PART-B

GENERAL CONDITIONS

1. Except for the items, for which Particular Specifications are given or where it is specifically mentioned otherwise in the description of the items, the work shall generally be carried out in accordance with the "CPWD Specifications - 2019 (Vol. I & II) for civil works with up-to-date correction slips and CPWD Specification for Horticulture works with up-to-date correction slips (hereinafter to be collectively referred to as "CPWD Specifications"). Wherever CPWD Specifications are silent, the latest BIS Codes/ Specifications, National Building Code 2026, MoRTH specification or any other specification shall be followed. All above specifications shall be applicable with corrections slips up to the last date of submission/ uploading of bid.

2. The order of preference in case of any discrepancy as indicated in condition No. 8.1 under "Conditions of Contract" given in standard CPWD Contract form may be read as the following:

(i) Description of items as per Schedule of Quantities

(ii) Particular Specifications and Special Conditions as provided forming part of tender

document.

(iii) CPWD Specifications with up-to-date Correction slips

(iv) Architectural/ Structural drawings

(v) Indian Standard Specifications of BIS

(vi) National Building Code - 2026

(vii) Manufacturers specifications.

(viii) Decision of Engineer-in-charge

"In the event of any variation/ discrepancy in the drawings, specifications and tender documents etc., the decision of the Engineer-in-charge shall be final & binding and conclusive on the contractor and in case, the contractor have any doubt and the same should be got clarified

immediately from the Engineer-in-charge and no claim of the contractor shall be entertained thereafter. Moreover, the agency is not allowed to take any benefit out of any clerical/ grammatical mistake in the standard clauses/Schedule of Quantities/ Specifications etc. being used in the agreement".

A reference made to any Indian Standard Specifications in these documents, shall imply to the latest version of that standard, including such revisions/ amendments as issued by the Bureau of Indian Standards up to last date of receipt of tenders. The Contractor shall keep at his own cost all such publications of relevant Indian Standard applicable to the work at site.

3. The following modifications to the above specifications shall however apply:

a) All stone aggregates shall be of hard stone variety to be obtained from approved quarries of Government of Maharashtra.

b) Sand to be used for cement concrete work, mortar for masonry and plaster work shall be of standard quality conforming to the CPWD Specifications. Sand shall be obtained from approved quarry of Government of Maharashtra/ manufactured sand of desired quality and screened or washed as required. Necessary royalty slips shall be deposited with department as soon as the material is received at site.

c) Bricks, wherever to be used, shall be of Fly Ash cement/ Fly ash lime & Gypsum of class designation 100 kg/sqcm or higher as specified in schedule of quantity, and AAC blocks of class designation 45 kg/sqcm as per relevant IS codes.

4. The proposed building work is a prestigious project and quality of work is of paramount importance. Contractor shall have to engage well experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like stone masonry & stone cladding work, stone flooring, flooring work, wood work, precast RCC coffers, poly sulphide / silicone sealant & other specialized works will specifically require engagement of skilled workers having experience particularly in execution of such items.

5. Samples including brand/ quality of materials and fittings to be used in the work shall be got approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work. Nothing Extra shall be paid on this account. Proper entry in sample approval register shall be made and uploaded in ERP.

6. The cost of work shall be inclusive of pumping out or bailing out underground or rain water, if required at site in any circumstances, for which no extra payment will be made. This will include water encountered from any source, such as rains, floods, and sub-soil water table being high or due to any other cause whatsoever.

7. The tenderer shall acquaint himself with the proposed site of work, its approach roads, working space available etc. before quoting his rates and no claim on this account shall be entertained by the department.

8. The contractor(s) shall get himself acquainted with nature and extent of the work and satisfy himself about the availability of materials from kiln or approved quarries for collection and conveyance of materials required for construction.

9. The tenderer shall see the approaches to the site. In case any approach from main road is required at site or existing approach is to be improved and maintained for cartage of materials by the contractor, the same shall be provided, improved and maintained by the contractor at his own cost. No payment shall be made on this account.

11. The building work shall be carried out in the manner complying in all respects with the requirements of the relevant bylaws and regulations of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-charge and nothing extra shall be paid on this account.

12. The contractor(s) shall inform/issue notices or make necessary correspondences with the Municipality, police and other authorities that may be required as per law and obtain all requisite permission/ licenses for temporary obstructions, enclosures etc. Contractor(s) shall pay all fee, taxes and charges which may be leviable on account of these operations in executing the contract. He shall make good any damage

to the property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night. Getting the Commencement/Occupancy certificate for local body is in the scope of the contractor and work shall be considered complete only after getting occupancy certificate from authorized statutory body.

13. For construction works which are likely to generate malba / rubbish, the contractor shall reuse it at site as directed by the Engineer-in-charge or hand over to recycling agents or dispose of at his own cost to the notified/specified Municipal dumping ground. No deduction on this account shall be made from the agency as well as no extra payment will be made to agency if it is disposed at pre-defined location within the campus / Municipal dumping ground.

14. The contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupiers of adjacent properties and to the public in general and to prevent any damage to such properties and any pollution of smoke, streams and water-ways. He shall make good at his cost and to the satisfaction of the Engineer-in-Charge, any damage to roads, paths, cross drainage works or public or private property whatsoever caused thereon by the contractor. All waste or superfluous materials shall be carried away by the contractor without any reservation entirely to the satisfaction of the Engineer-in-Charge.

15. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants/ users of building/adjacent properties.

16. The works shall be carried out in accordance with the Architectural drawings and structural drawings, to be issued from time to time by the Engineer-in-Charge. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available thereof is complete and unambiguous and matching with building bye-laws applicable at worksite. The discrepancy, if any shall be brought to the notice of the Engineer-in-Charge before execution of the work. The contractor alone shall be responsible for any loss or damage

executing by the commencement of work on the basis of any erroneous and or incomplete information.

17. The Architectural drawings given in the tender other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixings involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Engineer-in-Charge.

18. Other agencies will also simultaneously execute and install the works of activities like ancillary works to the building, sub-station/ generating sets, air-conditioning, lifts, etc. for the work and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings trenches etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be supplied free of cost by the department unless otherwise specifically mentioned) and the contractor shall fix the same at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

19. The contractor shall conduct work so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose of the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

20. Some restrictions may be imposed by the security agencies/client for the working hours and on movement of labour, materials etc in the habituated and operational campus/site and may require to take special measures and issue identity cards to all persons authorized by contractor to do work/visit the work site. The contractor shall be bound to follow all such restrictions/ instructions and no claim whatsoever shall on this account will be entertained. The loss of time on this account, if any, shall have to be made up by generating additional resources etc.

21. The rates quoted by the contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark, spot levels, construction of all safety and protection devices, barriers, earth embankments, preparatory works, all testing of materials, working during monsoon, working at all depths, height and locations etc. unless specified in the schedule of quantities.

22. Royalty at the prevailing rates wherever payable shall have to be paid by the contractor on the boulders, metal, shingle, sand and bajri etc. or any other material collected by him for the work direct to revenue authorities and nothing extra shall be paid by the department for the same.

23. Permission for the Excavation of the Basement and/or any Mining Approval along with carriage and disposal of surplus excavated earth shall be obtained by the contractor at his own expenses from Local Administration/ Revenue Authority. Department/ Client Department shall only forward the case to the concerned Authority. Moreover, all the fee including royalty for surplus excavated earth is to be paid by the contractor to the concerned department. Nothing extra shall be paid on account of this to the contractor.

24. No payment shall be made for any damage caused by rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the govt. property and work for which the payment has been advanced to him under the contract and he shall make good the same at his risk and cost. The contractor shall be fully responsible for safety and security of his material, T&P, Machinery brought to the site by him.

25. The contractor shall deploy resources e.g. manpower, labour, T&P, Plant & Equipment etc. as per actual requirement of work. No damages/compensation shall be payable on account of idle manpower, labour, T&P, Plant and Equipment and loss of profit etc. for whatsoever reason.

26. The rates for all items of work shall, unless clearly specified otherwise, include cost of all labour, material, tools and plants and other inputs involved in the execution of the item.

27. The contractor (s) shall quote all-inclusive rates against the items in the schedule of quantities and nothing extra shall be payable for any of the conditions and specifications mentioned. In the tender documents unless specifically specified otherwise.

28. The work shall be executed and measured as per metric dimensions given in the Schedule of quantities, drawings etc. (FPS units wherever indicated are for guidance only).

29. Unless otherwise specified in the schedule of quantities, the rates tendered by the contractor shall be inclusive of all costs & taxes and shall apply to all leads and lifts and nothing extra shall be payable on this account.

30. No foreign exchange shall be made available by the Department for importing (purchase) of equipment, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained from the Contractor, on account of variation in the foreign exchange rate.

31. All ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the ground level, temporary structure for plants and machineries, temporary barricading or fencing around the working sites, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, protection works, testing facilities/ laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. Before start of the work, the Contractor shall submit to the Engineer-in-Charge, a site/ construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement & other storage, fabrication yard, site laboratory, water tank etc.

32. The contractor shall provide an air-conditioned portable site office of minimum 100 sq m comprising one executive room, two engineers' room with workstations, one conference room, one general office space and one toilet for CPWD officials, complete with basic furniture and furnishings, as approved by the Engineer-in-Charge.

33. For completing the work in time, the Contractor might be required to deploy extra labour force due to limited working hours as the lectures/ seminars will be going on in campus and there is limited availability of space for labour/ material. Normally contractors shall not be allowed to execute the RCC, electrical and finishing work at night. Work at night shall, however, be allowed if the site conditions/ circumstances so demand. No claim whatsoever shall be entertained on this account, not with-standing the fact that the contractor may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the contractor with them.

34. The contractor shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.

35. All material shall only be brought at site as per program finalized with the Engineer-in-Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.

36. The contractor(s) shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed. The stacking shall take place as per stacking plan however, if any change is required, the same shall be done with the approval of Engineer-in-Charge.

37. The Contractor shall bear all incidental charges for cartage, storage and safe custody of materials issued by department/arranged by the contractor.

38. The terms machine batched, machine mixed and machine vibrated concrete used elsewhere in agreement shall mean the concrete produced in concrete batching and mixing plant and if necessary, transported by transit concrete mixers, placed in position by the concrete pumps, tower crane and vibrated by surface vibrator /needle vibrator / plate vibrator, as the case may be to achieve required strength and durability.

39. Any legal or financial implications resulting out of carriage of earth from outside or disposal of earth shall be sole responsibility of the contractor. Nothing extra shall be paid on this account.

40. The work should be planned in a systematic manner so that chase cuttings in the walls, ceilings and floors are minimized. Wherever absolutely essential, the chase shall be cut using chase cutting machines only. Chases will not be allowed to be cut using hammer/ chisel. The electrical boxes should be fixed in walls simultaneously while raising the brick work. The contractor shall ensure proper coordination of various disciplines viz. sanitary & water supply, electrical, fire-fighting and any other services.

41. The work of water supply, internal sanitary installations and drainage etc. shall be carried out as per the bylaws of the Municipal Corporation or any other local body, by the trained and certified plumbers and the contractor shall produce necessary completion certificates from such authority after completion of work.

42. In case of local Municipal regulations/ restrictions by client/ non-availability space at site if huts for labour are not allowed to be erected at the site of work, the contractor shall be required to provide such accommodation at suitable place at his own cost and nothing extra shall be paid on this account.

43. Any cement slurry added over base surface for continuation of concerting for better bond is deemed to have been built in the items and nothing extra shall be payable and no extra cement considered in consumption on this account.

44. Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar service encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. In case the same are to be removed and diverted. The same shall be payable to the contractor. The contractor shall work out the cost and the same shall be approved by Engineer-in-Charge. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

45. The contractor shall be responsible for the watch and ward/ guard of the building's safety, fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the Client department. No extra payment shall be admissible on this account.

46. SETTING OUT

- Contractor shall provide permanent bench marks and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural and plumbing drawings.
- The contractor shall establish, maintain and assume responsibility for grades, lines, levels and bench marks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions to the Engineer-in-Charge before commencing work. Commencement of work shall be regarded as the contractor's acceptance of such grades, lines, levels and dimensions and no claim shall be entertained at a later date for any errors found.
- If at any time, any error in this respect shall appear during the progress of the work, the contractor shall, at his own expense rectify such error if so required to the satisfaction of the Engineer-in-Charge.
- Though the site levels may be indicated in the drawings the contractor shall ascertain himself and confirm the site levels with respect to GTS bench mark from the concerned authorities.

- The approval by the Engineer-in-Charge of the setting out by the contractor shall not relieve the contractor of any of his responsibilities.
- The contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignment, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the contractor at his own cost to the instructions and satisfaction of the Engineer-in- Charge.

47. PROGRAMME CHART

- The Contractor shall prepare an integrated programme chart in MS Project/ Primavera software for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfilment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in-Charge within ten days of award of the contract. Non- submission of such programme shall attract the recoveries as mentioned in the Schedule-F of the tender document.
- The programme chart should include the following:

(a) Descriptive note explaining sequence of the various activities.

(b) Network (PERT/CPM/BAR CHART) in MS Project/Primavera Software

(c) Programme for procurement of materials by the contractor.

(d) Programme of procurement of machinery/ equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.

- In addition to above, the contractor shall submit shuttering schedule adequate to complete structure work within laid down physical milestone etc. and to achieve the progress of work as per programme, he must bring sufficient shuttering material required for cement concrete and R.C.C. works etc.
- If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above, the contractor shall produce a revised programme showing the modifications to the approved programme to ensure completion of the

work. The modified schedule of programme shall be approved by the Engineer-in-Charge. Non-submission of such revised programme shall attract the recoveries as mentioned in the Schedule-F of the tender document. For Periodic inspections of the local body and on completion of works, the Contractor shall procure approvals and local body completion certificates.

- The submission for approval by the Engineer-in-Charge of such programme or the furnishing of such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

48. PROGRESS REPORTS

The contractor shall submit to the Engineer-in-charge on the 4th day of each month, 2 hard copies and one soft copy (CD) of monthly progress report of the work. Such progress report will include the project progress, summary, work progress (planned vs actual), CPM chart, progress chart along with photos, status of financial progress and achievement of milestone, manpower deployment status, inventory of materials and photographs of important activities. For delay in submission of the report, compensation @ Rs.2000/- (Rupees Two Thousand only) per day of delay subject to maximum of Rs.20,000/- for each report will be recovered from the amount payable to the contractor.

49. SAFETY PRECAUTIONS

- Contractor shall within two weeks of award of work, submit to the Engineer-in-Charge for his approval, list of measures for maintaining safety of manpower deployed for construction.
- Contractor at his cost put up the barricading of height as per applicable Local Body Rules all around the construction site through suitable method for segregating the construction site and also to control the dust pollution in the campus. Entry to the site shall be controlled for proper security of man and materials and to avoid accidents.
- The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards, day and night speed limit boards,

red flags, red lights and providing barriers. He shall be responsible for all damages and accidents caused to existing/new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work.

- In case of any accident of labours / contractual staff"s the entire responsibility will rest on the part of the contractor and any compensation under such circumstances if becomes payable the same shall be entirely borne by the contractor and department shall have no role on this account.
- It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
- Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.
- For facia work, outer finishing and other RCC works etc. double steel scaffolding having two sets of vertical supports with steel staircase for execution & further inspection of works by engineer in charge shall be used. The supports shall be sound and strong, tied together with horizontal piece/diagonal braces over which scaffolding planks shall be fixed. However, nothing extra shall be payable on this account.

50. QUALITY ASSURANCE (Civil & Electrical)

- The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-Charge.

