155.00
19.2.3	PN - 16 Pipe, 25 mm OD	metre	201.00
19.2.4	PN - 16 Pipe, 32 mm OD	metre	282.00
19.3	Providing and laying in trenches 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 including excavation of trenches, refilling the same and testing of joints complete.		
19.3.1	PN - 16 Pipe, 16 mm OD	metre	84.00
19.3.2	PN - 16 Pipe, 20 mm OD	metre	111.00

Code No	Description	Unit	Rate Rs.
19.3.3	PN - 16 Pipe, 25 mm OD	metre	155.00
19.3.4	PN - 16 Pipe, 32 mm OD	metre	227.00
19.3.5	PN - 16 Pipe, 40 mm OD	metre	324.00
19.3.6	PN - 16 Pipe, 50 mm OD	metre	483.00
19.3.7	PN - 16 Pipe, 63mm OD	metre	731.00
19.3.8	PN - 16 Pipe, 75 mm OD	metre	980.00
19.3.9	PN - 16 Pipe, 90 mm OD	metre	1474.00
19.3.10	PN - 10 Pipe, 110 mm OD (SDR - 11)	metre	1660.00
19.3.11	PN - 16 Pipe, 160 mm OD (SDR - 11)	metre	3423.00
19.4	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 testing of joints complete as per direction of Engineer in Charge.		
	INTERNAL WORK - EXPOSED ON WALL		
19.4.1	15 mm nominal outer dia .Pipes.	metre	110.00
19.4.2	20 mm nominal outer dia .Pipes.	metre	151.00
19.4.3	25 mm nominal outer dia .Pipes.	metre	199.00
19.4.4	32 mm nominal outer dia .Pipes.	metre	271.00
19.4.5	40 mm nominal outer dia .Pipes.	metre	362.00
19.4.6	50 mm nominal outer dia .Pipes.	metre	560.00
19.5	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.,		
19.5.1	15 mm nominal outer dia .Pipes.	metre	133.00
19.5.2	20 mm nominal outer dia .Pipes.	metre	167.00
19.5.3	25 mm nominal outer dia .Pipes.	metre	213.00
19.5.4	32 mm nominal outer dia .Pipes.	metre	284.00
19.6	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings. This included jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete		

Code No	Description	Unit	Rate Rs.
	as per direction of Engineer in Charge.		
	EXTERNAL WORK		
19.6.1	15 mm nominal outer dia pipes	metre	91.50
19.6.2	20 mm nominal outer dia pipes	metre	121.00
19.6.3	25 mm nominal outer dia pipes	metre	165.00
19.6.4	32 mm nominal outer dia pipes	metre	228.00
19.6.5	40 mm nominal outer dia pipes	metre	300.00
19.6.6	50 mm nominal outer dia pipes	metre	476.00
19.6.7	62.50 mm nominal inner dia pipes	metre	1192.00
19.6.8	75 mm nominal inner dia pipes	metre	1682.00
19.6.9	100mm nominal inner dia pipes	metre	2325.00
19.7	Providing and fixing on wall surface G.I. pipes medium class complete with G.I. fittings and clamps, including cutting, making good the walls etc. and testing of joints complete:		
19.7.1	15 mm dia. nominal bore	metre	149.00
19.7.2	20 mm dia. nominal bore	metre	185.00
19.7.3	25 mm dia. nominal bore	metre	258.00
19.7.4	32 mm dia. nominal bore	metre	318.00
19.7.5	40 mm dia. nominal bore	metre	364.00
19.7.6	50 mm dia. nominal bore	metre	471.00
19.8	Providing and fixing concealed in wall G.I. pipes medium class complete with G.I. fittings and clamps, including painting with anti corrosive bitumastic paint, cutting chases, making good the walls etc. and testing of joints complete:		
19.8.1	15 mm dia nominal bore	metre	188.00
19.8.2	20 mm dia nominal bore	metre	221.00
19.8.3	25 mm dia nominal bore	metre	297.00
19.9	Providing and laying in trenches G.I. pipes medium class complete with G.I. fittings including excavation of trenches, refilling the same and testing of joints complete:		
19.9.1	15 mm dia. nominal bore	metre	131.00
19.9.2	20 mm dia. nominal bore	metre	159.00
19.9.3	25 mm dia. nominal bore	metre	222.00
19.9.4	32 mm dia. nominal bore	metre	272.00
19.9.5	40 mm dia. nominal bore	metre	308.00
19.9.6	50 mm dia. nominal bore	metre	398.00

Code No	Description	Unit	Rate Rs.
19.9.7	65 mm dia. nominal bore	metre	502.00
19.9.8	80 mm dia. nominal bore	metre	639.00
19.10	Making connection of G.I. distribution branch in G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete: (dia of main line to be measured)		
19.10.1	25 mm nominal bore	each	200.00
19.10.2	32 mm nominal bore	each	224.00
19.10.3	40 mm nominal bore	each	278.00
19.10.4	50 mm nominal bore	each	347.00
19.10.5	65 mm nominal bore	each	486.00
19.10.6	80 mm nominal bore	each	632.00
19.11	Providing and fixing G.I. Union in G.I. pipe (New work) including cutting and threading the pipe and making long screws etc. complete:		
19.11.1	15 mm nominal bore	each	85.00
19.11.2	20 mm nominal bore	each	98.00
19.11.3	25 mm nominal bore	each	117.00
19.11.4	32 mm nominal	each	148.00
19.11.5	40 mm nominal bore	each	169.00
19.11.6	50mm nominal bore	each	250.00
19.11.7	65mm nominal bore	each	486.00
19.11.8	80 mm nominal bore	each	529.00
19.12	Providing and fixing G.I. Union 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 :		
19.12.1	15 mm nominal bore.	each	186.00
19.12.2	20 mm nominal bore.	each	199.00
19.12.3	25 mm nominal bore.	each	218.00
19.12.4	32 mm nominal bore.	each	248.00
19.12.5	40 mm nominal bore.	each	270.00
19.12.6	50 mm nominal bore.	each	388.00
19.12.7	65 mm nominal bore.	each	538.00
19.12.8	80 mm nominal bore.	each	667.00
19.13	Providing and fixing 15 mm nominal bore Brass bib/stop cock of approved quality:		
19.13.1	Bib cock (250 grams)	each	185.00

Code No	Description	Unit	Rate Rs.
19.13.2	Bib cock (350 grams)	each	237.00
19.13.3	Stop cock (350 grams)	each	237.00
19.14	Providing and fixing 15 mm nominal bore C.P. brass fittings of approved make and conforming to IS:8931 including C.P. brass extension if required:		
19.14.1	Bib cock (400 grams)	each	382.00
19.14.2	Long nose bib cock (500 grams)	each	455.00
19.14.3	Long body bib cock (500 grams)	each	426.00
19.14.4	Piller Cock (400 grams)	each	398.00
19.14.5	Two way bib cock (800 grams)	each	708.00
19.14.6	Stop cock (concealed) (600 grams)	each	494.00
19.14.7	Angle valve for basin mixer and geyser points (450 grams)	each	382.00
19.14.8	Basin mixer pillar tap with spout (1000 grams)	each	1248.00
19.14.9	Kitchen sink mixer with cast swivel spout (1000 grams)	each	1248.00
19.14.10	Wall mixer with elegant knob (1400 grams)	each	1787.00
19.14.11	Hand shower set with flexible extension pipe	each	754.00
19.14.12	Bottle trap set with extension pipes	each	473.00
19.14.13	Toilet paper holder	each	248.00
19.14.14	Soap dish plate	each	163.00
19.14.15	Shower rose (revolving type) (150mm)	each	269.00
19.14.16	Towel rail (600mm long x 20mm dia)	each	338.00
19.14.17	Towel ring (150 mm dia)	each	254.00
19.14.18	Wall mixer (telephonic type) with crutch arrangement for hand shower (1400gms)	each	1764.00
19.14.19	Health foscet (hand jet) with flexible connection pipe (for WC)	set	774.00
19.14.20	CP brass water jet to be fixed in seat cover of WC with flexible connection pipe	set	577.00
19.15	Providing and fixing stainless steel drain jali of approved make/quality.	each	51.00
19.16	Providing and fixing brass/ gun metal gate valve with C.I. wheel of approved quality (screwed end):		
19.16.1	25 mm nominal bore	each	436.00
19.16.2	32 mm nominal bore.	each	510.00
19.16.3	40 mm nominal bore	each	596.00
19.16.4	50 mm nominal bore	each	762.00
19.16.5	65 mm nominal bore	each	1302.00
19.16.6	80 mm nominal bore	each	1935.00

Code No	Description	Unit	Rate Rs.
19.17	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :		
19.17.1	15 mm nominal bore	each	284.00
19.17.2	20 mm nominal bore	each	394.00
19.17.3	25 mm nominal bore	each	432.00
19.18	Providing and fixing gun metal non- return valve (horizontal type) of approved quality (screwed end) :		
19.18.1	25 mm nominal bore	each	413.00
19.18.2	32 mm nominal bore	each	556.00
19.18.3	40 mm nominal bore	each	688.00
19.18.4	50 mm nominal bore	each	993.00
19.18.5	65 mm nominal bore	each	1776.00
19.18.6	80 mm nominal bore	each	2513.00
19.19	Providing and fixing gun metal non- return valve (vertical type) of approved quality (screwed end) :		
19.19.1	25 mm nominal bore	each	451.00
19.19.2	32 mm nominal bore	each	608.00
19.19.3	40 mm nominal bore	each	753.00
19.19.4	50 mm nominal bore	each	1088.00
19.19.5	65 mm nominal bore	each	1948.00
19.19.6	80 mm nominal bore	each	2758.00
19.20	Providing and fixing brass ferrule with C.I. mouth cover including boring and tapping the main :		
19.20.1	15 mm nominal bore	each	202.00
19.20.2	20 mm nominal bore	each	250.00
19.20.3	25 mm nominal bore	each	333.00
19.21	Painting G.I. pipes and fittings with synthetic enamel white paint over a red oxide zinc chromate priming coat, both of approved quality for new work:		
19.21.1	15 mm diameter pipe.	metre	6.60
19.21.2	20 mm diameter pipe.	metre	7.70
19.21.3	25 mm diameter pipe.	metre	9.50
19.21.4	32 mm diameter pipe.	metre	11.50
19.21.5	40 mm diameter pipe.	metre	13.50
19.21.6	50 mm diameter pipe.	metre	16.50

Code No	Description	Unit	Rate Rs.
19.22	Repainting G.I. pipes and fittings with synthetic enamel white paint of approved quality:		
19.22.1	15 mm diameter pipe.	metre	2.90
19.22.2	20 mm diameter pipe.	metre	3.40
19.22.3	25 mm diameter pipe	metre	4.50
19.22.4	32 mm diameter pipe	metre	5.40
19.22.5	40 mm diameter pipe	metre	6.40
19.22.6	50 mm diameter pipe	metre	7.50
19.23	Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality:		
19.23.1	15 mm diameter pipe	metre	3.90
19.23.2	20 mm diameter pipe	metre	4.60
19.23.3	25 mm diameter pipe	metre	5.90
19.23.4	32 mm diameter pipe	metre	7.40
19.23.5	40 mm diameter pipe	metre	8.50
19.23.6	50 mm diameter pipe	metre	10.50
19.23.7	65 mm diameter pipe	metre	13.00
19.23.8	80 mm diameter pipe	metre	15.00
19.24	Providing and filling fine sand or coarser grade all-round the G.I. pipes in external work.		
19.24.1	15 mm diameter pipe	metre	33.50
19.24.2	20 mm diameter pipe	metre	34.00
19.24.3	25 mm diameter pipe	metre	34.50
19.24.4	32 mm diameter pipe	metre	35.50
19.24.5	40 mm diameter pipe	metre	37.00
19.24.6	50 mm diameter pipe	metre	38.00
19.24.7	65 mm diameter pipe	metre	58.00
19.24.8	80 mm diameter pipe	metre	59.50
19.24.9	100 mm diameter pipe	metre	64.00
19.24.10	150 mm diameter pipe	metre	95.00
19.25	Providing and laying S&S centrifugally cast (spun) iron pipes (Class LA) conforming to IS - 1536 :		
19.25.1	100 mm dia. pipe	metre	1056.00
19.25.2	125 mm dia. pipe	metre	1315.00
19.25.3	150 mm dia. pipe	metre	1586.00
19.25.4	200 mm dia. pipe	metre	2695.00

Code No	Description	Unit	Rate Rs.
19.26	Providing and laying S&S C.I. Standard specials such as tees, bends, collars tapers and caps etc, suitable for flanged jointing as per IS : 1538 :		
19.26.1	Upto 300 mm dia	quintal	6464.00
19.27	Providing and laying flanged C.I. standard specials such as tees, bends, collars, tapers, caps etc., suitable for flanged jointing as per IS : 1538 :		
19.27.1	Upto 300 mm dia.	quintal	6522.00
19.28	Providing and laying S&S C.I. Standard specials suitable for mechanical jointing as per IS : 13382		
19.28.1	Upto 300 mm dia	quintal	9641.00
19.29	Providing and laying D.I. specials of class K-12 suitable for push-on jointing as per IS : 9523		
19.29.1	Upto 300 mm dia	quintal	15185.00
19.30	Providing and laying D.I. Specials of Class K - 12 suitable for mechanical jointing as per IS : 9523 :		
19.30.1	Upto 300 mm dia	quintal	15993.00
19.31	Providing and placing in position C.I. sluice valves category “A” (Make: Kirloskar Bros. Ltd., Indian Valve Co. (IVC), Fouress Engineers Pvt. Ltd., WAG) (with cap) complete:		
19.31.1	100 mm diameter	each	3429.00
19.31.2	125 mm diameter	each	4110.00
19.31.3	150 mm diameter	each	5041.00
19.31.4	200 mm diameter	each	10712.00
19.32	Providing and placing in position C.I. sluice valves category “B” (Makes / vendors other then Category "A" will be considered in category “B”) (with cap) complete:		
19.32.1	100 mm diameter	each	2851.00
19.32.2	125 mm diameter	each	3071.00
19.32.3	150 mm diameter	each	4233.00
19.32.4	200 mm diameter	each	8737.00
19.33	Providing lead caulked joints to S.C.I or C.I. (spun) pipes and specials including testing of joints but excluding the cost of pig lead:		
19.33.1	100 mm diameter pipe	each	115.00
19.33.2	125 mm diameter pipe	each	169.00
19.33.3	150 mm diameter pipe	each	173.00
19.33.4	200 mm diameter pipe	each	230.00
19.34	Supplying pig lead at site of work.	quintal	14438.00

Code No	Description	Unit	Rate Rs.
19.35	Providing flanged joints to double flanged C.I./ D.I. pipes, valves and specials including rubber insertion 3mm thick, suitable bolts and nuts and testing of joints complete:		
19.35.1	80 mm diameter pipe	each	70.50
19.35.2	100 mm diameter pipe	each	112.00
19.35.3	125 mm diameter pipe	each	139.00
19.35.4	150 mm diameter pipe	each	193.00
19.35.5	200 mm diameter pipe	each	215.00
19.35.6	250 mm diameter pipe	each	309.00
19.36	Providing push-on-joints to Centrifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes including testing of joints and including the cost of rubber gasket :		
19.36.1	100 mm dia pipes	joint	53.00
19.36.2	150 mm dia pipes	joint	71.50
19.36.3	200 mm dia pipes	joint	113.00
19.36.4	250 mm dia pipes	joint	136.00
19.37	Providing and placing in position C.I. double acting air valve of approved make.		
19.37.1	50 mm dia	each	4634.00
19.37.2	80 mm dia	each	6020.00
19.37.3	100 mm dia	each	7868.00
19.38	Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by Municipal Board complete with bolts, nuts, rubber insertions etc. (The tail pieces if required will be paid separately) :		
19.38.1	80 mm dia nominal bore	each	10322.00
19.38.2	100 mm dia nominal bore	each	14892.00
19.38.3	150 mm dia nominal bore	each	23592.00
19.38.4	200 mm dia nominal bore	each	28645.00
19.39	Providing and fixing C.I. dirt box strainer for bulk type water meter with nuts, bolts, rubber insertions etc. complete conforming to IS : 2373 :		
19.39.1	80 mm dia	each	3799.00
19.39.2	100 mm dia	each	5506.00
19.39.3	150 mm dia	each	7074.00
19.39.4	200 mm dia	each	9737.00
19.40	Dismantling old C.I. pipes including excavation and refilling trenches after taking out the pipes, breaking lead caulked joints, melting of lead and making into blocks including stacking of pipes at site lead upto 50 metre :		

Code No	Description	Unit	Rate Rs.
19.40.1	80 mm dia C.I. pipe	metre	131.00
19.40.2	100 mm dia C.I. pipe	metre	135.00
19.40.3	125 mm dia C.I. pipe	metre	139.00
19.40.4	150 mm dia C.I. pipe	metre	142.00
19.40.5	200 mm dia C.I. pipe	metre	157.00
19.41	Labour for cutting C.I. pipe with steel saw.		
19.41.1	80 mm dia C.I. pipe	each cut	32.00
19.41.2	100 mm dia C.I. pipe	each cut	41.50
19.41.3	125 mm dia C.I. pipe	each cut	59.50
19.41.4	150 mm dia C.I. pipe	each cut	78.00
19.41.5	200 mm dia C.I. pipe	each cut	101.00
19.42	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank	litre	7.30
19.43	Cutting holes more than 20x20 cm and upto 30x30 cm in walls including making good the same :	each	125.00
19.44	Cutting holes upto 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 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including finishing complete so as to make it leak proof.	each	94.00
19.45	Making chases upto 7.5x7.5 cm in walls including making good and finishing with matching surface after housing G.I. pipe etc.	metre	46.00
19.46	Making hole upto 20x20 cm and embedding pipes upto 150 mm diameter in masonry and filling with cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) including disposal of malba.	metre	67.50
19.47	Constructing masonry Chamber 30x30x50 cm, inside with modular well burnt clay bricks of 35 kg/ cm² in cement mortar 1:4 (1 cement : 4 coarse sand) for stop cock, with C. I. surface box 100x100 x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12mm thick finished with a floating coat of neat cement complete as per standard design :	each	754.00
19.48	Constructing masonry Chamber 60x60x75 cm, inside with modular well burnt clay bricks of 35 kg/ cm² in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm. top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate	each	4644.00