The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. He shall have to submit quality assurance programme within two weeks of the award of work. The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control. The contractor shall get the source of all other materials, not specified elsewhere in the document, approved from the Engineer-

in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer- in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once approved, he shall stick to it. The contractor shall submit purchase vouchers/ challan of all the material brought at site to ascertain the source and quality of material. A register for all the material being received by the contractor is to maintained.

- The contractor shall depute Quality Manager exclusively for enforcement of quality control. Such Quality Manager should be a qualified engineer with minimum Eight years of similar experience. For other staff to be deployed for quality assurance, the contractor may refer to clause 32 under schedule “F” of this document.

For Quality Control Measures, Preparation of Bills and Monitoring the Quality, the contractor shall provide the following, in the site office of Engineer-in-Charge which shall be used by the department’s officers and will become property of the department:

(i) 02 Nos. All-in-One Computers/Laptops having Intel core i7 11th generation or higher processor, Genuine MS-Windows-11& Office-365

(ii) 01 No. A-3 size colour laser printer with networking facility for printing of drawings at site

(iii) Projectors with screen/ TV of min 65-inch size shall be made available at site for presentation work in site office.

- Wherever work is specified to be done through specialized agencies, their names shall be got approved well in advance from Engineer in charge& as per applicable milestones/programme chart. Failure to do so shall not justify delay in execution of work. It is suggested that immediately after award of work, contractor should associate with concerned specialized agencies and send their names for approval to the Engineer in charge.

- All materials obtained from Govt. Stores or otherwise shall be got checked by the Engineer-in-Charge or his any authorized supervisory staff on receipt of the same at site before use. The contractor shall submit shop drawings of staging and shuttering arrangement, aluminium work, and other works as desired by Engineer in Charge for his approval before execution. The contractor shall also submit bar bending schedule for approval of Engineer-in-charge before execution.
- The contractor shall provide at his own cost suitable weighing and measuring arrangements at site for checking the weight/ dimensions as may be necessary for execution of work. The sealed samples are to be handed over to the testing lab by contractor in the presence of Junior Engineer/Assistant Engineer-in-Charge of work.
- All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.
- The contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of samples. In case, he or his authorized representative is not present or does not associate him, the results or such tests and consequences thereon shall be binding on the contractor.
- For certain items, if frequency of tests is not mentioned in the CPWD Specifications, then the relevant IS code shall be followed and tests shall be carried out as per the frequency specified therein or further as per written approval by the Engineer-in-charge.
- If any load testing or special testing is to be done for any sample whose strength is doubtful, the cost of the same shall also be borne by the contractor.
- In case there is any discrepancy in frequency of testing as given in list of mandatory tests and that in individual sub-heads of work as per CPWD Specifications, higher of the two frequencies of testing shall be followed.
- Samples of all materials and fittings to be used in the work in respect of brand manufacturer and quality shall be got approved from the

Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-in-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per approved list of brand names given in the tender document / additional specifications for approval of Engineer-in-charge. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer- in-Charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval.

- To avoid delay, contractor should submit samples as stated above well in advance so as to give timely orders for procurement. If any material, even though approved by Engineer-in-Charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost.
- The contractor shall get the source of all other materials, not specified elsewhere in the document, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once approved, he shall stick to it. The contractor shall also submit copy of GST paid vouchers of all material brought at site to the Engineer in charge as soon as the material is brought at site, through ERP/ by email.
- The contractor shall get the water tested with regard to its suitability and conforming to the relevant IS Code. The contractor shall obtain written approval from the Engineer- in-Charge before he proceeds by using the same for execution of work. The water testing charges shall be borne by the contractor. If tube well water is not suitable, the contractor

shall arrange Municipal water or from any other alternate source at his own cost and nothing extra shall be paid on this account. The water shall be got tested at frequency specified in latest CPWD Specifications/ BIS Code. In case of change of source of water, the contractor shall obtain written approval from the Engineer-in-Charge before he proceeds by using the same for execution of work. All testing & consequent charges shall be borne by the Contractor.

- The Stone aggregate/stone, sand shall be brought from any approved quarries of Government of Maharashtra subjected to the said materials conforming to CPWD specifications. In case of non-supply of materials from the approved quarries, the contractor shall immediately write to the Engineer-in-charge along with substantial document/proof as such for approval of other quarries. The contractor shall be fully responsible for conducting revised Design mix, other specified test etc. & nothing extra shall be paid on this account.
- The gradation of fine sand to be used in plaster work shall be strictly as per CPWD Specifications 2019, conforming to IS:1542-1977. The plastered surface shall be fairly smooth without any undulation of any kind for applying paint/white wash.
- The contractor shall submit shop drawings of staging and shuttering arrangement, aluminium/ u-PVC work and other works as desired by Engineer-in-charge for his approval before execution. The contractor shall also submit RCC bar bending schedule for approval of Engineer-in-charge before execution.
- The contractor shall submit detailed layout drawings corresponding to the approved flooring patterns in all areas/toilet/staircase before execution of work for approval by the Engineer-in-charge.
- The contractor shall invariably prepare the samples of finishing items i.e. flooring of different types, external & internal finishing i/c colour scheme of paint, tiles in dado, flooring in platforms & staircase, water supply & sanitary fittings and any other item as per direction of Engineer-in-charge. The contractor shall proceed with further finishing items only after getting the samples of these items approved in writing from Engineer- in-charge. Toilets and in case of construction of residential

quarters, one sample quarter complete in all shape for each category, shall be prepared by the contractor and got approved from Engineer-in-charge in writing. The contractor shall be allowed to proceed with further quarters only after getting the sample quarters approved in writing from Engineer-in-charge No extra claim whatsoever beyond the payments due at agreement rates will be entertained from the contractor on this account.

- The construction joints shall the provided in pre-determined locations only as decided by Engineer in charge. The cost of shuttering for these construction joints shall be included in item of Concrete work/ RCC work and nothing extra shall be payable on this account to the contractor.
- Water tanks, taps, sanitary, water supply and drainages pipes, fittings and accessories should conform to the specifications provided in bidding documents. The contractor(s) should engage approved, licensed plumbers for the work and get the materials (fixtures/fittings) tested, by the municipal Body/Corporation authorities, wherever required, at his own cost. The Contractor(s) shall submit for the approval to the Engineer-in-Charge the name of the plumbing agency proposed to be engaged by him.
- All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions submitted before covering.
- The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.
- Door/window frames/shutters and other factory-made materials shall be procured from reputed and approved manufacturers or their authorized dealers as per approved make list forming part of this tender document. Decision of Engineer-in-charge in this regard shall be final and binding.

- The contractor shall render all help and assistance in documenting the total sequence of this project by way of photography, slides, audio-video recording etc. nothing extra shall be payable to the contractor on this account.
- Testing of Materials:

51. Laboratory at site: The contractor shall establish a testing lab at site and provide testing equipment and materials for the field tests mentioned in the list of mandatory tests given in CPWD Specifications 2019 Vol. 1 & 2. Nothing extra shall be payable to him on this account. The representatives of the department shall be at liberty to inspect the testing facilities at site and conduct testing at random in consultation with Engineer in charge. The contractor shall provide all necessary facilities for the purpose.

The laboratory shall be equipped, inter alia, with the following equipment:

- **Balances:**

i. 7 kg to 10 kg capacity, semi self-indicating type – Accuracy 10 gm.

ii. 500 gm capacity, semi self-indicating type Accuracy 1 gm.

iii. Pan Balance-5kgCapacity-Accuracy10gm.

- **Ovens**- Electrically operated, thermostatically controlled up to 1100 C- Sensitivity 10C.
- **Sieves**: as per IS: 460

i. IS Sieves – 450 mm internal dia of sizes 100 mm, 80 mm, 63 mm, 50 mm, 40 mm, 25mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75 mm, complete with lid and pan.

ii. IS Sieves – 200 mm internal dia (brass frame) consisting of 2.36 mm, 1.18 mm, 500 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.

iii. Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.

- Equipment for slump test- Slump cone, steel plate, taping rod, steel scale, scoop.
- Equipment for concrete testing

- Concrete cube moulds 15x15x15cm : 42 Nos.
- Pruning Rods 2Kg weight length 40cm and ramming face 25mm : 1 No.
- Extra Bottom plates for 15cm cube mould : 6 No.
- Standard Vibration table for cubes : 1 No.
- Dial gauges 25 mm travel- 0.01 mm/division Least count- : 1 No.
- Automatic Compression testing machine of 100 tonne capacity. : 1 No.
- Ultrasonic Pulse Velocity Test Equipment (For concrete) : 1 No.
- Any other testing equipment as desired by Engineer-in-charge

Not less than 90% tests for material be performed at site lab with above stated equipment's, however at least 10% testing of materials shall be got done from external laboratories. However, for the tests to be carried out by the external laboratories, the contractor shall supply free of charge all the materials required for testing, including transportation and fee for such testing is also required to be borne by the contractor. If the tests which were to be conducted in the site laboratory are conducted in other laboratories for any the reasons the cost of such tests shall be borne by the contractor.

52. Other Laboratories: The contractor shall arrange carrying out all tests required under the agreement through the laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including charges for testing for all materials.

- Maintenance of Site Registers:

(i) All the Site Registers including Tests registers for tests to be carried out at construction site or in outside laboratories shall be maintained by the contractor which shall be issued to the contractor by Engineer-in-Charge in the same manner as being issued to CPWD field staff.

(ii)The various registers to be issued to the contractor are:

- Materials at site account register.

- Cement register.
- Master test registers.
- Cube test register.
- Paint register.
- Drawing register.

(iii) All the entries in the registers will be made by the designated engineering staff of the contractor and same should be regularly reviewed by JE/AE/EE/ SE.

(iv) All the registers of tests carried out at construction site or in outside laboratories shall be maintained by the contractor which shall be issued to the contractor by Engineer-in- Charge in the same manner as being issued to CPWD field staff.

(v) All samples of materials including cement concrete cubes shall be taken jointly with contractor by JE and out of this at least 50% samples shall be taken in presence of AE in charge. If there is no JE, all samples of materials including cement concrete cubes shall be taken by AE jointly with contractor. All the necessary assistance shall be provided by the contractor. Cost of sampling & testing are to be borne by the contractor and he shall be responsible for safe custody of samples to be tested at site/ outside laboratory.

(vi) All the tests in field lab at construction site shall be carried out by the Engineering staff deployed by the contractor and shall be 100% witnessed by JE/ AE–in-Charge. At least 10% (25% for concrete) of all samples for testing taken in presence of Engineer-in-Charge. Minimum 10% of all samples or as decided by Engineer-in-Charge should be tested in outside approved laboratory/ Govt. Engineering colleges.

(vii) Submission of copy of all test registers, material at site register along with each alternate running account bill and final bill shall be mandatory. These registers should be duly checked by AE(P) in division office.

53. Third Party Quality Assurance:

In order to achieve a high standard of quality, it shall be required to go for Third Party Quality Assurance. For this purpose, a separate agency shall

be appointed by the CPWD who will carry out independent testing of materials and checking and ensuring overall quality procedures. The contractor shall be required to fully cooperate with agency and facilitate them in taking samples, transportation and examination of various activities including documentation at no extra time and cost to the owner. In case of any adverse findings by the agency, the contractor shall do the needful rectifications at no extra time and cost to the owner. The Engineer-in-charge shall be at liberty for getting quality assurance work done through agencies like IIT, NIT or any other agency approved by competent authority at its own cost. The successful tenderer shall include the provisions of Quality Assurance while framing the proposed methodology for tests.

54. AS BUILT DRAWINGS:

The contractor shall submit completion plan (5 sets) as required vide General Specifications for Civil works forming part of this tender document as applicable within thirty days of the completion of the work. In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum of 0.1 % of tendered Value or Rs.10,00,000/- whichever is more.

On completion of work, the Contractor(s) shall submit at his own cost four prints of “as built” drawings(5 Sets) to the Engineer-in-Charge within 30 days of completion of work. These drawings shall have the following information.

(i) Run off all piping and their diameters including soil waste pipes and vertical stacks.

(ii) Ground and invert levels of all drainage pipes together with locations of all manholes and connections, up to outfall.

(iii) Run off all water supply line with diameters, locations of control valves, access panels etc.

(iv) Further details, if any, as desired by the Engineer-in-charge.

Final bill will not be paid and Security Deposit shall not be released until submission of as built drawings as above.

55. SECRECY:

55.1. The contractor shall take all steps necessary that all persons employed on any work in connection with the contract have noticed that the Indian Official Secrets Act 1923 applies to them & will continue so to apply even after the execution of such works under the contract.

55.2. The contract is confidential and must be strictly confined to the contractor's own use (except so far as confidential disclosure to sub-contractors or suppliers as necessary) and to the purpose of the contract.

56. INSURANCE:

Before commencing the execution of work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, at site of work. The Contractor shall obtain and submit to the Engineer-in-Charge proper Contractor All Risk Insurance Policy for an amount 1.25 times the contract amount for this work with Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the Contractor (who shall be second beneficiary). Also, he shall indemnify the Department from any liability during the execution of the work. Further, he shall obtain and submit to the Engineer-in- Charge, a third-party insurance policy for maximum Rs.10 lakh for each accident, with the Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the Contractor (who shall be second beneficiary). The Contractor shall, from time to time, provide documentary evidence as regards payment of premium for all the Insurance Policies for keeping them valid till the completion of the work. The Contractor shall ensure that Insurance Policies are also taken for the workers of his Sub-Contractors/ specialized agencies also. The contractor including subcontractors shall provide comprehensive group insurance cover for all the workers and their supervisory staff deployed at site. The details of insurance cover to be provided shall be submitted by the contractor / associate agencies within 20 days of date of start. In case of a default, appropriate policy shall be got done by the safety monitoring committee and double the fee of the policy shall be recovered

from the next bill of the contractor. Without prejudice to any of its obligations and responsibilities specified above, the Contractor shall within 15 days from the date of letter of acceptance of the tender and thereafter at the end of each quarter submit a report to the Department giving details of the Insurance Policies along with Certificate of these insurance policies being valid, along with documentary evidences as required by the Engineer-in-Charge. No work shall be commenced by the Contractor unless he obtains the Insurance Policies as mentioned above. Also, no payment shall be made to the Contractor on expiry of insurance policies unless renewed by the Contractor. Nothing extra shall be payable on this account. No claim of hindrance (or any other claim) shall be entertained from the contractor on these accounts.

57. Submission of copy of all test registers, Materials at site register along with each alternate Running Account Bill and Final Bill shall be mandatory. These registers should be duly checked by competent authority in Division office and receipts of register should also be acknowledged by Account Officer by signing the copies and register to confirm receipt in Division office. If all the test registers and hindrance register is not submitted along with each alternate R/A bill & Final Bill, it will be responsibility of EE & AAO that no payment is released to the contractor.

58. Frequency of Testing: All mandatory tests shall be carried out as per frequency and procedure prescribed in CPWD specification/particular specifications given in this tender document and as and when directed by the Engineer-in-Charge.

59. Secured Advances

59.1. Secured Advances on the security of Bonafide materials brought at site shall be made in accordance with the provision of clause 10 B (i) of the GCC 2023 for construction works.

59.2. However, Bonafide materials on which secured advance have been given shall be incorporated/incorporation started on the work within 3

months of payment of secured advance. Such secured advance shall be recovered in full from the next payment made to the contractor.