Code No	Description	Unit	Rate Rs.
	20mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) 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 :		
19.49	Constructing masonry Chamber 90x90x100 cm, inside with modular well burnt clay bricks of 35 kg/ cm² 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 and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) 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	8013.00
19.50	Constructing masonry Chamber 120x120x100 cm, inside with modular well burnt clay bricks of 35 kg/ cm² 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 and RCC top slab 1:2:4 mix (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) 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	11021.00
19.51	Constructing masonry Chamber 60x60x75 cm, inside with modular well burnt clay bricks of 35 kg/ cm² 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 and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) 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	4356.00
19.52	Constructing masonry Chamber 60x45x50 cm, inside with modular well burnt clay bricks of 35 kg/ cm² 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 and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine sand :10 graded stone aggregate 40 mm nominal size) 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	4133.00

20.0 DRAINAGE

A) TERMINOLOGY

(1) **Benching:** The sloped floor of a manhole or an inspection chamber on both sides and above the top of the channel.

(2) **Channel:** The open waterway through which sewage, storm water or other liquid waste flow at the invert of a manhole or an inspection chamber.

(3) **Cleaning Eye:** An access opening having a removable cover to enable obstructions to be cleared by means of a drain rod.

(4) **Connections:** The junction of a foul water drain, surface water drain with public sewer, cesspool soak-way or other water courses.

(5) **Curb, Kerb:** The stone margin of a side walk.

(6) **Dispersion Trench:** A trench in which open jointed pipes surrounded by coarse aggregate media and overlaid by fine aggregate, are laid. The effluent from septic tank gets dispersed through the open joints and is absorbed in the surrounding soil.

(7) **Depth of Manhole:** The vertical distance from the top of the manhole to the outgoing invert of the main drain channel.

(8) **Drain:** A line of pipes including all fittings and equipment, such as manholes traps, gullies and floor traps used for the drainage of a building, or a number of buildings or yards appurtenant to the buildings, within the same cartilage. Drain shall also include open channels used for conveying surface water.

(9) **Drainage:** The removal of any liquid by a system constructed for the purpose.

(10) **Drop connection:** A branch drain of which the last length of piping of the incoming drain, before connection to the sewer, is vertical.

(11) **Drop Manhole:** A manhole incorporating a vertical drop for the purpose of connecting a sewer or drain at high level to one at lower level.

(12) **Effluents**

a) **Tank effluent:** The supernatant liquid discharge from a septic tank.
b) **Filter effluent:** The liquid discharged from a biological filter.

(13) **Gully Chamber:** The chamber built of masonry around a gully trap, for housing the same.

(14) **Gully Trap:** A trap water seal provided in a drainage system in a suitable position to collect waste water from the scullery, kitchen sink, wash basins, baths and rain water pipes.

(15) **Haunching:** Concrete bedding with additional concrete at the sides of the pipe.

(16) **Junction pipe:** A pipe incorporating one or more branches.

(17) **Invert:** The lowest point of the interior or a sewer or drain at any cross action.

(18) **Inspection Chamber:** A water tight chamber constructed in any house drainage system which takes wastes from gully traps and disposes off to manhole with access for inspection and maintenance.

(19) **Interceptor Manhole (interceptor chamber):** A manhole incorporating an intercepting trap, and providing means of access thereto and equipped with a fresh air inlet on the upstream side of the trap.

(20) **Manhole (Manhole Chamber):** Any chamber constructed on a drain or sewer so as to provide access thereto for inspection testing or the clearance of obstruction.

(21) **Rest Bend (Duck Foot Bend):** A bend supported in a vertical position by a foot formed at its base.

(22) **Saddle:** A purpose made fitting, so shaped as to fit over a hole cut in a sewer or drain, and used to form connections.

(23) **Soffit:** The highest portion of the interior of a sewer or drain at any cross-section.

(24) **Soil waste:** The discharge from water closets, urinals, slope sinks, stable or cowshed gullies and similar appliances.

(25) **Soil pipe:** Which receives the discharges from soil fitments, such as water closets urinals, and slope sinks.

(26) **Sullage Waste Water:** Spent water from baths, wash basins kitchen sinks, and similar appliances which does not contain human or animal excreta.

(27) **Sewer:** A closed drain carrying night soil and other water borne waste.

(28) **Surface Water Drain:** A drain conveying surface water including storm water.

(29) **Surface Water:** The run off from precipitation, other water that flows over surface of the ground.

(30) **Sub Soil Water:** Water occurring naturally below the surface of the ground.

(31) **Sludge:** The settled solid matter in semi solid condition.

(32) **Soak Pit (seepage pit soak-way):** A pit through which effluent is allowed to seep or leach into the surrounding soil.

(33) **Septic Tank:** A water tight single storeyed tank in which sewage is retained sufficiently long to permit sedimentation of suspended solids and partial digestion of settled sludge by anaerobic bacteria.

(34) **Scum:** The greasy and other substances floating on the surface of sewage.

(35) **Vent Pipe:** A pipe line installed to provide flow of air to or from a drainage system or to provide circulation of air within such system to protect trap seals from siphonage and back flow.

(36) **Waste Water:** The discharge from wash basins, sinks and similar appliance, which does not contain human excreta.

B) MATERIALS

Sand cast iron spigot and socket soil waste and ventilating pipes, fittings and accessories concrete pipes (with/ without Reinforcement) salt glazed stoneware pipes and fittings, cast iron Manhole covers and frames shall be ISI marked and of make specified in contract or approved by department. All material shall be ISI marked and if ISI marked is not available it shall confirm to BIS specification. The materials for which BIS specification is not available, approved make shall be used.

C) LAYING

(i) 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.

(ii)

GRADIENTS FOR SEWERS

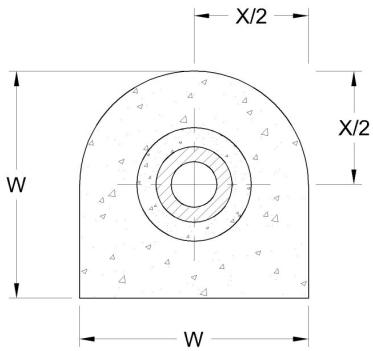
Diameter mm	Minimum Gradient		Maximum Gradient	
	Gradient	Discharge Cum/Min.	Gradient	Discharge Cum/Min.
100	1 in 57	0.18	1 in 5.6	0.59
150	1 in 100	0.42	1 in 9.7	1.32
200	1 in 145	0.73	1 in 14	2.4
230	1 in 175	0.93	1 in 17	2.98
250	1 in 195	1.10	1 in 19	3.60
300	1 in 250	1.70	1 in 24.5	5.30

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 on no account be less than 0.61 metres per second.

(iii) On the other hand, it is undesirable to employ gradients giving velocity of flow greater than 2.4 metres per second. Where it is unavoidable, cast iron pipes shall be used. The approximate gradients which give a velocity of 2.4 metres per second.

(iv) In case where foundation conditions are unusual such as in the proximity of trees or holes, under existing or proposed tracks manholes etc. the pipe shall be encased all-around in 15 cm thick cement concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) or compacted sand or gravel.

(v) Joints are generally of rigid type. Where specified flexible type joints may also be provided.



Concrete all around SW pipe (Item No 20.2)

W = D+X, Where D is the External Diametre of the pipe in mm

X = 300 mm up to Trench Depth of 1200 mm
400 mm Trench Depth more than 1200 mm

D) TESTING :

Pipe joints shall be tested to a test pressure of 2.5 m head of water at the highest point of the section under test. The test shall be carried out by suitably plugging the lower end of the drain and the ends of the connection if any and filling the system with water. A knuckle bend shall be temporarily jointed in at the top end and a sufficient length of vertical pipe jointed to it so as to provide the required test head, or the top may be plugged with a connection to a hose ending in a funnel which could be raised or lowered till the required head is obtained and fixed suitable for observation. If any leakage is visible, the defective part of the work shall be cut out and made good.

E) MEASUREMENTS:

(i) The lengths of pipes shall be measured in running metres 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 over all fittings such as bends, junctions, etc. which shall not be measured separately.

(ii) Manholes shall be enumerated under relevant items. The depth of the manhole shall be reckoned from the top level of cover to the invert level of channel. The depth shall be measured correct to a cm. The extra depth shall be measured and paid as extra over the specified depth.

(iii) The items having unit of measurement each, shall be enumerated.

F) RATES:

The rate of this chapter includes cost of all material, labour, hardware, T&P, wastages and hire & running charges of machinery etc. required to execute the work.

20.0 DRAINAGE

Code No	Description	Unit	Rate Rs.
20.1	Providing, laying and jointing glazed stoneware pipes grade 'A' with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :		
20.1.1	100 mm diameter	metre	162.00
20.1.2	150 mm diameter	metre	262.00
20.1.3	200 mm diameter	metre	506.00
20.2	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round S.W. pipes including bed concrete 150mm thick as per standard design:		
20.2.1	100 mm diameter S.W. pipe	metre	357.00
20.2.2	150 mm diameter S.W. pipe	metre	436.00
20.2.3	200 mm diameter S.W. pipe	metre	508.00

Code No	Description	Unit	Rate Rs.
20.3	Providing and fixing square-mouth S.W. gully trap grade 'A'' complete with C.I. grating brick masonry chamber with well burnt modular clay bricks crushing strength not less than 35kg/cm2, 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 :		
20.3.1	100x100 mm size P type	each	1339.00
20.3.2	150 x 100 mm size P type.	each	1397.00
20.3.3	180x150 mm size P type	each	1504.00
20.4	Dismantling of old S.W. pipes including breaking of joints and bed concrete stacking of useful materials near the site within 50 m lead but beyond 20m and disposal of unserviceable materials:		
20.4.1	100 mm diameter	metre	18.50
20.4.2	150 mm diameter	metre	21.00
20.4.3	200 mm diameter	metre	22.00
20.5	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 :		
20.5.1	100 mm dia. R.C.C. pipe	metre	309.00
20.5.2	150 mm dia. R.C.C. pipe	metre	353.00
20.6	Providing, lowering, laying, aligning, fixing in position at and jointing at all level/ depths ISI marked HDPE pipes of PE-100 grade and PN 6 for sewer application as per IS 14333-1996 (amended upto date) in trenches in complete including all material, labour, testing and commissioning as per direction of Engineer. Note : E/w to be measured and paid separately.		
20.6.1	100 mm dia	metre	366.00
20.6.2	150 mm dia	metre	771.00
20.6.3	200 mm dia	metre	1165.00
20.7	Constructing brick masonry manhole with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand), R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation in cement concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design :		
20.7.1	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	6703.00

Code No	Description	Unit	Rate Rs.
20.7.2	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	14448.00
20.7.3	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	18977.00
20.7.4	Inside size 90x80 cm and 45 cm deep including RCC cover with frame 450x600 mm internal dimensions.	each	5595.00
20.7.5	Inside size 120x90 cm and 90 cm deep including RCC cover with frame 500 mm internal diameter.	each	9182.00
20.8	Extra for depth for manholes		
20.8.1	Size 90x80 cm	metre	3755.00
20.8.2	Size 120x90 cm	metre	4473.00
20.9	Providing and constructing brick masonry circular arch type manhole upto 1.67m depth, 0.91m internal dia at bottom and 0.56m dia at top having brick masonry wall 190mm thick with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand), in side cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement, foundation concrete 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 40mm nominal size), and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement, providing and fixing 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, in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) all complete as per standard design (excavation and foot rests shall be paid for separately) :		
20.9.1	Manhole of depth 0.91m.	each	5970.00
20.10	Providing and constructing extra depth for circular type manhole 0.91m internal dia (at bottom) beyond 0.91m and upto 1.67m	metre	3027.00
20.11	Providing M.S. foot rests including fixing in manholes with 20x20x10 cm cement concrete blocks 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) as per standard design:		
20.11.1	With 20x20 mm square bar	each	168.00
20.11.2	With 20 mm diameter round bar	each	135.00
20.12	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	each	171.00

Code No	Description	Unit	Rate Rs.
	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 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.		
20.13	Replacement of M.S. foot rests in manholes including dismantling concrete blocks and fixing with 20x20x10 cm cement concrete blocks 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) :		
20.13.1	With 20x20 mm square bar	each	224.00
20.13.2	With 20 mm diameter round bar	each	191.00
20.14	Supplying and fixing C.I. cover without frame for manholes :		
20.14.1	455x610 mm rectangular C.I. cover (light duty) the weight of the cover to be not less than 23 kg.	each	1222.00
20.14.2	500 mm diameter C.I. cover (medium duty) the weight of the cover to be not less than 58 kg.	each	3041.00
20.14.3	560 mm diameter C.I. cover (heavy duty) the weight of the cover to be not less than 108 kg.	each	5648.00
20.15	Providing and fixing in position precast R.C.C. manhole cover and frame L D- 2.5 of required shape and approved quality		
20.15.1	Rectangular shape 600x450mm internal dimensions	each	1031.00
20.15.2	Square shape 450mm internal dimensions	each	880.00
20.15.3	Circular shape 450mm internal diameter	each	788.00
20.16	Providing and fixing in position precast R.C.C. manhole cover and frame M D- 10 of required shape and approved quality		
20.16.1	Square shape 450mm internal dimension	each	967.00
20.16.2	Circular shape 500mm internal diameter	each	896.00
20.17	Providing and fixing in position precast circular 560mm internal dia SFRC/ R.C.C. manhole cover or cover and frame of approved quality:		
20.17.1	Cover and frame H D - 20	each	1437.00
20.17.2	Cover and frame EHD - 35	each	1567.00
20.17.3	Cover only H D - 20	each	1120.00
20.17.4	Cover only EHD - 35	each	1236.00
20.18	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	266.00

Code No	Description	Unit	Rate Rs.
20.19	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement and making necessary channels for the drain etc. complete :		
20.19.1	For pipes 100 to 230 mm diameter	each	207.00
20.19.2	For pipes 250 to 300 mm diameter	each	217.00
20.19.3	For pipes 350 to 450 mm diameter	each	892.00
20.20	Providing sand cast iron drop connection externally for 60 cm drop from branch sewer line to main sewer manhole including inspection and cleaning eye with chain and lid, sand cast iron drop pipe and bend encased all-round with cement concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) with all centring and shuttering required, cutting holes in walls and making good with brick work in cement mortar 1:4 (1 cement : 4 coarse sand) plastered with cement mortar 1:3 (1 cement : 3 coarse sand) on inside of the manhole wall lead caulked joints between sand cast iron pipes and fittings, stiff cement mortar 1:1 (1 cement : 1 fine sand) joints between sand cast iron tee and S.W. pipe, making required channels complete as per standard design and specifications :		
20.20.1	100 mm dia. sand cast iron drop connection	each	4278.00
20.20.2	150 mm dia. sand cast iron drop connection	each	6495.00
20.21	Extra for depths beyond 60 cm of sand cast iron drop connection complete :		
20.21.1	For 100 mm dia. sand cast iron drop connection	metre	1426.00
20.21.2	For 150 mm dia. sand cast iron drop connection	metre	2211.00
20.22	Dismantling 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 into municipal dumps within 50 m lead :		
20.22.1	Rectangular manhole 90x80 cm and 45 cm deep	each	490.00
20.22.2	Rectangular manhole 120x90 cm and 90 cm deep	each	777.00
20.22.3	Rectangular arch type manhole 140x90cm and 2.45m deep	each	1187.00
20.22.4	Circular manhole 1.22m diameter and 1.68 m deep	each	1163.00
20.23	Dismantling of manhole for extra for depth of manholes dismantled:		
20.23.1	Rectangular manhole 90x80 cm beyond 45 cm depth	metre	287.00
20.23.2	Rectangular manhole 120x90 cm beyond 90 cm depth	metre	337.00
20.23.3	Rectangular arch type manhole 140x90 cm beyond 2.45m and upto 4.25 m depth	metre	285.00
20.23.4	Circular manhole 1.22m diameter beyond 1.68 m and upto 2.29 m depth	metre	291.00

Code No	Description	Unit	Rate Rs.
20.24	Raising manhole with cover and frame slab to required level including dismantling existing slab, taking out the existing CI frame & cover of manhole and raising it upto ground/ road level, refixing of frame and cover in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 crushed stone aggregate 20mm) all around the frame, including making good the damage, form work, curing, complete. (Brick work of raising depth of manhole to be paid separately)		
20.24.1	Rectangular manhole 90x80 cm with rectangular cover 600x450 mm of grade LD - 2.5	each	851.00
20.24.2	Rectangular manhole 120x90 cm with circular cover 500 mm dia of grade MD - 10	each	1341.00
20.24.3	Rectangular manhole 120x90 cm with circular cover 560 mm dia of grade HD - 20	each	1245.00
20.24.4	Circular manhole 140 cm dia with circular cover 600 mm dia of grade EHD - 35	each	1352.00
20.25	Providing and constructing brick masonry road gully chamber 50x45x60 cm with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm precast R.C.C. horizontal grating with frame complete as per standard design.	each	2872.00
20.26	Providing and constructing brick masonry road gully chamber 45x45x77.5 cm with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand) with precast R.C.C. vertical grating complete as per standard design.	each	3011.00
20.27	Providing and constructing brick masonry road gully chamber 110x50x77.5 cm with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm precast R.C.C. horizontal grating with frame and vertical grating complete as per standard design.	each	5213.00
20.28	Providing and constructing brick masonry chamber for underground pipe and and bends with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) R.C.C. top slab with 1:2:4 mix (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design :		
20.28.1	Inside dimensions 455x610 mm and 45 cm deep for single pipe line :	each	3796.00
20.28.2	Inside dimensions 500x700 mm and 45 cm deep for pipe line with one or two inlets :	each	4357.00
20.28.3	Inside dimensions 600x 850 mm and 45 cm deep for pipe line with three or more inlets :	each	4894.00