60. SUBMISSION OF AS BUILT DRAWINGS AND OBTAINING various NOCs

The Contractor shall submit required sets of “AS BUILT” drawings for submitting the same to the Municipal Corporation/ Local bodies etc. for obtaining various service connections, revised commencement certificate if required, completion certificate, occupancy certificate. The Contractor shall submit to the Department, 05 sets of “AS BUILT” drawings and also in soft copy (CD – 2 sets) in PDF & CAD & BIM format of the standard software packages. Nothing extra shall be payable on this account. The contractor shall coordinate and facilitate for obtaining certificate from local bodies including getting the required site visits conducted by such authorities with a view to obtain the same. The contractor shall also be responsible for Liaoning work required, if any, in this regard with the local bodies. Nothing extra shall be payable on this account. Statutory charges, fees etc. required to be paid to the local bodies in this connection shall be payable by the Department or shall be reimbursable to the contractor, if required to be paid by the contractor, on production of proof of actual payment by him. It is clarified that the contractor shall be responsible for obtaining all required NOC required for NOC when project is completed for lift clearance, Fire clearance etc. for the various works (covered under the scope of this tender) required for obtaining completion certificate (building use permission). However, only two months, after the date of provisional completion, shall be allowed for obtaining various NOCs and completion certificate (building use permission) and final completion certificate shall be recorded only after obtaining necessary occupancy certificate by the contractor.

61. FACILITIES FOR THE DEPARTMENT

61.1. The contractor shall make arrangement for Helmets (make: MSA) and safety shoes (meant of construction work at sites) for all field staff of the department during the entire period of construction for safety reasons. One helmet and two pairs of shoes per staff member (maximum

six members) of the departments per year shall be arranged by the contractor.

61.2 The Contractor shall give the Engineer-in-charge on the 4th day of each month, a progress report along with pictorial photographs (softcopies as well as hard copies) of the work done during the previous month. The progress of work will be reviewed periodically by the Engineer-in charge with the contractor and short falls, if any, sorted out. The contractor shall there upon take such action as may be necessary to bring back his work to schedule without additional cost to the department. The contractor need to install one desktop (i9 latest processor, 1 TB SSD, 32 GB RAM and other required accessories) with 27" latest display with licenced software like MS Office, MS Project, STAAD Connect latest edition and E-Tabs latest edition and to be installed in the conference hall of CPWD office. The Project shall be reviewed every week using MS Project critical path method with resource planning, submitted by the contractor.

Note : Nothing extra shall be paid on the account of these special conditions. The RA bill payment shall be made only after making these facilities available for department by the contractor.

PARTICULAR CONDITIONS

1. GENERAL CONDITIONS FOR CEMENT

(i) The contractor shall procure Ordinary Portland/ Pozzolana/ Portland Pozzolana Cement conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers of cement as per Preferred Make List (Civil) as approved by Engineer in charge.

a. The supply of cement shall be made in 50 kg. bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of the relevant BIS codes. In case the test results indicate that the cement arranged by the contractor does not confirm to the relevant BIS code the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so.

b. If Portland Pozzolana cement or Portland slag cement is used, suitable modification in de-shuttering time etc. shall be done, if need be, as per specifications and standards and as directed by Engineer – in – charge and nothing extra shall be payable on this account. No extra payment/ deduction shall be made from the payment to the contractor for using any of the above type of cement.

c. The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the Engineer-in-Charge. The cement godowns of the capacity to store a minimum of **2000bags** of cement shall be constructed by the contractor at site of work for which no extra payment shall be made. The bulkers of OPC shall be allowed if required for RMC/ BMC to be used at site.For each grade/ type, cement bags shall be stored in two separate godowns, one for tested cement and the other for fresh cement (under testing) constructed by the contractor at site of work as per sketch shown in General conditions of contract for CPWD works with weather proof roofs and walls, for which no extra payment shall be made. The size of the cement godown is indicated in

the sketch for guidance only. The actual size of godown shall be as per site requirements and as per the direction of the Engineer in charge and nothing extra shall be paid for the same. Each godown shall be provided with a single door with two locks. Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the Engineer-in-charge or his authorized representative and the key of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the cement godown. The account of daily receipt and issue of cement shall be maintained in a register in the prescribed Proforma and signed daily by the contractor or his authorized agent in token of its correctness. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge at any time.

(ii) The cement shall be got tested by the Engineer-in-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to test laboratories. **The cost of all tests shall be borne by the contractor.**

(iii) The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 38of the contract and shall be governed by conditions laid therein. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate show prescribed shall be made. In case of excess consumption no adjustment needs to made.

(iv) The cement brought to site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in-Charge.

(v) The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-Charge. If he does not do show within three days of receipt of such notice, the Engineer-in-Charge shall get it removed at the cost of the contractor.

(vi) The contractor may use OPC in place of PPC only and only after

written permission of Engineer-in-Charge. In such case, no extra payment shall be made in any form to the contractor by the Department.

(vii) PPC or (OPC with fly-ash blending) shall be used in RCC structures in accordance with circular issued by the Directorate General of works vide No. CDO/SE (RR)/Fly Ash (Main)/102 dt.09.04.2009. The use of PPC shall be regulated as per the following conditions stipulated in the circular dt.09.04.2009.IS: 456- 2000 code of practice for plain and reinforced concrete shall be followed in regard to concrete Mix proportion and its production as under: -

a. The concrete mix design shall be done as" Design Mix concrete" as prescribed in clause. 9 of IS 456 mentioned above. The mix design shall be got approved by Engineer in Charge before starting the RCC work. Engineer in charge shall get the mix design verified from 3rd party (govt college or any approved laboratory), it shall be the responsibility of bidder to arrange the material for the same & bear the charges for designing mix testing.

b. Concrete shall be manufactured in accordance with clause 10 of above-mentioned IS.456 covering quality assurance measures both technical and organizational which shall also necessarily require a qualified concrete Technologist to be available during manufacture of concrete for certification of quality of concrete. Minimum M 40 except pile work and M-30 (Pile work) grade or as specified in Schedule of quantity of concrete shall be used in all structural elements of RCC both in load bearing and framed structure.

c. The mechanical properties such as modulus of elasticity tensile strength, creep and shrinkage of concrete using fly ash blended cements (PPCs) are not likely to be significantly different and their values are to be taken same as those used for concrete made with OPC.

d. To control higher rate of carbonation in early ages of concrete in PPC based concrete water/ binder ratio shall be kept as low as possible which shall be closely monitored during concrete manufacture. If necessitated due to low water binder ratio required workability shall be achieved by use of chloride free chemical admixtures conforming to IS.9103.

The compatibility of chemical admixtures & super plasticizers with each set PPC received from different sources shall be ensured by trials.

e. In environment subjected to aggressive chloride attack (or sulphate attack in particular) PPC based concrete is recommended. In case where structural concrete is exposed to excessive magnesium sulphate, fly ash content shall be limited to 18% by weight. Special type of cement with low C3A content may also be alternatively used. Durability criteria like minimum binder content and maximum water/ binder ratio also need to be given due consideration in such environment.

f. Wet curing period shall be enhanced to minimum of 20 days or its equivalent. In hot and arid regions, the minimum curing period shall be 14 days or its equivalent.

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

(viii) While using PPC for structural concrete work, no further admixing of fly ash shall be permitted. Till the time, BIS makes it mandatory to print the %age of fly-ash on each bag of cement, the certificate from the PPC manufacturer indicating the same shall be required before allowing use of such cements in works.

2. GENERAL CONDITIONS FOR STEEL REINFORCEMENT BARS:

a. The Contractor shall procure CRS bars of various grades confirming to IS:1786-2008 (As per latest Amendment and modifications) as specified in Schedule of quantity in cut and bent, as per approved BBS, directly from the Manufacturer/ Authorised supplier/Dealer of steel manufacturer as **SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd and JSW Steel Ltd** or their authorized dealers having valid BIS license for

b. The contractor shall have to obtain and furnish test certificates to the Engineer-in- charge in respect of all supplies of steel brought by him to the site of work.

c. Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor

does not conform to the specifications, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time or written orders from the Engineer-in-Charge to do so.

d. The steel reinforcement bars shall be brought to the site in bulk supply of **10 tonnes** or more as decided by the Engineer-in-charge.

e. The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

f. For checking nominal mass, tensile strength, bend test, re-bend test etc. specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:

Size of bar	**For consignment below 100 tonnes**	**For consignment above100 tonnes**
Under 10mm dia. bars	One sample for each 25 tonnes or part thereof	One sample for each 40 tonnes or part thereof
10 mm to16 mm dia bars	One sample for each 35 tonnes or part thereof	One sample for each 45 tonnes or part thereof
Over 16mm dia bars	One sample for each 45 tonnes or part thereof	One sample for each 50 tonnes or part thereof

g. The contractor shall supply free of charge the steel required for testing including transportation to testing laboratories. The cost of tests shall be borne by the contractor.

h. The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the GCC of the contract. The theoretical consumption of steel shall be worked out as procedure prescribed in clause 38 of the GCC of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption, no adjustment need to be made.

i. Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

j. The contractor shall submit original vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be used in the work. All consignment received at the work site shall be inspected by the Site staff along with the relevant documents before acceptance. The contractor shall obtain Original Vouchers and Test Certificates and furnish the same to the Engineer-in-Charge in respect of all the lots of steel brought by him from approved supplier to the site of work. The original vouchers and test certificates shall be defaced by the Site staff and kept on record in the site office.

k. Steel bars brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.

l. In case the contractor brings surplus quantity of steel the same after completion of the work will be removed from the site by the contractor at his own cost after approval of the Engineer-in-Charge.

m. Reinforcement including authorized spacer bars and overlaps shall be measured in length of different diameters, as actually (not more than as specified in the drawing) used in the work, nearest to a centimeter. Wastage and unauthorized overlaps shall not be measured.

n. The standard sectional weights referred to as in Table 5.4 under para 5.3.4 in CPWD Specifications for works 2019 Vol. 1 will be considered for conversion of length of various sizes of MS bars, Tor steel bars and TMT bars into standard weight.

o. Records of actual sectional weight shall also be kept dia-wise & lot-wise. The average sectional

weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of

bars based on the actual weighted average sectional weight shall be termed as derived actual weight.

p. If the derived weight as in sub-para above is lesser than the standard weight as in sub-para above, the derived actual weight shall be taken for payment provided, if it is within the tolerances specified as in IS 1786-2008 elaborated further in the subsequent para, otherwise whole lot will be rejected. If the derived actual weight is found more than the standard weight then the standard weight as worked out in sub- para above shall be taken for payment. In such case nothing extra shall be paid for the difference between the derived actual weight and the standard weight.

q. Mixing of different type of steel/different grades of steel shall not be allowed in the same structural members as main reinforcement to satisfy clause 26.1 of IS:456.

3 CONDITIONS FOR GREEN BUILDING PRACTICE:

3.1. SITE

i. The contractor shall ensure that adequate measures are taken for the prevention of erosion of the top soil during the construction phase. The contractor shall implement the Erosion and Sedimentation Control Plan (ESCP) provided to him by the consultant engaged by him and approved by Engineer in Charge, after necessary modifications, as part of the larger Construction Management Plan (CMP). The contractor shall prepare working plan for the following month's activities as a CAD drawing showing the construction management, staging & ESCP. At no time soil should be allowed to erode away from the site and sediments should be trapped where necessary.

ii. The contractor shall ensure that all the top soil excavated during construction works is neatly stacked and is not mixed with other excavated earth. The contractors shall take the clearance of the Engineer in Charge before any excavation. Top soil should be stripped to a depth of 20 cm from the areas to be disturbed, for example proposed area for buildings, roads, paved areas, external services and area required for construction activities etc. It shall be stockpiled to a

maximum height of 40 cm in designated areas, covered or stabilized with temporary seeding for erosion prevention and shall be reapplied to site during plantation, landscaping etc. of the proposed vegetation. Top soil shall be separated from subsoil, debris and stones larger than 50 mm diameter. The stored top soil may be used as finished grade for planting areas.

iii. The contractor shall carry out the recommendations of the soil test report for improving the soil under the guidance of the landscape consultant who would also advise on the timing of application of fertilizers and warn about excessive nutrient levels.

iv. The contactor shall carry out post-construction placement of topsoil or other suitable plant material over disturbed lands to provide suitable soil medium for vegetative growth. Prior to spreading the top soil, the sub-grade shall be loosened to a depth of 50mm to permit bonding. Topsoil shall be spread uniformly at a minimum compacted depth of 50mm on grade 1:3 or steeper slopes, a minimum depth of 100mm on shallower slopes. A depth of 300mm is preferred on relatively flatter land.

v. The Contractor should follow the construction plan as proposed by the Architect/ Engineer in Charge to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site. Protect top soil from erosion by collection storage and reapplication of top soil, constructing sediment basin, contour trenching, mulching etc.

vi. No excavated earth shall be removed from the campus unless suggested otherwise by Engineer in Charge. All subsoil shall be reused in backfilling/landscape, etc as per the instructions of the Engineer in Charge. The surplus excavated earth shall be disposed of by the contractor at his own cost for reuse after approval from E-in-C. A certificate of reuse as required by the Engineer-in-Charge shall be submitted by the contractor.

vii. The contractor shall not change the natural gradient of the ground unless specifically instructed by the Engineer in Charge. This shall cover all-natural features like water bodies, drainage gullies, slopes, mounds, depressions, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by

the Engineer-in-charge.

viii. The contractor shall not carry out any work which results in the blockage of natural drainage.

ix. The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-charge

x. Contractor shall reduce pollution and land development impacts from automobiles use during construction.

xi. Overloading of trucks is unlawful and creates the erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering must take place. No overloading shall be permitted.

xii. The dismantle material/building rubbish received from dismantling/demolishing shall be dumped to the dumping ground in properly covered truck with precaution. Agency shall submit the hard copy of photograph showing the properly covered truck disposing the dismantles material/building rubbish. Failure of which shall be sternly dealt and a penalty @Rs.1000/- per trip of truck shall be levied and the decision of Engineer-in-Charge in this regard shall be final & binding.

xiii. Provision of wheel washing area in the construction site shall be mandatory for which nothing shall be paid extra to the bidder.

xiv. Agency/contractor shall not dump the construction material on the metaled road and shall keep the construction material on the physically demarcated space by the Engineer-in-Charge.

xv. All the building material responsible for pollution shall be brought at site from sources covered by tarpaulin and shall take all precautionary measure to ensure that no dust particles are permitted to pollute the air quality, failure of which Agency shall be liable to pay damages as decided by Engineer-in-Charge. The decision of Engineer-in-Charge shall be final & binding.

There shall be no burning of leaves, plastic etc. at construction site.

3.2. CONSTRUCTION PHASE AND WORKER FACILITIES

The contractor shall specify and limit construction activity in

preplanned/ designated areas and shall start construction work after securing the approval for the same from the Engineer in Charge. This shall include areas of construction, storage of materials, and material and personnel movement.

3.3. PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION

3.3.1. The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.

3.3.2. The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.

3.3.3. The contractor shall conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity. Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer-in-Charge. All the existing trees should be preserved, if not possible than compensate the loss by re-planting trees in the proportion of 1:3.

3.3.4. The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.

3.3.5. The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy. The preserved vegetated area shall be

inspected by the Landscape Architect/ Architect/ Engineer-in-charge at regular intervals so that they remain undisturbed. The date of inspection, type of maintenance or restorative action followed shall be recorded in the logbook

3.3.6. Contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. A project-vide policy of “Nothing leaves the Site” should be followed. In such a case when strictly followed, care would automatically be taken in ordering and timing of materials such that excess doesn’t become “waste”. The Contractor’s ingenuity is especially called towards meeting this prerequisite/ credit (IGBC Green new buildings v-3). Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable material, and track recycling efforts through out the construction process. Identify construction haulers and recyclers to handle the designated materials. The diversion may include donation of materials to charitable organizations and salvage of materials on-site.

3.3.7. Contractor shall collect all construction waste generated on site. Segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc. The contractor shall maintain record of all construction waste sent for recycling by means of site challans/receipts with waste quantity mentioned in weight or volume.