Code No	Description	Unit	Rate Rs.
20.29	Providing and constructing brick masonry chamber for underground pipe and bends with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand) RCC cover of suitable size and 75mm thick with 1:1.5:3 mix (1 cement :1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) including reinforcement 8mm dia bars at 150mm both ways and MS hooks for lifting, including foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design :		
20.29.1	Inside dimensions 450x600 mm and 45 cm deep for single pipe line :	each	1530.00
20.29.2	Inside dimensions 500x700 mm and 45 cm deep for pipe line with one or two inlets :	each	1703.00
20.29.3	Inside dimensions 600x 850 mm and 45 cm deep for pipe line with three or more inlets :	each	2619.00
20.30	Providing and constructing brick work for extra depth beyond 45 cm of brick masonry chamber with well burnt modular clay bricks crushing strength not less than 35kg/cm2 in cement mortar 1:4 (1 cement : 4 coarse sand) with inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished smooth with a floating coat of neat cement on walls:		
20.30.1	For 455x610 mm size	metre	2616.00
20.30.2	For 500x700 mm size	metre	2853.00
20.30.3	For 600x850 mm size	metre	3322.00
20.31	Providing and 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.	each	1709.00
20.32	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 :		
20.32.1	100 mm dia	each	393.00
20.32.2	150 mm dia	each	610.00

21.0 TUBE WELL & RAIN WATER HARVESTING

1. Items which are frequently required related to tubewells have been incorporated in this chapter of building S.O.R.

Some items of Rain water harvesting have been incorporated in this chapter of building S.O.R.

2. Tube wells drilled shall be perfectly vertical. The rates for drilling are inclusive of the verticality test required to be conducted. All the relevant Indian standards and specifications of the B.I.S. shall also be applicable.

3. The rates for drilling provided in this chapter are inclusive of charges of all the machinery, tools & plants required for drilling operation, transportation of drilling machine, erection of machine at site, removal of machine from site after completion, cost of water ,cost of drilling, fuel, labour and all other unforeseen items for drilling work and clearance of site after completion of work.

4. For locating the proper site for tube well construction within the selected habitation, if resistivity survey is required then the resistivity survey shall be carried out by a well qualified and experienced geohydrologist using his own suitable resistivity meter.

5. In all types of tube wells casing pipe of specified diameter shall be lowered up to a minimum depth of 9 meters below ground level, If the collapsible strata in overburden continue beyond 9 meters depth then the casing pipe shall be lowered up to rock level and embedded in rock in a depth of 0.15 meter. The casing pipe shall also be extended above ground level in a height of about 0.3 meter .

6. The diameter of ordinary tube wells constructed for installation of hand pumps shall be 125mm up to bottom level of the casing pipe and 115 mm in the rock below the casing. Such tube wells shall be designated as 125/115 mm dia ordinary tube wells.

7. The nominal diameter of ordinary tube wells constructed for installation of power pumps shall be 150 mm for the entire depth depending up on the type and size to be installed in the tube well. Such tube wells shall be designated as 150mm dia ordinary tube well .

8. The gravel packed tube wells shall be constructed in alluvial formations, suitable for such tube wells, in which the fine and uniform sand is present in the water bearing aquifer. Such tube wells shall be constructed by direct circulation rotary drilling method or reverse circulation rotary drilling method using suitable rotary drilling machine.

9. The Gravel packed tube wells shall be constructed only after obtaining the technical clearance of drawing & design of gravel packed tube well from the Chief Engineer.

10. The rates are inclusive of the preparation and submission of strata chart of the tube well constructed in the prescribed Performa.

11. It shall be the responsibility of the contractor to collect the water sample from completed tube well and send it to departmental laboratory for chemical and bacteriological analysis. The water sample for chemical analysis shall be collected in 2 litres plastic bottle and samples for bacteriological analysis shall be collected in 300 ml sterilized bottle as per the direction of Engineer in Charge, only testing charges will be borne by the department.

12. All risks of accidents and jamming and breaking of drilling tools etc. shall be contractor's liability. No extra charges shall be payable to the contractor on this account.

13. Contractor shall also make arrangements of first aid facilities for any accident. All care and precautions shall be taken and it shall be ensured that there shall be no accidents while drilling the borehole. Proper dress and equipments like gumboots, helmets etc. shall be provided by the contractor to the workmen at site.

14. During any operation carried out for construction of tube well, if any tool, pipe etc. falls down in the tube well then the contractor shall carry out the necessary fishing operation at his own cost. The contractor shall use his own equipment for such operation. It the tube well becomes useless due to any reason, it shall be treated as abandoned tube well and no payment shall be made for such abandoned tube well.

15. The contractor shall be fully responsible to fill up the abandoned bore hole with hard soil including compaction and watering so as to make top surface as good as original soil immediately and before shifting the drilling machine to prevent any accident. No payment would be made to the contractor on account of this.

16. If a tube well is found dry or with less yield and if it is not to be used for water supply due to any reason, the tube well shall be fitted with MS cap securely and a concrete block of 0.45m x 0.45m x0.45 m with M 15 cement concrete would be constructed on it to prevent any accident or damage to the tube well and also to use bore at any later stage for recharging or for any other purpose.

17. The Lowering and fixing of casing pipe in ordinary well and lowering of casing assembly in the gravel packed tube wells shall be done in the presence of authorised representative of the Engineer in Charge of work. The G.I. casing pipe to be lowered and fixed in intertrappean formation shall be jointed by welding only. In the case of gravel packed tube well it shall be ensured by the contractor that the slotted pipes or screened pipes shall be lowered in the tube well at the locations of water bearing aquifers as per design. The contractor shall also ensure that joints of the pipes in casing assembly are rigid and water tight and a bail plug is properly fixed in the bottom of casing assembly.

18. All the gravel to be used, as pack in gravel packed tube wells shall be as specified in IS 4097:1988 (Reaffirmed- 1993)

19. The development of gravel packed tube wells shall be done by compressor for minimum eight hours after completion of drilling of tube well and paid as per item. The development of all type of the tube wells shall be done as per IS specification (IS 11189-1985)

The following Indian standard shall be referred to :-

- **(i)** I.S. 2800 (Part-I) :1991(Reaffirmed 2001)- Code of practice for construction & testing of tube wells/Bore wells
- **(ii)** I.S. 2800 (Part-II) :1979(Reaffirmed 1999)- Code of practice for construction & testing of tube wells/Bore wells
- **(iii)** I.S. 4097-1988 (Reaffirmed 1999)- Specification for construction & testing of tube wells/Bore wells
- **(iv)** I.S. 11189-1985 (Reaffirmed 1999)- Method of tube well development
- **(v)** I.S. 1239 (Part -I)1990 Mild steel tubes, tubular & other wrought steel fittings- specifications.
- **(vi)** I.S. 12818:1992 Unplastisized PVC screen and casing pipes for bore/ tube well- specification
- **(vii)** I.S. 15500 (Part 1 to 8) Deep well hand pumps, components and special tools- specifications.

21.0 TUBE WELL & RAIN WATER HARVESTING

Code No	Description	Unit	Rate Rs.

Code No	Description	Unit	Rate Rs.
21.1	Boring/drilling bore well perfectly vertical for the specified depth suitable to receive required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer–in-charge upto 90 metre depth below ground level.		
21.1.1	All types of soil		
21.1.1.1	100 mm dia.	metre	297.00
21.1.1.2	125 mm dia.	metre	321.00
21.1.1.3	150 mm dia.	metre	339.00
21.1.1.4	200 mm dia	metre	371.00
21.1.2	Rocky strata including Boulders.		
21.1.2.1	100 mm dia.	metre	312.00
21.1.2.2	125 mm dia.	metre	349.00
21.1.2.3	150 mm dia.	metre	396.00
21.1.2.4	200 mm dia.	metre	457.00
21.2	Boring/drilling bore well perfectly vertical for the specified depth suitable to receive required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer–in-charge beyond 90 metre & upto 150 metre depth below ground level.		
21.2.1	All types of soil		
21.2.1.1	100 mm dia.	metre	330.00
21.2.1.2	125 mm dia.	metre	349.00
21.2.1.3	150 mm dia.	metre	371.00
21.2.1.4	200 mm dia	metre	396.00
21.2.2	Rocky strata including Boulders.		
21.2.2.1	100 mm dia.	metre	330.00
21.2.2.2	125 mm dia.	metre	371.00
21.2.2.3	150 mm dia.	metre	424.00
21.2.2.4	200 mm dia.	metre	475.00
21.3	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer –in-charge.		

Code No	Description	Unit	Rate Rs.
21.3.1	100 mm nominal size dia.	metre	454.00
21.3.2	125 mm nominal size dia.	metre	474.00
21.3.3	150 mm nominal size dia.	metre	540.00
21.3.4	200 mm nominal size dia.	metre	973.00
21.4	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) slotted pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.		
21.4.1	100 mm nominal size dia.	metre	459.00
21.4.2	125 mm nominal size dia.	metre	504.00
21.4.3	150 mm nominal size dia.	metre	546.00
21.4.4	200 mm nominal size dia.	metre	979.00
21.5	Supplying, assembling, lowering and fixing in vertical position in bore well, ISI marked G.I. casing pipe (Plain) medium class in 4 to 7 meters length one end fitted with socket as per IS: 1239 (Part-1&Part-2) 1992 with IVth revision (Up-to-date amendments), of reputed & approved make, including required hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer- in-charge.		
21.5.1	100 mm nominal dia	metre	957.00
21.5.2	125 mm nominal dia	metre	1131.00
21.5.3	150 mm nominal dia	metre	1304.00
21.6	Supplying, assembling, lowering and fixing in vertical position in bore well, slotted casing pipe made from ISI marked G.I. pipe (Plain) medium class in 4 to 7 meters length one end fitted with socket as per IS: 1239 (Part-1&Part-2) 1992 with IVth revision (having slot of size 1.6/3.2 mm), of reputed and approved make, including hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge.		
21.6.1	100 mm nominal dia	metre	969.00
21.6.2	125 mm nominal dia	metre	1142.00
21.6.3	150 mm nominal dia	metre	1317.00
21.7	Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 mild steel screwed and socketed/ plain ended casing pipes of required dia, conforming to IS: 4270, of reputed & approved make, including required hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge.		
21.7.1	100 mm nominal size dia having minimum wall thickness 5.0 mm	metre	900.00
21.7.2	125 mm nominal size dia having minimum wall thickness 5.0 mm	metre	1073.00
21.7.3	150 mm nominal size dia having minimum wall thickness 5.0 mm	metre	1237.00

Code No	Description	Unit	Rate Rs.
21.7.4	200 mm nominal size dia having minimum wall thickness 5.4 mm	metre	1477.00
21.8	Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 plain slotted (having slot of size 1.6/3.2 mm) mild steel threaded and socketed / plain bevel ended pipe (type A) of required dia, conforming to IS: 8110, of reputed and approved make, having wall thickness not less than 5.40 mm, including hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge.		
21.8.1	100 mm nominal size dia having minimum wall thickness 5.0 mm	metre	911.00
21.8.2	125 mm nominal size dia having minimum wall thickness 5.0 mm	metre	1084.00
21.8.3	150 mm nominal size dia having minimum wall thickness 5.0 mm	metre	1248.00
21.8.4	200 mm nominal size dia having minimum wall thickness 5.0 mm	metre	1489.00
21.9	Gravel packing in tube well construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.	cum	1048.00
21.10	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tube well, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	hour	654.00
21.11	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for bore well of:		
21.11.1	100 mm dia	each	182.00
21.11.2	125 mm dia	each	200.00
21.11.3	150 mm dia	each	217.00
21.11.4	200 mm dia	each	240.00
21.12	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tube well as per IS: 2800 (part I), including necessary bolts & nuts of required size complete.		
21.12.1	100 mm clamp.	each	1007.00
21.12.2	125 mm clamp.	each	1031.00
21.12.3	150 mm clamp.	each	1055.00
21.12.4	200 mm clamp.	each	1199.00

Code No	Description	Unit	Rate Rs.
21.13	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tube well as per IS:2800 (part I).		
21.13.1	100 mm dia	each	153.00
21.13.2	100 mm dia	each	165.00
21.13.3	150 mm dia	each	171.00
21.13.4	200 mm dia	each	200.00
21.14	Supplying, filling, spreading & leveling stone boulders/ Gravels/ Coarse sand, in recharge pit, in the required layers and thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge. (excavation of pit will be paid separately).		
21.14.1	Stone boulders of size range 5 cm to 20 cm, in recharge pit	cum	863.00
21.14.2	Gravels of size range 5 mm to 10 mm, over the existing layer of boulders	cum	806.00
21.14.3	Coarse sand of size range 1.5 mm to 2 mm over existing layer of gravel	cum	471.00
21.15	Providing and placing in position India Mark II hand pump with 32 mm diameter riser pipe assembly complete with all accessories (riser pipe and plunger rod to be paid separately).	each	6114.00
21.16	Providing ISI Mark 32 mm dia G.I. (B class) riser pipe and M.S. plunger rod in 3 meter length socketed on one end as per IS: 1239 (Part I) 1990 with up to date amendments and socket as per IS: 2062/1990 up to date amendments.	metre	275.00
21.17	Carrying out the resistivity survey by VES method using Schlumberger configuration for locating the proper spot for drilling of tube well within the selected habitation, including photography, interpretation of resistivity data and submission of report in the desired format along with resistivity readings, necessary graph and photographs. (only successful point is payable)	point	1502.00
21.18	Providing and fixing filter of minimum 100 litre capacity for roof top rain water harvesting through tube well consisting of two layered HDPE tank with five layers (each layers of minimum 100 mm) consist of coarse sand, 4mm, 6mm, 8mm & 12 mm gravels with stainless steel wire mesh fixed between each layer with suitable length and sufficient numbers of 110 mm dia PVC pipe pieces in the bottom of tank to support the above layer including fixing of inlet and out let P.V.C. pipe of required diameter upto 2 metre length on each side, Cement Concrete plateform of required size complete as directed by Engineer in charge. (excluding cost of tubewell and inlet and outlet pipe beyond 2 metre)	litre	18.50
21.19	Providing and fixing 80-100 mm dia PVC ball valve for inlet/ outlet of rain water harvesting pipe and filter.	each	644.00

22.0 HORTICULTURE & LAND SCAPING

A) GENERAL

Horticultural operations shall be started on ground previously leveled and dressed to require formation levels and slopes.

In case where unsuitable soil is met with, it shall be either removed or replaced or it shall be covered over to a thickness decided by the Engineer-in-Charge with good earth.

In the course of excavation or trenching during horticultural operations, any walls, foundations, etc., met with shall not be dismantled without pre-measurement and prior to the written permission of the Engineer-in-Charge.

B) MATERIAL

a) Grass

1) Cynodon Dactylon-Doob, Calcutta, Rajghat Bermuda

2) Improved/hybrid strains of Bermuda grass

3) Zoyasia grasses.

The grass shall be fresh, free from weed and rank vegetation with sufficient nodes and shall be approved by Engineer-in-Charge before planting.

b) Farm yard manure: It shall be well decayed free from grits and any other unwanted materials.

c) Good Earth: The soil shall be suitable for gardening free from kanker, Moorum, shingle, rocks, stones, brick-bats, building rubbish and any other foreign matter. The earth shall be free from clods or lumps of sizes bigger than 75 mm in any direction. It shall have P.H. Value ranging from 6 to 8.5.

d) Oil Cake (Neem/Castor) : The cake shall be free from husk, dust, grit and any other foreign matter.

e) Sludge: It shall be obtained from approved disposal works.

C) EXECUTION

a) Trenching: Trenching shall consist of the following operations :

1) The whole plot shall be divided into narrow rectangular strips of about 1.5 m. width or as directed by the Engineer-in-Charge.

2) These strips shall be sub-divided lengthwise into about 1 m. long sections. Such sections shall be excavated serially and excavated soil deposited in the adjacent section preceding it.

3) In excavation and depositing care shall be taken that the top soil with all previous plant growth including roots, get buried in the bottom layers of trenched area, the dead plants so buried incidentally being formed into humus.