3.3.8. The contractor shall provide potable water for all workers. The contractor shall maintain monthly test reports highlighting that water is fit for drinking.

3.3.9. The contractor shall provide the minimum level of sanitation and safety facilities for the workers at their camp/labour site. The contractor shall ensure cleanliness of workplace with regard to the disposal of

waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

3.3.10. The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site . Contractor shall ensure the following activities to prevent air pollution during construction:

a) Clear vegetation only from areas where work will start right away

b) Vegetate/mulch are as where vehicles do not ply.

c) Apply gravel / landscaping rock to the areas where mulching / paving is impractical

d) Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base. Add surface gravel to reduce source of dust emission. Limit of fine particles (smaller than 0.075mm) - 10 to 20%.

e) Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged. Water spraying shall be done on:

(i) Any dusty materials before transferring, loading and unloading

(ii) Area where demolition work is being carried out

(iii) Any un-paved main haul road

(iv) Areas where excavation or earth moving activities are to be carried out

f) The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.

g) All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust/particulate emissions.

h) Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained/ leaned up immediately before they can infiltrate into the soil/ ground or runoff in nearby areas

i) Provide dust screens, sheeting or netting to scaffold along the perimeter of the building

j) Cover stock piles of dusty material with impervious sheeting

3.3.11. Cover the dust-laden materials transported in vehicles with impervious sheeting before the vehicles leave the site.

3.3.12. Contractor shall be required to provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminum can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program

3.3.13. The contractor shall ensure that no construction leachate (e.g. cement slurry etc.), is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including, reduction of wasteful curing processes, collection, basic filtering and reuse. The

contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).

3.3.14. Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.

3.3.15. The contractor shall comply with the safety procedures, norms and guidelines (as applicable) as outlined in the document Part 7 Constructional practices and safety, 2005, National Building code of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals displayed. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

3.3.16. The contractor shall ensure the following activities for construction workers safety, among other measures as specified in NBC-2026:

3.3.16.1. Guarding all parts of dangerous machinery.

3.3.16.2. Precautionary signs for working on machinery

3.3.16.3. Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.

3.3.16.4. Durable and reusable form work systems to replace timber formwork and ensure that formwork where used is properly maintained.

3.3.16.5. Ensuringthatwalkingsurfacesorboardsatheightareofsoundconstruction and are provided with safety rails or belts.

3.3.16.6. Provide protective equipment ; helmets etc.

3.3.16.7. Provide measures to prevent fires. Fire extinguishers and

buckets of sand to be provided in the fire-prone area and elsewhere.

3.3.16.8. Provide sufficient and suitable light for working during nighttime.

3.3.17. The storage of material shall be as per standard good practices as specified in Part 7, Section 2 - Storage, stacking and Handling practices, NBC-2026 and shall be to the satisfaction of the Engineer in Charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor's materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment with proper access and proper maneuver ability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipment at different stages of construction shall be considered.

3.3.18. The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English with suitable symbols.

3.3.19. The contractor shall prepare and submit spill prevention and control plans. before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

3.3.20. Contractor shall collect & submit the relevant material certificates for materials with high recycled (both post-industrial and post-consumer) content, including materials like RMC mix with fly-ash, glass with recycled content, calcium silicate boards etc.

3.3.21. Contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation,

Agri fiber, linoleum, wheat board, strawboard and cork etc.

3.3.22. Contractor shall adopt an IAQ (Indoor Air Quality) management plan to protect the HVAC system during construction, control pollutant sources, and interrupt path ways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wall board. He shall also protect stored on-site or installed absorptive materials from moisture damage.

3.3.23. The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

3.3.24. Contractor shall make efforts to reduce the quantity of indoor air contaminants that are odorous or potentially irritating harmful to the comfort and well-being of installer and building occupants. Contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers used must not exceed the VOC content limits mentioned below:

3.3.25. Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information, and submittals in accordance with GHAR or GRIHA program standards and guidelines. Towards meeting the aforementioned building environmental rating standard(s) expert assistance shall be provided to him up on request.

3.4. WATER USE DURING CONSTRUCTION

3.4.1. Contractor should spray curing water on concrete structure and shall not allow free flow of water. Concrete structures should be kept covered with thick cloth/gunny bags and water should be sprayed on them. Contractor shall do water ponding on all sunken slabs using cement and sand mortar.

3.4.2. The Contractor shall remove from site all rubbish and debris generated by the Works and keep Works clean and tidy throughout the Contract Period. All the serviceable and non-serviceable (malba) material shall be segregated and stored separately. The malba obtained

during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided.

3.4.3. The contractor shall provide O&M Manuals wherever applicable.

3.4.4. The contractor shall make himself conversant with the Site Waste Management Program Manual and actively contribute to its compilation by estimating the nature and volume of waste generated by the process/installation in question forming part of the contract.

3.5. MATERIALS & FIXTURES FOR THE PROJECT

3.5.1. The contractor shall endeavor to source most of the materials for construction at this project within a distance of 400 km radius from the project site. Contractor shall collect the relevant material certificates to prove the same.

3.5.2. Any material to be sourced from outside the prescribed radius shall be procured only after obtaining prior approval from the Engineer-in-Charge.

3.5.3. Unless otherwise specified, the contractor shall comply following:

3.5.3.1. All cement used at site for reinforced concrete, precast members, mortar, plaster, building blocks, etc shall be PPC (Portland Pozzolana Cement). The PPC must meet the requirements of IS 1489: 1991.Replacement of cement with fly ash in PPC (Portland Pozzolana Cement) used in the overall RC for meeting the equivalent strength requirements shall be carried out.

3.5.3.2. The contractor has to comply as per MoEF issued notification 8.0.763(E) dated 14th Sept.1999 containing directive for greater fly ash utilization, where it stipulates that every construction agency engaged in the construction of buildings within a radius of 50 km radius of a Thermal Power Plant, have to use of 100% flyash based bricks/blocks in their

construction. Any brick/block containing more than 25% fly ash is designated as fly ash brick/block. As per IGBC credits, bricks / blocks should contain a percentage of fly ash.

3.5.3.3. The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer-in-charge before the application of any such material.

3.5.3.4. All plumbing and sanitary fixtures installed shall be as per the direction of the Engineer-in-charge and shall adhere to the minimum LPM (liters per minute) and LPF (liters per flush) mentioned.

3.5.3.5. The contractor shall employ 100% zero ODP (ozone depletion potential)insulation; HCFC (hydro-chlorofluorocarbon)/ and CFC (chlorofluorocarbon) free HVAC and refrigeration equipment and/halon-free fire suppression and fire extinguishing systems.

3.6. RESOURCES CONSUMED DURING CONSTRUCTION

3.6.1. The contractor shall ensure that the water and electricity is not wasted during construction. The Engineer in Charge can bring to the attention any such wastage and the contractor will have to ensure that such bad practices are corrected.

3.6.2. The contractor shall install necessary meters and measuring devices to record the consumption of water, electricity and diesel on a monthly basis for the entire tenure of the project.

3.6.3. The contractor shall ensure that all run-off water from the site, during construction is collected and reused to the maximum.

3.6.4. The contractor shall use treated recycled water of appropriate quality standards for construction, if available.

3.6.5. No lights shall be turned on during the period between 6:00 AM to 6:00 PM, without the permission of the Engineer-in-charge.

3.6.6. The contractor is encouraged to use bio-diesel in place of petroleum diesel for the running of generators during construction

3.7. CONSTRUCTION WASTE

3.7.1. Contractor shall ensure that wastage of construction material is within 3%.

3.7.2. All construction debris generated during construction shall

be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type. Employ measures to segregate the waste on site into inert, chemical, or hazardous wastes.

3.7.3. All construction debris shall be used for road preparation, back filling, etc, as per the instructions of the Engineer in Charge, with necessary activities of sorting, crushing, etc.

3.7.4. No construction debris shall be taken away from the site, without the prior approval of the Engineer in Charge.

3.7.5. The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos.

3.7.6. If and when construction debris is taken out of the site, after prior permissions from the Engineer in Charge, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

3.7.7. Inert waste to be disposed of at Municipal Corporation/ local bodies landfill sites.

3.8 Barricading Work

3.8.1 Mandatory Barricading for Commencement of work

The Contractor shall ensure that site barricading is executed as a prerequisite for obtaining the Dismantling approval/Commencement Certificate (CC). Same is the within scope of the agreement hence nothing extra shall be paid. No major construction activity shall be initiated without completion of required barricading.

3.8.2 Mobilization and Priority of Work

Immediately after award of work and issue of Notice to Proceed, the Contractor shall mobilize resources and commence barricading work as the first activity at site.

3.8.3 Compliance with Guidelines

The barricading shall be designed and executed strictly in accordance with the prevailing guidelines and regulations of the BMC (Brihanmumbai Municipal Corporation) /MAHADA/ Local bodied , including provisions for:

Noise control

Dust suppression

Public safety

3.8.4.Approval of Drawings

The Contractor shall prepare detailed barricading drawings, including structural design and layout plans, and obtain approval from the Engineer-in-Charge.

3.8.5. Protection of Existing Trees and Surroundings

The barricading layout shall be planned in such a manner that no existing tree or vegetation is damaged. Any damage to trees, utilities, or surroundings shall be the sole responsibility of the Contractor. The Contractor shall bear all penalties, restoration costs, and legal liabilities arising out of such damage.

3.8.6.Time Schedule for Barricading

The Contractor shall complete barricading works within the following timelines:

Front/Road-side boundary: Within 1 month from the Date of Start

Boundary portion on of the adjacent residential blocks

Remaining boundary portion: Within 2 months from the Date of Start .

3.8.7 Safety and Maintenance

The Contractor shall ensure that barricading remains stable, safe, and properly maintained throughout the construction period.

Any damage, displacement, or deterioration shall be rectified immediately at no extra cost.

SPECIAL CONDITION

1.0 EARTH WORK

1.1 The work shall be done in accordance with CPWD Specifications - 2019 - Vol.I & Vol. II and National Building Code 2026 with upto date correction slips.

1.2 Excavation shall be undertaken to the width of the Basement/ Retaining wall footing including necessary margins for construction operation as per drawing or directed otherwise. Where the nature of soil or the depth of the trench and season of the year, do not permit vertical sides, the contractor at his own expense shall put up the necessary shoring, strutting and planking or cut slopes with or without steps, to a safer angle or both with due regard to the safety of personnel and works and to the satisfaction of the Engineer, Measurement of plan area of excavation for payment shall be permitted only. Nothing extra shall be paid for making steps and slopes etc. as required.

1.3 The contractor shall make at his own cost all necessary arrangements for maintaining water level, in the area where works are under execution low enough so as not to cause any harm to the works or problems in carrying out with the execution and the rates for all items of work shall be considered as inclusive of pumping out or bailing out water, if required, for which no extra payment shall be made. This will include water coming from any source, such as rains, accumulated rain water, floods, leakages from sewer and water mains, subsoil water table being high or due to any other cause whatsoever. The contractor shall make necessary provision of pumping, dredging, and bailing out water coming from all above sources and excavation and other works shall be kept free of water by providing suitable system approved by the Engineer-in-charge.

1.4 For the proposed pile foundation, sub-soil water management shall be aimed at ensuring stability of pile bores during drilling and providing dry and workable conditions for execution of pile caps and other shallow foundation works. The Contractor shall be fully responsible for maintaining bore stability against collapse and hydrostatic pressure by adopting

suitable and approved methods such as temporary casing, bentonite/polymer slurry or any other appropriate technique as per the approved construction methodology. Lowering of groundwater table during excavation for pile caps, grade beams, PCC, waterproofing works and allied foundation activities, the groundwater level shall be effectively controlled and maintained at least 50 cm below the PCC or working level and shall not be permitted to rise above foundation level until completion of waterproofing and backfilling up to ground level. The Contractor shall inspect the site and make his own independent assessment of sub-soil water conditions likely to be encountered during execution and shall include in his quoted rates the cost of all dewatering arrangements, pumping, standby equipment, power, fuel, manpower, drilling stabilizers, slurries, casings and all incidental works. No extra payment whatsoever shall be made on account of seasonal variations, fluctuations in water table or soil conditions. The dewatering methodology and sequence of construction shall be submitted to and approved by the Engineer-in-Charge prior to commencement of foundation works.

1.5 All the major excavation shall be carried out by mechanical excavator. No extra payment shall be made for that.

1.6 Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.

1.7 The rates are inclusive for all depths & nothing extra shall be paid for additional lift etc else otherwise specified in agreement.

2. CONCRETE WORK

2.1 The work shall be done in accordance with CPWD Specifications - 2019 - Vol.I & Vol. II with upto date correction slips.

2.2 If the quantity of cement actually used in the work is found to be more than the theoretical quantity of cement including authorized variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered that after the completion of the work, the quantity of cement used is less than the quantity ascertained as herein before provided (allowing variation on the

minus side as stipulated in clause 42) the cost of quantity of cement so less used shall be recovered from the contractor at the rate as specified in schedule “F". Decision of the Engineer-in-Charge in regard to the quantity of cement which should have been actually used as per the schedule and recovery at the rate specified shall be final and binding on the contractor.

2.3 For non-scheduled items, the decision of the Chief/Superintending Engineer or his successor regarding theoretical quantity of the cement, which should have been actually used shall be final and binding on the contractor. RCC work shall be done as per approved Design Mix Concrete report approved by the Engineer-in-charge.

3.0 RCC/CC WORK(DESIGN MIX CONCRETE)

3.1 RCC work shall be done with **Ready Mix Concrete** and also Pumpable Design Mix Concrete. Wherever letter “M" has been indicated, the same shall imply for the Design Mix Concrete. The Design Mix Concrete will be designated based on the principles given in BIS codes IS:456, IS:10262 & SP:23. The condition and specifications stated herein shall have precedence overall conditions and specifications stated in relevant BIS codes/CPWD specifications. The concrete mix shall be designed for specified target mean compressive strength in order to ensure that the work test results do not fall below the acceptance criteria specified for the concrete mix. The Contractor shall design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified. The mix shall be designed with quantities of admixture / plasticizer proposed to achieve required workability & strength. The specifications mentioned here in below shall be followed for Design Mix Concrete.

3.2 The sources of coarse aggregate, fine aggregate & water to be used in concrete work shall be identified by the contractor & he will satisfy himself regarding their conforming to the relevant specification & their availability before getting the same approved by the Engineer-in-Charge.

3.3 Coarse Aggregate: As per CPWD Specifications - 2019 - Vol.I & Vol.

II with up to date correction slips.

3.4 Fine Aggregate: As per CPWD Specifications - 2019 - Vol.I & Vol. II with upto date correction slips.

3.5 Water: It shall confirm to requirements laid down in IS:456-2000 / CPWD Specifications

- 2019 - Vol.I & Vol. II with upto date correction slips.

3.6 Cement: OPC 43 grade/ PPC 43+ grade shall be used for design mix concrete and shall conform to IS-1489 (part-I). However, if higher grade of cement is used by the contractor nothing extra shall be paid on this account.

3.7 Admixtures/ Plasticizers: - The admixture shall confirm to IS:9103, wherein required, the admixture of approved quality and approved make only shall be used to attain the required workability. Nothing extra shall be paid for use of admixtures.

3.8 Grade of Concrete: The compressive strength of various grades of concrete shall be given as below:

Grade Designation	Compressive Strength on 15cm Cubes at 7 Days (N/mm2)	Specified Characteristic Compressive Strength at 28Days (N/ mm2)	Maximum Water Cement Ratio	Minimum Cement to be used in kg per cum
M-25	As Per Design	25	0.5	330
M-30	As Per Design	30	0.45	350
M-35	As Per Design	35	0.45	370
M-40	As Per Design	40	0.4	390

The water-cement ratio and slump shall be maintained in accordance with the provisions of IS 456:2000, as applicable to the relevant grade of concrete and requirements of the work.