4) The excavated soil shall be straight away dumped into the adjoining sections so that double handling otherwise involved in dumping the excavated stuff outside and in back filling in the trenches with leads is practically eliminated.

b) ROUGH DRESSING THE TRENCHED GROUND:

Rough dressing the area shall include making kiaries for flooding. The trenched ground shall be leveled and rough dressed and if there are any hollows and depressions resulting from subsidence which cannot be so leveled, these shall be filled properly with earth brought from outside to bring the depressed surface to the level of the adjoining land and to remove discontinuity of slope and then rough dressed again. The supply and spreading of soil in such depressions is payable separately. In rough dressing, the soil at the surface and for 75 mm depth below, shall be broken down to particle to size not more than 10 mm in any direction.

c) SPREADING GOOD EARTH

Good earth sludge shall be removed from stacks by head load and spread evenly over the surface to the thickness ordered by the Engineer-in-Charge. It shall be spread with a twisting motion to avoid segregation and to ensure that spreading is uniform over the entire area.

d) UPROOTING WEEDS FROM TRENCHED AREAS

After 10 days and within 15 says of flooding the rough dressed trenched ground with water, the weeds appearing on the ground, shall be rooted out carefully and the rubbish disposed off as directed by the Engineer-in-Charge.

e) FINE DRESSING THE GROUND

Slight unevenness, ups and downs and shallow depressions resulting from the settlement of the flooded ground, in drying and from the subsequent weeding operations, shall be removed by fine dressing the surface to the formation levels of the adjoining land as directed by the Engineer-in-Charge, and by adding suitable quantities of good earth, brought from outside, if necessary. Such supply and spreading of good earth stacked at site is however, payable separately. In fine dressing, the soil at the surface and for 40 mm depth below shall be broken down to particles of size not exceeding 6 mm in any direction.

f) MIXING OF GOOD EARTH AND SLUDGE / MANURE

The stacked earth shall, before mixing, be broken down to particles of sizes not exceeding 6 mm in any direction. Good earth shall be thoroughly mixed with sludge or manure in specified proportion as described in the item or as directed by the Engineer-in-Charge. The mixing shall be spread as described in 18.5.1 to the thickness ordered by the Engineer-in-Charge.

g) GRASSING WITH 'DOOB GRASS'

The area from where the grass roots are to be obtained shall be specified by the Engineer-in-Charge at the time of execution of the work and no royalty shall be charged on account from the contractor. The soil shall be suitably moistened and then the operation of planting grass shall be commenced. The grass shall be dibbled at 10 cm, 7.5 cm., 5cm., apart in any direction or other spacing as described in the item. Dead grass and weeds shall not be planted. The contractor stall be responsible for watering and maintenance of levels and the lawn for 30 days or till the grass forms a thick lawn free from weeds and fit for moving whichever is later. Generally planting in either direction at 15 cm.,10 cm, spacing is done in the case of large open spaces, at 7.5 cm. spacing in residential lawns and at 5 cm, spacing for Tennis Courts and sports ground lawns.

D) PRECAUTIONS :

During the maintenance period, any irregularities arising in ground levels due to watering or due to trampling by labour, or due to cattle straying thereon, shall be constantly made upto the proper levels with earth as available or brought from outside as necessary. Constant watch shall be maintained to ensure that dead patches are replanted and weeds are removed.

E) MEASUREMENT

Length, breadth and depth shall be measured correct to a cm., where unit of measurement is cum and the volume shall be calculated in cum correct to two places of decimal.

Length and breadth shall be measured correct to a cm., where unit of measurement is sqm and the area shall be calculated in sqm correct to two places of decimal.

Length shall be measured correct to a cm., where unit of measurement is meter.

The items shall be enumerated, where the unit of measurement each.

For the items of supply of material the stacks measurement shall be taken for length breadth and depth correct to a cm. The volume of stacks shall be reduced for voids, as given below, to arrived at the net quantity for payment:

FARMYARD MANURE	8%
GOOD EARTH	20%
SLUDGE	8%

F) RATES:

The rates of this chapter includes cost of all material, labour, hardware, T&P, wastages, scaffolding and hire & running charges of machinery etc. required to execute the work.

22.0 HORTICULTURE & LAND SCAPING

Code No	Description	Unit	Rate Rs.
22.1	Trenching in ordinary soil upto a depth of 60cm including removal and stacking of serviceable materials and then disposing of by spreading and neatly leveling 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	115.00
22.2	Supplying and stacking of good earth at site including royalty, loading, unloading and carriage upto 5 km (earth measured in stacks will be reduced by 20% for payment).	cum	201.00
22.3	Supplying and stacking sludge at site including royalty, loading, unloading and carriage upto 5 km (sludge measured in stacks will be reduced by 8% for payment).	cum	248.00
22.4	Supplying and stacking at site well decayed cow dung manure from approved source, including loading, unloading and carriage upto 5 km (manure measured in stacks will be reduced by 8% for payment).	cum	236.00

Code No	Description	Unit	Rate Rs.
22.5	Rough dressing the trenched ground including breaking clods.	sqm	0.50
22.6	Uprooting weeds from the trenched area after 10 to 15 days of its flooding with water including disposal of uprooted vegetation.	sqm	1.60
22.7	Fine dressing the ground	sqm	1.10
22.8	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	17.50
22.9	Mixing earth and sludge or manure in proportion specified or directed.	cum	11.00
22.10	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).		
22.10.1	In rows 15 cm apart in either direction.	sqm	2.70
22.10.2	In rows 7.5 cm apart in either direction.	sqm	3.80
22.10.3	In rows 5 cm apart in either direction.	sqm	6.60
22.11	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).	sqm	11.00
22.12	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.	sqm	18.50
22.13	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 upto 1.5 m complete (cost of sludge, manure or extra earth to be paid for separately).	cum	115.00
22.14	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) :		
22.14.1	Holes 1.2 m dia and 1.2 m deep.	each	274.00

Code No	Description	Unit	Rate Rs.
22.14.2	Holes 60 cm dia, and 60 cm deep.	each	33.00
22.15	Half brick circular tree guard in modular well burnt clay bricks of crushing strength not less than 25kg/ sqcm, internal diameter 1.25 metre and height 1.2 metre above ground and 0.20 m below ground bottom two courses laid dry and top three courses in cement mortar 1:6 (1 cement : 6 fine sand) and the intermediate courses being in dry honey comb masonry as per design complete:	each	1241.00
22.16	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 riveted 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	2362.00
22.17	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 :		
22.17.1	A coat of coal tar.	each	414.00
22.17.2	Two or more coats of synthetic enamel paint of approved quality shade over a priming coat.	each	509.00
22.18	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 :		
22.18.1	A coat of coal tar.	each	327.00
22.18.2	Two or more coats of synthetic enamel paint of approved quality and shade over a priming coat.	each	473.00
22.19	Edging with modular well burnt clay bricks of crushing strength not less than 25kg/ sqcm laid dry length wise including excavation, refilling, consolidating with hand packing and spreading neatly surplus earth within a lead of 50 m :	metre	28.50
22.20	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	5.50
22.21	Excavation in dumped stones or malba including stacking of serviceable and unserviceable material separately and disposal of unserviceable material lead upto 50 m and lift upto 1.5 m disposed material to be neatly dressed.	cum	154.00
22.22	Excavation in bajri path including stacking of serviceable and unserviceable material lead upto 50 m and lift upto 1.5 m disposed material to be neatly dressed.	cum	176.00

Code No	Description	Unit	Rate Rs.
22.23	Excavation in water bound macadam road including stacking the serviceable and unserviceable material separately and disposal of unserviceable material lead upto 50 m and lift upto 1.5 m disposed material to be neatly dressed.	cum	219.00
22.24	Flooding the ground with water including making kiaries and dismantling the same.	sqm	1.10
22.25	Providing and planting following herbs in garden including preparation of soil, base plantation, providing and spreading different fertilizers, soil and sand:		
22.25.1	Hedges like Alife, Dorenta, Tikoma etc	each	14.00
22.25.2	Furn like Arica, China etc (3 year old)	each	125.00
22.25.3	Hibiscus (Flower)/ Rose	each	26.50
22.25.4	Carpet grass (well developed)	sqm	263.00

23.0 FIRE FIGHTING

A) GENERAL

Fire fighting (wet riser and sprinkler) system includes all pipe work, pumping sets, yard hydrants, internal hydrants, fist aid hose etc. This chapter covers all work except pumps (being electrical work).

B) MATERIAL

a) MS Pipes: Only "C" class (Heavy) ISI marked pipe shall be used in fire fighting work.

b) Hydrants: All types of hydrants shall be ISI marked only.

c) Valves: All sluice valves and non return valves shall be ISI marked and PN 1.6.

e) Other Material: All other material used in fire fighting system shall be ISI marked only if available, otherwise best product available in the market and that should be approved from Engineer-in-charge before use at work.

C) EXECUTION

a) Piping: The length of pipes shall be jointed by welding only including all Tee's, bends. For joining valves and hydrants suitable size Steel flanges are to be welded or screwed and welded in the pipe line. Pressure testing shall be done for entire pipe line with all accessories.

b) Hydrants: The hydrants shall be connected in pipe line with nuts and bolts by providing good quality rubber insertion.

D) PRECAUTIONS :

The wet riser fire fighting system is kept under pressure all the times. So special care is to be taken while installation all fire fighting equipments and accessories to avoid any leakage or pressure loss.

E) MEASUREMENT

(i) Length, breadth and depth shall be measured correct to a cm., where unit of measurement is cum and the volume shall be calculated in cum correct to two places of decimal.

(ii) Length and breadth shall be measured correct to a cm., where unit of measurement is sqm and the area shall be calculated in sqm correct to two places of decimal.

(iii) Length shall be measured correct to a cm., where unit of measurement is meter.

(iv) The items shall be enumerated, where the unit of measurement each.

F) RATES:

The rates of this chapter includes cost of all material, labour, hardware, T&P, wastages, scaffolding and hire & running charges of machinery etc. required to execute the work.