NOTE:

(i) In the designation of a Concrete mix letter M refers to the mix and the number of the specified characteristic compressive strength of 15 cm cube at 28 days expressed in N/mm2.

(ii) It is specifically highlighted that in addition to the above requirements, the **maximum cement content (bare cement) for any grade shall be**

limited to 400 kg /cum.

(iii) The maximum cement content for design mix concrete shall be maintained as per the quantity mentioned above. In case where the quantity of cement required as per Design Mix is lower than the quantity specified in the respective item in the "schedule of quantity", necessary deduction for less quantity of cement used shall be made from the contractor.

3.9 The contractor shall engage one of the IIT/NIT/Reputed Govt. Engineering Institutions/Approved Laboratories as directed by the Engineer-in-charge at his own expenses for designing the concrete mix in accordance with relevant IS Codes and to conduct laboratory test to ensure the target strength and workability criteria for a given grade of concrete.

3.10 The contractor shall submit the report on design mix from any of above approved laboratories for approval of Engineer-in-Charge within 30 days from the date of issue of letter of acceptance of the tender as envisaged under Clause-5 of Schedule-F of this bid document. No concreting shall be done until the design mix is approved. In case of white Portland cement and the likely use of admixtures in concrete with ordinary Portland/white Portland cement, the contractor shall design and test the concrete mix by using trial mixes with white cement and/ or admixtures also, for which nothing extra shall be payable.

3.11 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of the Engineer-in-Charge.

3.12 Trial Batches:

3.12.1 The designed mix proportion shall be checked for target mean compressive strength by means of trial batches.

3.12.2 The quantities of materials for each trial mix shall be sufficient for at least six specimens (cubes) and the concrete required for carrying out workability tests.

3.12.3 The workability of trial mix No. 1 shall be measured and mix shall be

carefully observed for freedom from segregation, bleeding and its finishing characteristics. The water content, if required, shall be adjusted corresponding to the required changes in the workability.

3.12.4 With the modified water content, the mix pro-portions shall be recalculated by keeping with water cement ratio unchanged. The mix proportions, as modified, shall form the Trial Mix No. 2 and tested for the specified strength and workability.

3.12.5 In addition, trial mix No. 3 and 4 shall be designed by keeping water contents same as that determined for trial mix 2 but varying the water cement ratio + 10 percent of the specified value and tested for their design characteristics.

3.13 All cost of mix designing and testing connected there with including charges payable to the laboratory shall be borne by the Contractor including redesigning of the concrete mix wherever required and directed by Engineer-in-Charge.

3.14 APPROVAL OF DESIGN MIX:

The mix design for a specified grade of concrete shall be done for a target mean compressive strength

Tck=Fck+1.65s

Where,

Fck=Characteristic compressive strength at 28 days.

s=Standard deviation which depends on degree of quality control.

The degree of quality control for this work is “good” for which the standard deviation (s) obtained for different grades of concrete shall be as follows:

GRADEOF CONCRETE	STANDARDDEVIATION(S)
M-25	4.0
M-30	5.0
M-35	5.0
M-40	5.0

Minimum three sets of separate preliminary test shall be carried out for each trial batch of concrete mix. Each test shall comprise six specimens and only one test set of six specimens shall be made on any particular day. Out of the six specimens of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days. While the design mix shall be approved only on the basis of test strength of 28 days. The design mix shall be considered satisfactory and approval if at least three preliminary tests- sets individually satisfy the following strength and workability criteria:

(a) The average strength of each test sets is not less than the specified target mean compressive strength (Tck).

(b) The strength of any specimen cube is notlessthan0.85 Tck.

(c) The concrete mix is required degree of workability and acceptance concrete finish.

3.15 All cost of mix designing and testing connected there with including charges payable to the laboratory shall be borne by the Contractor.

3.16 **WORK STRENGTH TEST**:

TEST SPECIMEN:

Work strength test shall be conducted in accordance with IS:516 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days.

TEST RESULTS OF SAMPLES:

The test results of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than + 15% percent of the average. If variation is more, the test results shall be treated as invalid. 90% of the total tests shall be done at

the laboratory established at site by the contractor and remaining 10% in the laboratory of IIT/NIT or in any other laboratory as directed by the Engineer-in-Charge.

LOT SIZE:

The minimum frequency of sampling of concrete of each grade shall be in accordance with CPWD specification 2019 and following:

QUANTITY OF CONCRETE IN THE WORK (CUBIC METRE PER DAY).	NUMBEROFSAMPLES
01-May	1
Jun-15	2
16-30	3
31-50	4
51&above	4 Plus one additional sample for each additional 50cubic meter so far part thereof

NOTE:- At least one sample shall be taken from each shift.

3.17 STANDARD OF ACCEPTANCE:

Standard of acceptance of hardened concrete of batch concrete shall be same as specified in CPWD Specifications / IS:456.)

(i) In case the test results of all the samples are above the characteristic compressive strength, the concrete shall be accepted.

(ii) In case the test result of one or more samples fails to meet the requirement (i) above, it shall be accepted if both the following conditions are met:-

a) Any individual test result is not less than (f_{ck}- S)N/mm2.

b) The mean of test results from any group of four consecutive samples is more than (f_{ck} + S) N/mm2.

Note: -S-Standard Deviation

iii) Concrete of each grade shall be assessed separately.

iv) Concrete is liable to be rejected, if it is porous or honeycombed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met.

3.18 The contractor has to arrange at site sufficient cantering and

shuttering for before two months from stipulated date of start of RCC casting. Only MS centering/ shuttering and scaffolding material unless & otherwise specified shall be used for all R.C.C. work to give an even finish of concrete surface. However, marine-ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor as approved by the Engineer-in-Charge.

3.19 Nothing extra shall be paid for the centering and shuttering, circular in shape whenever the form work is having a mean radius exceeding 6m in plan, except for the items mentioned in the SOQ.

3.20 In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specifications, the level of top surface of RCC shall be accordingly adjusted at the time of its centering, shuttering and casting for which nothing extra shall be paid to the Contractor.

As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept 25 mm as required lower than general floors shuttering should be adjusted accordingly and slabs should be laid with slope towards the drainage point. Nothing extra is payable on this account.

3.21 Ready mix concrete

- **General:**
- All nominal concrete used at site shall be machine mixed at site.
- Design mix concrete from fully automatic computerized concrete batching and mixing plant.
- **All Design mix concrete shall be procured from only RMC plant as per approved make list.**

All the operations & criteria for Ready mix (RMC) self compacting concrete shall be as per CPWD specifications with upto date correction slips.

The Engineer-in-Charge will reserve the right to inspect at any stage and reject the concrete if he is not satisfied about quality of product at the user's end.

The Engineer-in-charge reserves the right to exercise control over the ingredients, water and admixtures purchased, stored and to be used in the

concrete including conducting of tests for checking quality of materials, recording of test results and declaring the materials fit or unfit for use in production of mix.

For exercising such control, the Engineer-in-charge shall depute his authorized representative at the RMC plant. It shall be responsibility of the agency to ensure that all necessary equipment, manpower& facilities are made available to Engineer-in-Charge and/or his authorized representative at RMC plant.

Concrete as per approved design mix by Engineer-in-Charge shall only be produced and transported to the site.

The concrete mix design will be carried out by the agency, at his own cost, through one of the following laboratories/Test houses to be approved by Engineer-in-charge:

i. **National Test House, Mumbai.**
ii. **IITs, NITs or any Govt. Engineering College.**
iii. **VJTI Mumbai.**

In the event above laboratories are unable to carry out the requisite design/testing, the agency shall have to get the same done from any other reputed laboratory with prior approval of the Engineer-in-Charge.

- **Proportioning Concrete:**

In proportioning cement concrete, the quantity of both cement and aggregates shall be determined by weight. The cement shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipment shall be maintained in a clean and serviceable condition. The amount of mixing water shall be adjusted to compensate for moisture content in both coarse and fine aggregates. The moisture content of aggregates shall be determined in accordance with IS: 2386 (Part III). Suitable adjustments shall also be made in the weights of aggregates to allow for the variation in weight of aggregates due to variation in moisture content.

- **<u>Production of Concrete:</u>**

The concrete shall be produced in a central batching and mixing plant with, computerized printing for contents and admixture dosage. The batching plant shall be fully automatic. Automatic batcher shall be charged by devices

which, when actuated by a Single starter switch will automatically start the weighing operation of each material and stop automatically, when the designated weight of each material has been reached. The batching plant shall have automatic arrangement for dispensing the admixture and shall also be capable of discharging water in more than one stage. A print out from the batching plant for every lot shall be submitted. A batching plant essentially shall consist of the following components:

- Separate storage bins for different sizes of aggregates, silo for cement; and water storage tank.
- Batching equipment
- Mixers
- Control panels
- Mechanical material feeding and elevating arrangements
- Dust collector
- The compartments of storage bins for aggregates shall be approximately of equal size. The cement compartment shall be centrally located in the batching plant. It shall be watertight and provided with necessary air vent, aeration fittings for proper flow of cement & emergency cement cut off gate. The aggregate and sand shall be charged by power operated centrally revolving chute. The entire plant from mixer floor upward shall be enclosed and insulated. The batch bins shall be constructed so as to by self- cleansing during draw down. The batch bins shall in general conform to the requirements of IS: 4925.
- **WATER:** a) Water to be used in manufacturing and curing of Concrete shall be tested before use. All such tests shall be submitted to the Engineer in charge for his approval before water is used in work.
- Contractor shall identify the location of source of water intended to be used. Each such source of water shall be separately tested. In the event of a change in source of water all tests specified herein shall have to be repeated.
- In the event of water is drawn from tube wells or open wells, water samples shall be for seasonal fluctuations in water table or at intervals to be directed by the Engineer-in-charge.

Water samples from each source shall be tested as under:

Test	Number of tests for each source
Acidity	3
Alkalinity	3
Presence of Solids	3

- Mean values of the above tests shall be taken as the representative value and the acceptance criteria shall be based on these test results. All testing procedure and computation of test results shall conform to IS: 3025.
- Approved quality water shall be collected and stored in the Under Ground sumps/elevated tanks for the day-to-day requirement of work and same shall be used for all cement works and also for curing. Due care shall be taken in this regard.
- If Government source of supply is nearby and made available to the contractor; the contractor may use that water and accordingly, charges of metered water consumption at the rate decided by the Engineer-in-Charge will be deducted from the bills payable to him. However, testing procedure & frequency & storage modalities will remain same. Whatever may be the source of water, adequate capacity for storage shall be made. If required, RO PLANTS of sufficient capacity shall be established at his own cost.

Cement:- 43 grade ordinary Portland cement conforming to IS 8112 or Portland Pozzolona Cement confirming to IS 1489 (Part I) shall be used.

In case 43 grade Ordinary Portland Cement is not available, the contractor will be allowed to use 53 grade Ordinary Portland Cement (confirming to IS: 12269), subject to documentary evidence produced by the contactor regarding non availability of the specified grade. Nothing extra shall be paid for this.

Use of fly ash conforming to IS 3812 (Part –I) is permitted in cement

concrete work as partial substitution of OPC subject to fulfillment of conditions as per IS 1489 (Part-I) and satisfying the condition of minimum cement content.

- The batching equipment shall be capable of determining and controlling the prescribed amounts of various constituent materials for concrete accurately i.e., Water, cement, sand, individual size of coarse aggregates etc. The accuracy of the measuring devices shall fall within the following limits.

Measurement of Cement	±2% of the quantity of cement in each batch
Measurement of Mineral Admixture	±2% of the quantity of cement in each batch
Measurement of Water	±3% of the quantity of water in each batch
Measurement of Aggregate	±3% of the quantity of aggregate in each Batch
Measurement of Admixture	±3% of the quantity of admixture in each Batch

- In a batching plant, the concrete production equipment shall be calibrated initially at the time of installation or reconditioning of the equipment and subsequently at the following intervals-Mechanical/knife edge system: At least once in every two months. Electrical or load cell system: At least

once in every three months.

NOTE: All ingredients of concrete shall be used by mass except water and admixtures which may be by volume.

- It is important to maintain the water-cement ratio constant at its correct

value. To this end, determination of moisture contents in both fine and coarse aggregates shall be made as frequently as possible, the frequency for a given job being determined by the engineer-in- charge according to weather conditions. The amount of the added water shall be adjusted to compensate for any observed variations in the moisture contents. For the determination of moisture content in the aggregates, IS 2386 (Part 3)

may be referred to. Where batching plants are used, it is recommended to determine moisture content by moisture probes fitted to the batching plants. To allow for the variation in mass of aggregate due to variation in their moisture content, suitable adjustments in the masses of aggregates shall also be made.

- **Mixing Concrete:**

The mixer in the batching plant shall be so arranged that mixing action in the mixers can be observed from the operator's station. The mixer shall be equipped with a mechanically or electrically operated timing, signalling and metering device which will indicate and assure completion of the required mixing period. The mixer shall have all other components as specified in IS: 4925.

- **<u>Transportation, Placing and Compaction of Concrete:</u>**

Mixed concrete from the batching plant shall be transported to the point of placement by transit mixers or through concrete pumps or steel closed bottom buckets capable of carrying 0.6 cum concrete. In case the concrete is proposed to be transported by transit mixer, the mixer speed shall not be less than 4 rev/ min. Of neither the drum nor greater than a speed resulting in a peripheral velocity of the drum as 70 m / minute at its largest diameter. The agitating speed of the agitator shall be not less than 2 rev / min. Nor more than 6 rev / min. of the drum. The number of revolutions of the mixing drum or blades at mixing

speed shall be between 70 to 100 revolutions for a uniform mix, after all ingredients, have been charged into the drum. Unless tempering water is added, all rotation after 100 revolutions shall be at agitating speed of

2 to 6 rev / min. And the number of such rotations shall not exceed 250. The general construction of transit mixer and other requirements shall conform to IS: 5892.

In case concrete is to be transported by pumping, the conduit shall be primed by pumping a batch of mortar / thick cement slurry through the line to lubricate it. Once the pumping is started, it shall not be interrupted (if at all possible) as concrete standing idle in the line is liable to cause a plug. The operator shall ensure that some concrete is always there in the pump-receiving hopper during operation. The lines shall always be maintained clean and shall be free of dents.

Materials for pumped concrete shall be batched consistently and uniformly. Maximum size of aggregate shall not exceed one-third of the internal diameter of the pipe. Grading of aggregate shall be continuous and shall have sufficient ultra-fine materials (materials finer than 0.25mm). Proportion of fine aggregates passing through 0.25mm shall be between 15%& 30% and that passing through 0.125 mm sieve shall not be less than 5% of the total volume of aggregate. Suitability of concrete shall be through pumping shall be verified by trial mixes and by performing pumping tests.

- **Preparation of Mixes as Per Approved Design Mix and Conducting Confirmatory Test at Field Lab:**

The contractor shall make the cubes of trial mixes as per approved Mix design at site laboratory for all grades, in presence of Engineer in charge using sample of approved materials proposed to be used in the work prior to commencement of concreting and get them tested in his presence to his entire satisfaction for 7 days and 28 days. Test cubes shall be taken from trial mixes as follows.

For each mix, a set of six cubes shall be made from each of the three consecutive batches. Three cubes from each set of six shall be tested at age of 7 days and remaining three cubes at age of 28 days. The cubes shall be made, cured, transported and tested strictly in accordance with specifications. The average strength of nine cubes at age of 28 days shall exceed the specified target mean strength for which design mix has been approved, the evaluation of test results will be done

as per IS: 456-2000.

- **Ultrasonic Pulse Velocity Method of Test for RCC:**

The underlying principle of assessing the quality of concrete is that comparatively higher velocities are obtained when the quality of concrete in terms of density, homogeneity and uniformly is good. The consistency of the concrete as regards its general quality gets established. In case of poorer quality lower velocities are obtained. If there are cracks, voids or flaws inside the concrete which come in the way of transmission of pulse, lower velocities are obtained.

The quality of concrete in terms of uniformity, incidence or absence of internal flaws, cracks and segregation etc. Indicative of the level of workmanship employed, can thus be assessed using the guidance given in table below, which have been evolved for characterizing the quality concrete in structure in term of the ultrasonic pulse velocity.

Velocity criterion for Concrete Quality Grading.

Sl. No.	Pulse velocity by Cross Probing (km/sec)	Concrete Quality Grading
1	Above 4.5	Excellent
2	4.5 to 3.5	Good
3	3.5 to 3.0	Medium
4	Below 3.0	Doubtful

Note: In Case of “doubtful” quality it may be necessary to carry further tests.

Pulse velocity method of test of concrete is to be conducted as a routine test. The acceptance criteria as per the above table will be applicable which is as per IS 13311 (part-1): 1992. From the above “Good” and “Excellent” grading are acceptable and below these grading the

concrete will not be acceptable.

All RCC Columns and 5% of the other of RCC members in each category i.e., Beam, column, slab and footing may be tested by UPV test method for establishing quality of concrete. It is suggested that test be conducted on RCC beam near joint with column, on RCC column near joint with beam, on RCC footings and rafts. On RCC rafts a suitable grid can be worked out for determining number of tests. In addition, doubtful areas such as honey-combed locations, locations, where continuous seepage is observed, construction joints and visible loose pockets will also be tested.

The test results are to be examined in view of the above acceptance criteria "Good" and "Excellent" and wherever concrete is found with less than required quality as per acceptance criteria, repairs to concrete will be made. Honeycombed areas and loose pockets will be repaired by grouting using Portland Cement Mortar/Polymer Modifies Cement Mortar /Epoxy Mortar, etc. After chipping loose

concrete in appropriate manner. In areas where concrete is found below acceptance criteria and defects are not apparently visible on surface, injecting approved grout in appropriate proportion using epoxy grout /acrylic Polymer modified cements slurry made with shrinkage compensating cement / plain cement slurry etc. will be resorted to for repairs. Repairs to concrete will be done till satisfactory results are obtained as per the acceptance criteria by retesting of the repaired area. If satisfactory results are not obtained dismantling and relaying of concrete will be done.

3.22 CONSTRUCTION JOINTS

Construction joints in PCC, RCC and Light Weight Concrete works etc., shall be provided only at places as per approved structural drawings. It shall not in any manner structurally or functionally affect the structure. If, any additional construction joint is required to be provided, it shall be done with approval of the Engineer-in-Charge. The centering, shuttering, strutting etc., required for the construction joint in PCC, RCC and Light Weight Concrete works shall be provided as per the CPWD Specifications. Nothing extra

shall be payable on this account.

3.23 TREATMENT TO THE CONSTRUCTION JOINTS AND RECTIFICATION OF DEFECTS

(i) All care shall be taken to minimize the number of construction joints in the basement raft and walls as well as in the levelling course of PCC at base. Still, wherever the construction joints are provided, these shall be slightly opened up and then suitably filled with cement mortar 1:3 (1 cement: 3 fine sand) after applying a bond coat of cement slurry. The aluminium nipples shall be fixed in the cavity and crevices, if required. Then cement slurry of w/c ratio0.5 shall be pressure grouted through these nipples as required, which shall then be suitably cut. Nothing extra shall be payable on this account.

(ii) All care shall be taken to avoid any honey combed concrete or any cavity. Still, if any honey combed concrete or cavity in RCC wall is encountered the same shall be rectified by removing all loose concrete by chiseling. The chipped concrete surface shall be cleaned and made dust free by blowing compressed air anathematized clean with water (but without excess water). Then a bond coat of polymer modified cement slurry @ 2.2 kg of cement per sq. m. of concrete surface, in two coats, shall be applied as specified. The second coat shall be applied immediately within 15-20 minutes of application of the first coat. A coat of polymer modified cement plaster of mix 1:3 (1 cement: 3 fine sand) of the required thickness shall be applied as specified to fill the cavity if the required thickness is less than 20 mm. If the required thickness is more than 20 mm. the cavity shall be filled by concrete of relevant grade after providing the required centering and shuttering. The surface shall then be moist cured for minimum 7 days. Nothing extra shall be payable on this account.

4.0 **SHUTTERING / FORMWORK**

4.1 The work shall be done in accordance with CPWD Specifications - 2019 - Vol. I & Vol. II with upto date correction slips.

4.2 Steel/ Aluminum shuttering as per schedule of quantity and as approved by the Engineer-in-Charge shall be used by the contractor. Minimum size of shuttering plates shall be 600mm x 900mm except for the case when closing pieces required to complete the shuttering panels.

Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work.

4.3 The shuttering plates shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or debonding compound shall be applied on the surface of the shutter plates in the requisite quantity before assembly of steel reinforcement.

4.4 The joint filler shall be resilient closed cell expanded polyethene and non-tainting as manufactured by Supreme Industries Ltd.

4.5 The contractor shall use 2 sets of shuttering materials for individual buildings for alternative repetitions. In no case, the shuttering shall be moved from one building to another without prior written permission of the Engineer-in-charge. Also, the agency shall not be allowed to remove the form work of any floor without casting of subsequent floor above. As such, the agency is required to provide marking over shuttering materials depicting the concerning blocks.

4.6 Providing joint filler of required thickness in position to substrate using either double sided foam adhesive tape or neoprene synthetic rubber adhesive. When forming expansion joint with the Board in in-situ concrete, joint sealing slots can be readily formed in the following matter-

a) Before installing, simply cut off a strip of the required depth. Then install the filler flush with the finished surface.

b) Prior to sealing, the top strip can then be pulled easily from the joint to provide an uncontaminated sealing slot ready for preparation and sealing.

5.0 REINFORCEMENT

5.1 The reinforcement shall be done as per CPWD Specifications - 2019 - Vol.I & Vol. II with upto date correction slips.

5.2 The item of cut and bend reinforcement of RCC work includes all operations including straightening, cutting, bending, welding, binding with annealed steel or welding and placing imposition at all the floors with all leads and lift complete as per CPWD Specification - 2019 - Vol.I & Vol. II with upto date correction slips.

5.3 To avoid displacement of bars in any direction and to ensure proper cover, only factory-made round type/rectangular cover blocks shall be used by the contractor. Nothing extra shall be payable on this account.

7. BRICK/AAC BLOCK WORK

7.1 Unless otherwise specified FPS Bricks shall be used in all items of brick work. The classification of bricks brought by the contractor shall strictly conform to CPWD Specifications –2019 Vol-1 & II with upto date correction slips or as specified. The work shall also include for leaving chases / notches for dowels / cramps for all kinds of cladding to come over brick work.

7.2 The AAC Blocks shall be procured from a reputed manufactures as per approved make list with the approval of Engineer-in-charge.

7.3 The blocks shall be stored at site in stacks on a level dry surface.

7.4 The mortar used for joining the blocks shall be mixed in the proportion as per mentioned in the items,

7.5 The joints in the masonry shall be recessed and no flush pointing shall be done.

7.6 A slip membrane with PVC sheet shall be introduced as per the recommendation of blocks manufacturer before laying the first course on the plinth beam.

7.7 The blocks shall not be soaked in water and instead they shall be dipped in water and taken out immediately to have only moist surface.

7.8 The vertical joints of the masonry shall be broken to have a minimum overlap of 100 mm.

7.9 Bed joint reinforcement bars may be placed in the joints after every 4th course in two successive layers as per the recommendation of the manufacturers to have good lateral stability.

7.10 It shall be ensured that the lintels are rest at either end of window opening only on full bocks and not on half or part blocks reinforcement shall be placed in the sill course of window openings in two successive horizontal joints and extend the same at least to 600 mm on either side of the jams surface.

7.11 At a RCC column interface an MS anchor (“L” –shape) may be placed and fixed with screws at every 4th course so as to anchor the wall with RCC column for better lateral stability. Cost of the same is included in the

rate of the masonry item in BoQ.

7.12 Curing of the masonry shall be done only by spraying water and no flooding shall be done by water jets / buckets.

7.13 The chases in the wall surface for electrical conduits shall be done only by means of electrically operated saw to cut two parallel lines and the portion between the cuts shall be chiseled carefully. The depth of vertical chases should be limited to 1/3rd of wall thickness and horizontal chases should not be more than 1/6th of wall thickness. The chases have to be properly packed with cement mortar 1:8 (1 cement: 8 sand) between pipes and chases.

7.14 The blocks shall be cut using a carpenter saw to have half blocks or any other suitable size block to close the masonry course or to break the vertical joint from the bottom course. Hammer or a mason's trowel shall not be used to cut the blocks.

7.15 Plaster mesh shall be fixed on all column wall and beams wall junctions before taking up the plaster work.

8. STONE/ MARBLE/ GRANITE WORK (OTHER THAN MASONARY)

8.1 The execution of stone work shall be in general asper CPWD Specifications - 2019-Vol.I & Vol. II with upto date correction slips.

8.2 All holes, rebates, recesses etc. for providing fixing and inserts shall be predrilled and precut and worked using precision machine tools. Nothing extra on this account shall be payable.

8.3 Samples of each item of stone work either individually or in combination shall be prepared for approval of Engineer-in-Charge before commencement of work.

8.4 Sequence of execution for cladding work shall be suggested by the contractor for approval of Engineer-in-Charge.

8.5 Single piece granite stone shall be used in treads and risers or any other shade of equivalent price.

8.6 For main entrance steps, nosing of the steps should be double granite edge moulding including finishing polishing complete as direction of the Engineer-in-charge.

8.7 Edge moulding with half round nosing and 40mm wide sand blasted strip to a distance 50mm from the edge of the tread to create contrasting colour.

8.8 Tactile tile/ SS studs (for vision impaired persons as per standards) of approved make in all colours and shades, laid on 20mm thick base of cement mortar 1:4 (1 cement :4coarse sand) in all shapes & patterns including grouting the joints with epoxy grout of matching shade.

9. SCAFFOLDING

9.1 Double steel scaffolding 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.

10. WOOD WORK/WPC WORK

10.1 The wood work in general shall be carried out as per CPWD Specifications- 2019 Vol.I &II with upto date correction slips.

10.2 The samples of species of timber to be used shall be got approved and deposited by the contractor with the EE before commencement of the work. The contractor shall produce cash vouchers and certificates from kiln seasoning or/and chemical treatment plants about the timber section to be used on the work having been kiln seasoned or/and chemically treated by them. The E-I-C or his authorized representative will inspect the raw material during seasoning process at particular plant.

10.3 Factory made shutter as specified shall be obtained from factories approved by the Engineer in charge. The contractor shall inform well in advance to the Engineer-in-charge the names and address of the factory from where the contractor intends to get the shutters manufactured. The contractor will place order for manufacture of shutters only after written approval of the Engineer-in-charge in this regard is given. The contractor is bound to abide by the decision of the Engineer-in-charge and recommend a name of another factory from the approved list in case the factory already proposed by the contractor is not found competent to manufacture quality shutters. Shutters will however be accepted only if this meets the specified tests. The contractor will also arrange stage wise inspection of the shutters at factory to the Engineer-in-charge or his authorized representative. Contractor will have no claim if the shutters brought at site are rejected by Engineer-in-charge in part

or in full lot due to bad workmanship / quality even after inspection of factory. Such shutters will not be measured and paid and the contractor shall remove the same from the site of work within 7 days after the written instruction in this regard are issued by Engineer in Charge or his authorized representative.

10.4 All fittings and fixtures shall be got approved from the Engineer-in Charge before procurement well in advance and the approved samples shall be kept at site till completion of the work.

10.5 Glazing for toilets shall be of translucent type.

10.6 The shape and size of beading shall be as per drawings. The joints of beading shall be mitred.

10.7 120 minutes Frie Rated Metal door Shutter for Electric Shafr,ELV shaft , Refuge area, Stair case shaft

Providing and fixing factory-manufactured, double-skin, single-leaf, metallic fire-rated M.S. door set, comprising M.S./galvanized steel door frame, shutter/door leaf, fire-resistant insulation, fire-rated hardware, vision panel where specified, intumescent fire seals, fire-rated sealant, fixing fasteners and all necessary accessories, complete as a tested and certified assembly for Frie Rated Metal door Shutter for Electric Shafr,ELV shaft, Stair case shaft , conforming to the requirements **of CPWD Specifications-2019, Clause 9.29, issued by Directorate General, CPWD, Nirman Bhawan, New Delhi – 110011 MoHUA / DG (Works) / 24 Date: 01/10/2024**

10.7 60-minute fire-rated wooden door assembly

Providing and fixing **factory-manufactured, single-leaf, 60-minute fire-rated and smoke-check, asbestos-free composite wooden door assembly**, complete with fire-rated wooden frame, shutter, intumescent/smoke seals, fire-rated hardware, fittings, fixtures, fixing accessories, finishing and all necessary components, conforming to the requirements of the **approved tested doorset assembly**, as specified below and complete in all respects.

The **door frame** shall be manufactured from well-seasoned **second-class teak wood or other approved hardwood**, of minimum finished section **120 mm × 70 mm**, or such section as required by the approved manufacturer's tested fire-rated doorset. The frame shall be single-rebated and provided with suitable grooves/recesses for fixing **intumescent fire seals and smoke seals**. The frame shall be treated with approved **anti-termite and fire-retardant treatment** and shall be free from defects, knots and imperfections affecting its fire performance and durability.

The frame shall be fixed securely to the masonry/RCC/steel opening using approved **fire-rated mechanical fasteners/anchors**, minimum 10 mm diameter × 120 mm long or equivalent, at suitable spacing and locations in accordance with the manufacturer's tested installation details. The gap between frame and wall/opening shall be properly packed and sealed with approved **fire-resistant mineral wool/fire-rated backing material and fire-rated sealant**, as applicable, to maintain the specified fire and smoke resistance.

The **door shutter** shall be a factory-manufactured, single-leaf, composite wooden fire-rated shutter of minimum thickness **45 mm and maximum 57 mm**, or such thickness as required by the approved tested 60-minute doorset. The shutter shall incorporate **hardwood stiles and rails**, with minimum approximate section **75 mm × 37 mm**, or as required by the approved manufacturer's tested construction, suitably jointed, reinforced and bonded to form a rigid fire-rated shutter.

The shutter shall comprise an approved **fire-resistant, asbestos-free core construction**, incorporating calcium silicate/fire-resistant boards, fire-resistant insulation core and other components as required by the manufacturer's certified/tested construction. The density, thermal conductivity, fire resistance and other properties of the core materials shall conform to the manufacturer's approved technical specifications and the applicable fire-test/classification certificate.

The faces of the shutter shall be finished with **minimum 3 mm thick commercial plywood and 1 mm thick decorative laminate**, or other approved facing material forming part of the manufacturer's tested fire-rated construction. The exact face construction, thickness and bonding system shall conform to the **approved tested assembly**.

The exposed edges of the shutter shall be provided with **second-class teak wood/hardwood lipping**, securely fixed/bonded and finished smooth. Exposed teak wood frame, lipping and wooden beads/architraves shall be finished with approved **melamine polish or other approved finish**, including preparation, sanding and required coats, complete.

The door shutter shall be provided with **approved heat-activated intumescent fire seals and smoke seals**, minimum nominal size **10 mm × 4 mm**, or such size and configuration as specified in the approved manufacturer's tested assembly. The seals shall be installed continuously in the designated grooves of the frame and/or shutter and shall be suitable for maintaining the specified **60-minute fire and smoke resistance**.