Code No	Description	Unit	Rate Rs.

Code No	Description	Unit	Rate Rs.
23.1	Supply, erection, jointing, testing & commissioning of "C" Class MS pipes (as per IS: 1239) including necessary specials such as tees, bends, flanges reducers etc., complete on wall/ ceiling. The pipes to be erected on wall or suspended from beams, RCC roof slabs with suitable size MS bars/ angle irons including painting of metal part except pipe line.		
23.1.1	50mm dia.	metre	322.00
23.1.2	65mm dia.	metre	561.00
23.1.3	80mm dia.	metre	889.00
23.1.4	100mm dia.	metre	1263.00
23.1.5	150mm dia.	metre	1849.00
23.2	Painting for M.S. pipe with a coat of red oxide primer and two or more coats of synthetic enamel paint of approved colour and Quality to give an even shade including surface preparation.		
23.2.1	50mm dia.	metre	15.00
23.2.2	65mm dia.	metre	18.50
23.2.3	80mm dia.	metre	22.50
23.2.4	100mm dia.	metre	26.50
23.2.5	150mm dia.	metre	37.00
23.3	Providing and wrapping 4 mm thick of approved make and quality bitumen based anti rust felt over MS pipe with overlap of 25 mm to make an impermeable layer including painting with one coat of bitumastic paint before felt complete. (Only on MS pipe to be laid in soil below ground).		
23.3.1	80 mm dia	metre	89.00
23.3.2	100 mm dia	metre	107.00
23.3.3	150 mm dia	metre	151.00
23.4	Providing, installation, testing and commissioning of dual plate non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc. as required.		
23.4.1	80mm dia	each	4113.00
23.4.2	100mm dia	each	5203.00
23.4.3	150mm dia	each	8384.00
23.5	Supplying, fixing, testing and commissioning of flanged butterfly valve PN 1.6, with Bronze/Gunmetal seat duly ISI marked complete with Nuts, Bolts, washers, gaskets, conforming to IS: 13095 of following sizes as required.		
23.5.1	80mm dia	each	2809.00
23.5.2	100mm dia	each	3461.00
23.5.3	150mm dia	each	4856.00

Code No	Description	Unit	Rate Rs.
23.6	Providing and fixing C.I. double flanged sluice valves rated to PN 1.6 with C.I. Wheel bolts, nuts, washers 3mm thick insertion rubber gasket including matching flanges table E, complete.		
23.6.1	100mm dia	each	3453.00
23.6.2	150mm dia	each	5081.00
23.7	Providing and fixing brass GM/ ball valve (full bore type) with plastic coated lever and screwed female ends tested to 20 Kg/ cm2 of approved quality as specified.		
23.7.1	25 mm dia	each	436.00
23.7.2	50 mm dia	each	762.00
23.8	Providing, fixing, testing and commissioning 50mm dia drain system in wet riser line with 50mm dia GM valve, necessary MS "C" class pipe line (upto 1 metre) and accessories complete as required.	each	977.00
23.9	Providing and fixing gunmetal single acting air release valve with screwed inlet 25 mm dia and with necessary G.I. coupling, valve to be fitted on top of Air vessel or on wet riser as per specification.	each	1126.00
23.10	Providing and fixing Flow switches suitable for fixing in 50mm to 150mm dia pipe line, complete with all accessories to provide indication in annunciator panel.	each	3603.00
23.11	Providing and fixing pressure switch with suitable for 1-10 Kg/cm2 including 12/15 mm Ø isolation valve, G.I. nipple, elbow, electrical connections setting of Cut-In and cut-Off pressure complete in all respects and in an approved manner.	each	1253.00
23.12	Supplying and installing pressure gauge of 100 mm Ø., 0-300 PSI or 0-21 kg per cm square fitted with 12/15 mm Ø. pad cock valve, and G.I. pipe, elbow etc. as per requirement in approved manner.	each	750.00
23.13	Providing and fixing 15 mm dia, Quartzoid bulb type G.M. Sprinkler Head set to operate at 680C of approved make chrome plated complete in all respect as required.	each	1005.00
23.14	Supplying and fixing swinging type First-Aid Hose Reel drum with MS construction spray painted in Post office Red colour, conforming to IS: 884 with upto date amendments, complete with brackets for fixing on wall, connections from riser with 25 mm dia MS/GI pipe and GM gate valve but excluding hose reel.	each	4410.00
23.15	Supplying and fixing 19mm dia 22.5 metre long high pressure polypropylene First-Aid Hose Reel.	each	1462.00
23.16	Supplying and fixing 19mm dia 30 metre long high pressure polypropylene First-Aid Hose Reel.	each	1936.00
23.17	Supplying and fixing 19mm dia high pressure rubber First-Aid Hose Reel.	metre	123.00
23.18	Supplying and fixing single headed internal hydrant valve with instantaneous Gun metal couplings of 63 mm dia with cast iron wheel ISI marked conforming to IS: 5290 (Type - A) with blank Gunmetal cap and chain as required.	each	6719.00

Code No	Description	Unit	Rate Rs.
23.19	Supplying and fixing double headed internal hydrant valve with instantaneous Gun metal couplings of 63 mm dia with cast iron wheel ISI marked conforming to IS: 5290 (Type - A) with blank Gunmetal cap and chain as required.	each	11517.00
23.20	Supplying and erecting orifice plate having 6 mm thickness, 140 mm outer dia at every single outlet hydrant valve as per specification.	each	409.00
23.21	Supplying and erecting orifice plate having 6 mm thickness, 140 mm outer dia at every double outlet hydrant valve as per specification.	each	524.00
23.22	Supplying and fixing 63 mm dia, 15 mtr long RRL hose pipe with 63 mm dia Male and Female Stainless Steel-IS: 3444 Grade-1 couplings duly binded with GI wire, rivets etc. conforming to IS: 636 (Type -A) as required.	each	3527.00
23.23	Supplying and fixing 63 mm dia, 15 mtr long Flax canvas hose pipe with 63 mm dia Male and Female Stainless Steel-IS: 3444 Grade-1 couplings duly binded with GI wire, rivets etc. conforming to IS: 636 (Type -A) as required.	each	10188.00
23.24	Supplying & fixing 63 mm dia Stainless Steel IS: 3444 Grade-1 branch pipe with 20 mm dia (nominal internal) Gun Metal nozzle conforming to IS: 903, suitable for instantaneous coupling connection to connect hose pipe coupling as required.	each	2983.00
23.25	Supplying and fixing of MS hose cabinet box of made of 2 mm thick MS sheet and 40 x 40 x 5mm angle iron with front openable cover having 6 mm thick glazed glass viewing window i/c necessary locking arrangement, on existing wall/ brick platform etc complete as required.		
23.25.1	Size 1800 mm x 900 mm x 500 mm	each	20281.00
23.25.2	Size 900 mm x 600 mm x 500 mm	each	8962.00
23.25.3	Size 600 mm x 600 mm x 500 mm	each	5959.00
23.26	Providing and fixing fire brigade 63mm dia GM suction coupling to 100/150 mm dia suction pipe complete.	each	2908.00
23.27	Supply and fixing 150 mm dia CI foot valve in suction line from water tank complete.	each	15416.00
23.28	Supply and fixing 100 mm dia CI foot valve in suction line from water tank complete.	each	7203.00
23.29	Supply and fixing 150 mm dia CI steiner in suction line from water tank complete.	each	5536.00
23.30	Supply and fixing 100 mm dia CI steiner in suction line from water tank complete.	each	3343.00
23.31	Supplying and fixing 4 way Fire Brigade Connection of cast iron body with 4 Nos. Gun metal male instantaneous inlet couplings complete with cap and chain conforming to IS: 904 including connection to existing MS pipe line complete as required.	each	12434.00
23.32	Supplying and fixing 2 way Fire Brigade Connection of cast iron body with 2 Nos. Gun metal male instantaneous inlet couplings complete with cap	each	9207.00

Code No	Description	Unit	Rate Rs.
	and chain conforming to IS: 904 including connection to existing MS pipe line complete as required.		
23.33	Providing and fixing standard fireman's axe (tested for 20000 Volts) with heavy insulated rubber handle. (ISI marked)	each	2435.00
23.34	Providing and constructing masonry chamber 90x90 x100 cms inside with 3.5 class designation fly ash brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for water meter/ sluice valve/ etc, M.S. cover of size 600mm x 600mm with M.S. frame and 6mm thick sheet with locking arrangement etc complete.	each	7825.00
23.35	Providing and fixing M.S. structural work fabricated from standard sections, (MS rounds, angles, channels etc.) including cutting to size, drilling welding including cost of steel fasteners, clamp in RCC structural members as directed, including two coat of enamel painting over one coat of red oxide primer complete.	kg	66.00
23.36	Supplying and installing Air Vessel of 300 mm dia, 1.5m in height made of 5mm thick MS sheet including painting with one primer and two finish coats complete as per specification.	each	13136.00

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