The item shall include **four numbers SS ball-bearing hinges per shutter**, minimum nominal size **102 mm × 76 mm × 3 mm**, or such number and size as required by the approved tested doorset, complete with stainless-steel screws and suitable fire-rated fixing arrangements.

The door shall be provided with **one approved fire-rated mortice lock**, suitable for a minimum 60-minute fire-rated doorset, with key-operated cylinder/latch bolt, together with **fire-rated lever handles on both sides**, escutcheons and all necessary fixing accessories. The lock, cylinder, handles and other hardware shall be compatible with and, wherever applicable, included within the manufacturer's tested/certified fire-door assembly.

The item shall also include, wherever required by the approved drawings/manufacturer's tested assembly, **door closer, tower bolts, flush bolts, door coordinator, kick plate, vision panel, panic hardware or other fire-rated hardware**, as mentioned in the

nomenclature of Schedule of quantity and usage. Where any additional hardware is required to maintain the certified fire rating, the same shall be of approved fire-rated type and included in the complete doorset.

All screws, bolts, anchors, brackets, packers, washers, fixing plates, stainless-steel screws, fire-resistant sealants, intumescent materials, smoke seals and other accessories required for proper installation shall be included in the rate.

A **minimum 25 mm wide teak wood architrave/beading** shall be provided on one side of the frame, or as shown in the approved drawings, including fixing, jointing and finishing.

The complete doorset shall be provided with necessary **door stops, rebates and clearances** as per the approved manufacturer's tested installation details. The clearances between shutter, frame, threshold and other components shall be maintained strictly within the limits specified in the applicable fire-test certificate and manufacturer's installation instructions.

The complete assembly comprising **frame, shutter, stiles, rails, core, facing materials, lipping, intumescent seals, smoke seals, hinges, lock, handles, door closer where applicable, fixing arrangements, perimeter fire stopping and all associated components** shall be capable of achieving a **minimum 60-minute fire-resistance rating as a complete installed doorset**.

The contractor/manufacturer shall submit, before approval/procurement, a valid **fire-test certificate/classification report for the complete doorset**, demonstrating a minimum **60-minute fire-resistance performance**, tested in accordance with **BS 476 Part 22 and/or IS 3614 (Part 2)**, or other applicable standard accepted by the Engineer-in-Charge and competent Fire Authority. The certificate shall correspond to the proposed frame, shutter construction, thickness, hardware, seals and installation configuration.

The proposed product may be from **any approved/specialist manufacturer**, provided the complete doorset complies with the specified performance requirements. The contractor shall submit the manufacturer's **technical literature, sectional drawings, construction details, fire-test certificate, classification report, hardware schedule, installation methodology and manufacturer's declaration** for approval before manufacture and installation.

No change in the **shutter thickness, frame section, stiles, rails, core material, facing material, intumescent seals, hardware, fixing arrangement or other tested components** shall be permitted without prior approval where such change affects the certified fire performance of the doorset.

The complete doorset shall be manufactured, supplied and installed by an **approved specialist fire-door manufacturer/agency**, including transportation, handling, preparation of opening, frame fixing, shutter hanging, alignment, adjustment, installation of fire and smoke seals, fixing of all hardware and accessories, fire stopping around the frame, polishing/finishing, testing, certification, making good and all incidental works.

The work shall be executed in accordance with the approved drawings, CPWD specifications, applicable provisions of the National Building Code of India, applicable fire-safety requirements, approved manufacturer's installation instructions and the directions of the Engineer-in-Charge/competent Fire Authority, wherever applicable.

The rate shall be for the complete 60-minute fire-rated wooden doorset and shall include frame, shutter, stiles, rails, fire-resistant core, facing, lipping, architrave, intumescent and smoke seals, hinges, fire-rated mortice lock, cylinder, lever handles, fixing fasteners, anchors, screws, fire-rated sealants, fire stopping, finishing, testing, certification, installation and all materials, labour and accessories necessary to make the doorset fully operational and complete in all respects.

Testing and Certification

The complete doorset shall have a valid **fire-test certificate/classification report demonstrating a minimum 60-minute fire-resistance performance**, tested in accordance with **IS 3614:2021** and/or other applicable fire-testing standard accepted by CPWD and the competent Fire Authority.

The fire-test certificate shall correspond to the **complete proposed configuration**, including frame, shutter, core, reinforcement, intumescent seals, hardware, where applicable and installation arrangement.

The contractor shall submit, before manufacture/procurement:

i) Manufacturer's fire-test certificate/classification report.

ii) ISI/BIS certification/marking wherever applicable.

iii) Detailed door and frame sectional drawings.

iv) Shutter construction and insulation-core details.

v) Stile and rail details.

vi) Hardware schedule.

vii) Intumescent and smoke-seal details.

viii) Frame anchoring/fixing details.

ix) Perimeter fire-stopping details.

x) Manufacturer's installation instructions and undertaking that the proposed doorset is identical to the tested/certified configuration.

Completion

The complete Wooden fire-rated door set shall be supplied and installed by an **approved/specialist fire-door manufacturer**, including transportation, handling, preparation of opening, frame fixing, anchoring, shutter hanging, alignment, levelling, adjustment, installation of fire seals and hardware, perimeter fire stopping, powder-coated finish, testing, certification, making good and all incidental works.

10.8 Non Fire rated Glazed Metal door shutter for Fire Shaft

Providing and fixing factory-manufactured, double-skin, single-leaf, glazed galvanized steel door assembly, minimum 46 mm overall thickness (as per manufacturer's specification; for thickness more

than 46 mm, nothing extra shall be paid), of box-type construction, fabricated from 20-gauge (0.95 mm thick) galvanized steel sheets, with lock-seam joints at stile edges, punched slots/provisions for fixing hardware and suitable internal reinforcements at top, bottom, stile and hardware fixing locations, complete as per approved drawings and manufacturer's standard tested/approved construction.

The door shutter shall be fabricated with vertical stiles and horizontal top and bottom rails of minimum 100 mm finished width, suitably press-formed, stiffened and reinforced to provide adequate rigidity, strength and dimensional stability. The stiles and rails shall be of box-type construction, integral with the door shutter, and of suitable depth to accommodate the specified minimum shutter thickness, internal filling and reinforcement. The construction, jointing and reinforcement of stiles and rails shall be as per the manufacturer's standard design and approved shop drawings.

The hollow space within the door shutter shall be properly filled with expanded polystyrene (EPS/thermocol) sheets of suitable thickness, or other approved equivalent lightweight insulating/filling material as per the manufacturer's specification, accurately cut and fitted without undue voids, gaps or loose portions, so as to provide adequate internal filling, insulation, rigidity and dimensional stability.

The shutter shall be provided with 6 mm thick clear float glass, securely fixed in the designated glazed opening with suitable galvanized steel/stainless-steel glazing beads, gaskets and glazing accessories. The glazing opening shall be suitably reinforced and the glazing arrangement shall be securely integrated with the shutter stiles and rails. All glazing beads, gaskets, fixing screws and accessories shall be included in the rate.

The door frame shall be fabricated from 18-gauge (1.27 mm thick) galvanized steel sheet, accurately press-formed to a single-rebate profile of nominal finished size 80 mm × 50 mm, with suitable internal reinforcement, fixing provisions and hardware reinforcement wherever required. The frame shall be true to line, level and plumb

and shall be suitable for accommodating the specified shutter thickness and glazing arrangement.

The frame shall be securely anchored to the surrounding masonry/RCC/structural opening using approved galvanized/stainless-steel fixing anchors, brackets, fasteners or equivalent fixing arrangements, including necessary packing, shims and adjustments. The frame shall be properly aligned, plumbed, levelled and securely fixed before hanging the shutter.

The frame, shutter, stiles, rails, glazing beads and all exposed galvanized steel surfaces shall be factory-finished with polyester powder coating of minimum 50 microns dry-film thickness, in the approved colour and shade. The coating shall be uniform, smooth, continuous and free from visible defects, runs, pinholes, blisters, peeling or other imperfections.

The item shall include providing and fixing SS ball-bearing hinges of size 102 mm × 76 mm × 3 mm, complete with stainless-steel screws and suitable reinforcement/fixing provisions in the shutter and frame. The number of hinges shall be as required for the approved shutter size and manufacturer's recommendations, with a minimum of three hinges per shutter, unless otherwise specified in the approved drawings.

The door shall be provided with one SS 304 shaft mortice deadlock, having 50–80 mm backset, minimum 20 mm square forend, Allen-key-operated mechanism and SS 304 dead strike plate, conforming to the applicable requirements of IS 16015:2022 and/or EN 12209, as applicable. The lock shall be suitably reinforced and securely fixed to the door stile and frame.

The item shall also include one recessed flush pull handle of SS 304, minimum size 40 mm × 120 mm, complete with all necessary fixing screws and accessories.

All necessary screws, bolts, washers, brackets, anchors, fixing plates, glazing beads, gaskets, hardware reinforcements, accessories and

other fixing materials required for the complete installation shall be included in the rate.

The hollow spaces within the door frame shall, wherever required by the manufacturer's installation system or approved drawings, be filled with suitable polyurethane foam (PUF) or other approved compatible insulating/filling material after installation, ensuring that the frame remains properly aligned and that the filling does not distort the frame or interfere with the operation of the shutter and hardware.

The complete assembly shall be factory-manufactured and supplied by an approved/specialist manufacturer and shall include transportation, handling, protection, preparation of opening, frame installation, anchoring, alignment, levelling, plumbing, shutter hanging, adjustment, glazing, installation of hardware, sealing, filling of frame cavities where required, making good and all incidental works necessary for proper completion.

The complete door assembly shall be installed strictly in accordance with the approved shop drawings, manufacturer's specifications and installation instructions, CPWD specifications, applicable Indian Standards and directions of the Engineer-in-Charge, ensuring smooth operation of the shutter, proper closing and locking, uniform clearances and satisfactory performance of all hardware and accessories.

The rate shall be inclusive of all materials, labour, transportation, loading and unloading, tools and equipment, frame, shutter, stiles, rails, EPS/approved internal filling, 6 mm clear float glass, glazing beads and gaskets, powder coating, hinges, SS 304 mortice deadlock, strike plate, recessed flush pull handle, fixing fasteners, anchors, screws, PUF filling where required, sealants, accessories, installation, adjustment, making good and all incidental works, complete in all respects as per approved

11. STEELWORK

11.1 Work shall be carried out as per CPWD Specifications - 2019 - Vol.I & Vol. II with upto date correction slips.

11.2 The rate of T- angle iron frame shall include the following.

11.2.1 M.S. sill/tie of 10mm dia bar welded to T-iron frames to keep the frames vertical in correct position. The sill/ tie shall be embedded in floor concrete. No tie is necessary for window frames.

11.2.2 Each T –iron frame for doors shall have 4 Nos. M.S. lugs 15x3mm, 10 cm long welded to each vertical member of the frame.

11.2.3 M.S. flat 6 x 25mm, 100mm long having threaded holes (No. of flats shall correspond to the no. of butt hinges to be fixed to door / window shutters) shall be welded at appropriate places at the back of the T-iron frames for fixing the required butt hinges to the frame with machine screws.

11.3 All welded structural steel work shall be tested for quality of weld as laid down in IS:822-1970 before actual erection if required.

12. FLOORING

12.1 All work in general shall be carried out as per CPWD Specifications-2019 - Vol.I & Vol. II with upto date correction slips.

12.2 Whenever flooring is to be done in patterns tiles/ stone, the contractor shall get samples of each pattern laid and approved by the Engineer-in-Charge before final laying of such flooring for which nothing extra shall be paid.

12.3 Different stones/ tiles used in pattern flooring as per the approved architectural drawings and nothing extra for laying pattern flooring shall be paid. No additional wastage if any shall be accounted for any extra payment.

12.4 The proper gradient shall be given to flooring for toilets, verandah, kitchen, court yard, etc. as per the directions of Engineer-in-Charge. For this there may be extra thickness of dry mortar below the tiles/stone slabs. These gradients should be insured in the shuttering itself. Nothing extra shall be paid for this as this shall to be included in the tendered cost.

12.5 The rate of items of flooring is inclusive of providing sunken flooring in bathrooms ,kitchen, balcony etc. and nothing extra on this account is admissible. The floor below work top shall be raised by 75mm with granite skirting and flooring. The samples of flooring, dado & skirting as per approved pattern shall be prepared & got approved from the Engineer-in-charge before execution of work.

12.6 CeramicTiles / VitrifiedTiles Work /Granitestone flooring

12.6.1 Work shall be carried out as per CPWD Specifications- 2019 Voll &II with up-to-date correction slips and as per manufactures specifications.

12.6.2 Rates shall be inclusive of all operations including labour, material, T&P, scaffolding etc. complete. Nothing extra shall be payable on any account.

12.6.3 One-piece Granite stone for treads/ risers in staircase shall be used and nothing extra shall be paid on this account.

12.6.4 POP protection layer shall be laid on all finished floors for protection from damage during execution of other items of work in that area which shall be removed and cleaned just before handing over of the premises for which nothing extra shall be paid.

12.6.5 The testing of tiles shall be carried out at prescribed frequency and methodology as per IS 13630.

12.6.6 The testing of granite slabs shall be carried out at frequency as specified in CPWD specifications foreach lot.

12.6.7 PVC beading of required size at all exposed corner of the tile dado has to be provided in corridor and toilets for which nothing extra shall be paid.

13. STAINLESS STEEL RAILING/ HAND RAILS:

13.1 The contractor shall apply all materials, labour, tools, ladders, scaffolding and other equipment necessary for the completion and protection of all stainless-steel work.

13.2 All stainless-steel pipes and plates shall conform to AISI 316 grade and the relevant clauses associated with this grade of steel to be followed.

13.3 Surface finish of all the stainless-steel materials will be in 240 grit satin finish/matt finish.

13.4 Fixing will be done by stainless steel expansion bolts of approved size and make as per Engineer-in-charge and welding to be done by using organ welding rods and the surface being duly finished and cleaned by K2 passivation, which is nitric acid plus fluoric acid solution treatment by which the chances of corrosion will be eliminated and any burn out makes on the metal will also be eliminated.

13.5 All stainless-steel material will have to be coated by a solution of Inox to avoid finger in prints and avoidance of settlement of environment/ atmospheric dust.

14. WATER PROOFING TREATMENT

14.1 Work shall be executed as per CPWD Specifications, 2019 Vol I & II with upto date correction slips.

14.2 The contractor shall associate himself with the specialized firm, to be approved by the Engineer-in-charge in writing, for water proofing treatment for basement/lower ground floor, underground tank and on roofs.

14.3 The brick bats shall be from over burnt bricks. The water proofing compound used in integral water proofing treatment shall satisfy all the performance requirements indicated in IS:2645 and shall be got tested before its use. The compound shall be used @ 2% by weight of cement used or as recommended by the manufacturer.

14.4 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approved of the Engineer-in-Charge in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.

14.5 The finished surface after water proofing treatment for roof slab shall have smooth slope with minimum gradient of 1 in 80.

14.6 Before commencement of treatment on roof surface, it shall be ensured that the outlet drain pipes/ spouts have been fixed and the spout opening have been eased and rounded off properly for easy flow of water.

14.7 The surface where the water proofing is to be done shall be thoroughly cleaned with wire brushes. All loose scales mortar splashes etc. shall be removed and dusted off. The surface shall be treated with neat cement slurry admixed with proprietary water proof compound to penetrate into crevices and fill up all the pores in the surface.

14.8 This cement slurry shall be applied at the junction of parapet

and terrace slab including the vertical face of the parapet.

14.9 After the slurry coat is laid, layer of over burnt brick bats shall be laid in cement mortar of mix as specified by specialist firm but not leaner than 1:5 (1 cement: 5 coarse sand) admixed with proprietary water proofing compound to required gradient and joints filled to half the depth. The bricks bat layer shall be rounded at the junction with the parapet and tapered towards top for a height of 300mm. Curing of this layer shall be done for 2 days.

14.10 After curing the surfaces shall be applied with a coat of cement slurry admixed with proprietary water proofing compound.

14.11 Joints of bricks bat layer shall be filled fully with cement mortar of mix as specified by the specialist firm but not leaner than 1:5 (1 cement: 5 coarse sand) admixed with proprietary water proofing compound and finally top finished with average 20 mm thick layers of cement mortar 1:4 (1 cement: 4 coarse sand) and finished smooth with cement slurry mixed with proprietary water proofing compound. The finished surface shall have marking of 300x300 mm false squares to give the appearance of tiles.

14.12 Curing of water proofing treatment shall be done for a minimum period of two weeks by flooding the water by making compartments etc.

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

14.14 GUARANTEE:

The water proofing work shall carry Ten Years guarantee to be reckoned from the date of completion of the entire work under the contract against faulty workmanship, finishing, unsound materials, efficiency of water proofing treatment and other related problems. **Ten Years Guarantee bond** in prescribed Performa attached herewith as **Annexure-VII** shall be submitted by the contractor which shall also be signed by both the specialized agency and the contractor to meet their liability / liabilities under the guarantee bond. However, the sole responsibility about efficiency of water proofing treatment shall rest with the main contractor. **Ten percent of the cost of water**

proofing work shall be retained as security deposit. This ten percent amount shall be would be released after ten years from the date of completion of the entire work under the contract, if the performance of the work done is found satisfactory. If any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of receipt of intimation of defects in the work. If the defects pointed out are not attended to within the specified period, the same will be got done from another agency at the risk and cost of contractor.However, the security deposit deducted may be released in full against bank guarantee of equivalent amount in favour of Engineer in charge, if so, decided by the Engineer in charge.

The Security deposit against this item of work shall be in addition to the security deposit mentioned elsewhere in contract form.

15. PARTICULAR SPECIFICATIONS FOR HYBRID POLY UREA WATER PROOFING TREATMENT

15.1 Material technical Properties :-

PROPERTY	STANDARD	VALUE
Min Elongation	ASTM D 412	>400 %
Tensile Strength	ASTM D 412	>10 MPa
Tear Strength	ASTM D 624C	Min 45 N/mm

15.2 Surface preparation:-

The surface needs to be clean, dry and sound, free of any contamination, which may harmfully affect the adhesion of the membrane. Maximum moisture content should not exceed 5%. Substrate compressive strength should be at least 25 MPa, cohesive bond strength at least 1.5 MPa. New concrete structures need to dry for at least 28 days. Old, loose coatings, dirt, fats, oils, organic substances and dust need to be removed by a grinding machine. Possible surface irregularities need to be smoothened. Any loose surface pieces and grinding dust need to be thoroughly removed. Cracks on the substrate (wider than 1 mm) required to be open in V-groove manner (5mm x 10mm size) by using mechanical cutter, clean the same and seal with the Polyurethane sealant before overcoating with waterproofing

membrane.The careful sealing of existing cracks and joints before the application is extremely important. Clean concrete cracks and hairline cracks, of dust, residue or other contamination. Prime with epoxy Primer PU allow 2-3 hours to dry. Fill all prepared cracks with PU sealant.

Note :- Do not wash surface with water.

15.3 Priming:-

Once the surface preparation is completed (moisture content <5% before priming), the surface should be primed with Epoxy Primer with a min consumption of 200 gms per sqm. If the surface is highly porous (dry patches visible post application primer), second coat of primer will be required.

15.4 Water Proofing Membrane:-

a) Apply minimum 1.5 mm DFT waterproof spray membrane in all areas to be waterproofed.

b) The Spray applied a two component 100% volume solids fast setting hybrid polyurea will be applied using plural component, high temperature / high pressure proportionating unit, fitted with mechanically purge impingement mix spray gun on concrete surfaces on primed surface.

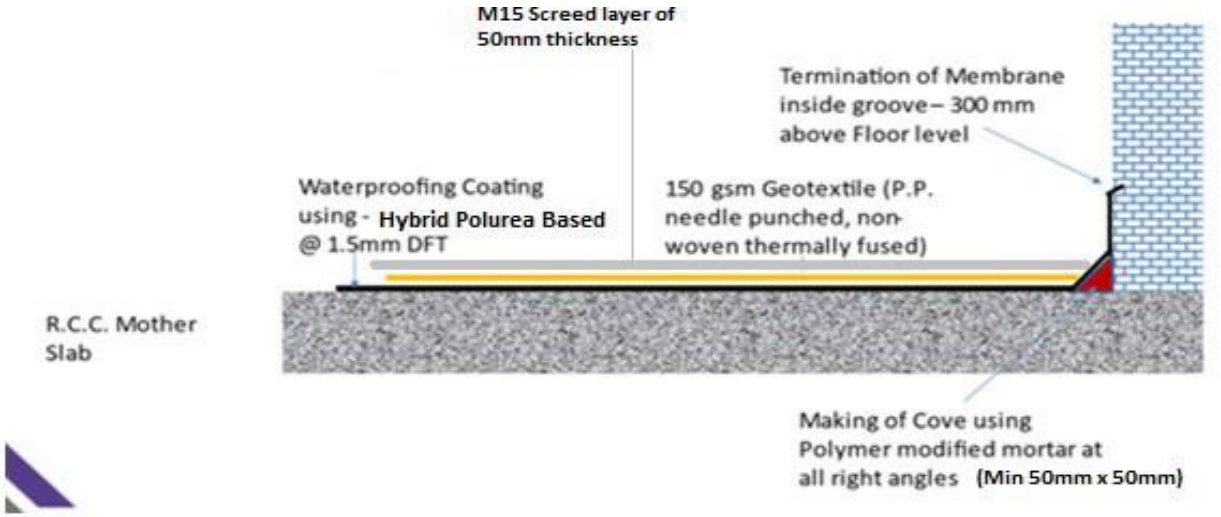
c) Waterproofing spray applied membrane will be terminated minimum 300 mm above the Floor area by making groove of minimum 5mm x 5 mm and waterproofing coating to be terminated inside the groove. After waterproofing coating is completely dry and groove will be sealed using Polyurethane based sealant, flushing with the surface finish. the top edge of retaining wall

15.5 Protection Screed:-

Spread minimum 120 gsm geotextile over cured hybrid polyurea as separation layer, before concrete screed is laid. Protect the liquid applied membrane in maximum 10 days of application using min M15 grade concrete screed of min 50 mm thickness in desired slope to protect the membrane from extended UV exposure and/or from mechanical damages and fill the saw cut joints using PU Sealant.

15.6 Quality Assurance :-

- Water Pond test will be carried out for Horizontal surfaces by ponding water as per ASTM D 5957 Standards for Minimum 72 hours
- The DFT of Waterproof Coating will be checked at minimum 3 locations for every 200 sqm or thereof.
- Pull out Adhesion Test will be carried out at minimum three locations for every 400 sqm or part thereof as per ASTM D 4541 standards.
- All materials delivered at project site will have MTC submitted for every batch delivered.



16. PARTICULAR SPECIFICATIONS FOR PRE-APPLIED FULLY BONDED, HDPE MEMBRANE (As per IS Code 16471:2017)

i) **Material specifications and Process specification**:

a) Surface Preparation

The concrete surface should be float finished and free from cavities and projecting ribs. All surfaces shall be dry and free from frost, contaminations like flaky materials, oil & grease, etc. Standing water must be removed, if any. Grout around all penetrations such as utility conduits, etc. for stability. Large gaps and voids must be pre-filled with cement mortar before the installation of membrane.

b) **Horizontal Substrates**

- Place the membrane with adhesive side facing the concrete pour and HDPE film side facing the substrate.
- End laps should be staggered to avoid a buildup of layers. Accurately position succeeding sheets to overlap the previous sheet by 75 mm along the marked selvedge or as per manufacturer's specifications.
- Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap
- Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller.

c) Roll Ends and Cut Edges

•Overlap all roll ends and cut edges by a minimum of 75 mm and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. The membrane overlaps should be thermo-fused by hot air welding with double seam welding machine to ensure seamless joints. The membrane shall be terminated 50 mm below RCC raft thickness, as per manufacturer's specifications, for proper seaming with the vertical external waterproofing system. All overlaps and joints should be firmly rolled to ensure complete adhesion between layers

d) Corners

Internal and external corners should be formed as per manufacturer's specifications returning the membrane a minimum of 100 mm. Ensure that the apex of the corner is covered and sealed with tape and roll firmly. Cease and fold the membrane to ensure a close fit to the substrate profile and avoid hollows.

e) Storage

Store in a dry condition, store indoors or under cover on pallets. Do not double stack pallets. Material shall be kept away from direct sunlight / UV resistance.

17. PARTICULAR SPECIFICATIONS FOR SBS MODIFIED SELF ADHESIVE WATERPROOFING MEMBRANE TOPPED WITH HDPE VALERON FILM As per IS Code 16471:2017)

i) Material specifications and Process specification:

a) Surface Preparation

The concrete surface should be float finished and free from cavities and projecting ribs. All surfaces shall be dry and free from frost, contaminations like flaky materials, oil & grease, etc. Standing water must be removed, if any. Grout around all penetrations such as utility conduits, etc. for stability. Large gaps and voids must be pre-filled with cement mortar before the installation of membrane. Masonry surface must be flush pointed.

b) Priming

- The surface shall be primed with approved primer @ 5 sqm per litre. Ensure coverage and allow to dry. Only prime an area to which the SBS membrane can be applied the same day.
- Very porous surface may require more than one coat of primer.
- As the viscosity of the primer is very low, it easily penetrates into the concrete pores which promote the adhesion between the membrane and the concrete surface.

c) Application

- Start the installation of all the membrane plies from the low point, so that the flow of water is over or parallel to the plies, but never against the laps. Begin membrane application by unrolling the roll of membrane and aligning the side laps.
- Peel of the release film from the self-adhesive side and start unrolling the membrane and press it to the surface. Smoothen the membrane from the center to the edges with a wooden press in order to remove entrapped air. Furthermore, an iron roll shall be used for rolling on top of the applied membrane to ensure a proper and strong adhesion of the bitumen compound with the base surface.
- Side overlaps shall be a minimum of 75 mm on the selvedge and end overlaps 100 mm.

d) Corners

- Internal and external corners should be formed as per manufacturer's specifications returning the membrane a minimum of 100 mm.

e) **Protection**

•The membrane shall be protected immediately after application from damage, due to ongoing site activities or from sharp aggregates during backfilling.

f) **Storage**

•Store in a dry condition, store indoors or under cover on pallets. Do not double stack pallets. Material shall be kept away from direct sunlight / UV resistance.

18. **Specifications of Non- Schedule Items for high-flexibility cementitious waterproofing**.

1. Item Description: -

Providing and laying waterproofing coating on the sunken portion of the WCs, bathroom on sound and perfectly clean surface, etc. by applying Two-component pre-packed high-flexibility cementitious mortar using a roller or brush to the floor area in a two or more coat and all the coats to be applied in right angle to each other. For waterproofing application by trowel or with a roller approximately 1.6 kg. per sqm. per mm of thickness is required to achieve 2 mm of Dry Film Thickness (DFT) over base concrete having moisture content less than 5% on both horizontal and vertical surfaces. Minimum 5 Days curing to be done before laying tiles.

The coating shall have following properties :

1. Minimum Adhesion to substrate after 28 days 1.0 Mpa, (ASTM D4541)
2. Minimum Crack Bridging Capacity is upto 2.0 mm, (ASTM C1305 modified)
3. Minimum Elongation is 120% (ASTM D 12)

The system should include:

1. Cleaning the surface, removing the laitance, and Small cracks up to 5mm needs to be repaired with crack filling material as per manufacturer's specification.
2. Angle fillet of 50X50mm need to be prepared with Pre packed Polymer

modified mortar as per manufacturer's specification.

3. Pipe penetration up to 120mm dia need to treat with Pre packed Polymer modified mortar of approved make and Pipe penetration in vertical wall – Center part of PVC pipe (Center of width of wall) should be roughened by sandpaper and shall be coated with 2 component epoxy bonding agent followed by micro silica sprinkling on it or fixing of Silica sand topped HDPE tape over roughen surface as per manufacturer's specification.

Protection screed over it with required slope is provided which shall be paid separately in 1:2:4, all complete with material labour and machinery needed, as per manufacturers specifications and directions of Engineer-in-charge.

The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes Nothing extra shall to be paid

2. **Mode of Measurement**:-*Length and* breadth shall be measured along the finished surface correct to a cm and the area shall be worked out to nearest 0.01 sqm.

3. Material & Process Specification: - Material technical Properties:-

PROPERTY	STANDARD	VALUE
Minimum Adhesion	ASTM D 4541	>1.0 Mpa
Crack Bridging Capacity	ASTM C1305 modified	Min 2.0mm
Minimum Elongation	ASTM D412	>120%

Surface preparation: -

The surface needs to be clean, dry and sound, free of any contamination, which may harmfully affect the adhesion of the membrane. Maximum moisture content should not exceed 5%. Substrate compressive strength should be at least 25 MPa, cohesive bond strength at least 1.5 MPa. New concrete structures need to dry for at least 28 days. Old, loose coatings, dirt, fats, oils, organic substances and dust need to be removed by a grinding machine. Possible surface irregularities need to be smoothened. Any loose surface pieces and grinding dust need to be

thoroughly removed.

Cracks on the substrate (wider than 1 mm) required to be open in V-groove manner (5mm x 10mm size) by using mechanical cutter, clean the same and seal with the crack filling material as per manufactures specification before overcoating with waterproofing membrane.

The careful sealing of existing cracks and joints before the application is extremely important.Clean concrete cracks and hairline cracks, of dust, residue or other contamination Note:- Do not wash surface with water.

WATER PROOFING MEMBRANE: -

- Apply minimum 2.0 mm DFT waterproof membrane in all areas to be waterproofed.
- Two-component, high-flexibility cementitious mortar must be applied in at least two coats by trowel or with a roller within 60 minutes of it being mixed, to give a final thickness of at least 2

mm. After the mesh has been laid, finish the surface with a trowel and apply a second layer of same material when the first one has set (after 4-5 hours). In good weather and at normal temperatures, on the other hand, this time may be reduced to 24 hours for dry substrates.

- Waterproofing spray applied membrane will be terminated minimum 300 mm above the Floor area by making groove of minimum 5mm x 5 mm and waterproofing coating to be terminated inside the groove.

PROTECTION SCREED: -

Protect the waterproofing membrane in maximum 10 days of application using min M15 grade concrete screed of min 50 mm thickness in desired slope

4. Quality Assurance:-

- Water Pond test will be carried out for Horizontal surfaces by ponding water as per ASTM D 5957 Standards for Minimum 72 hours.
- The DFT of Waterproof Coating will be checked at minimum 3 locations for every 200 sqm or thereof.
- All materials delivered at project site will have MTC submitted for every batch delivered.

19. FINISHING:

19.1 The work shall be carried out as per CPWD Specifications- 2019 Vol.-I & Vol. II with upto date correction slips.

19.2 All painting material shall be brought to the site of work in the original sealed containers. The material brought to the site of work shall be sufficient for at least 30 days of work. The material shall be kept under the joint custody of contractor and representative of the Engineer-in-Charge. The empty contains shall not be removed from the site till the completion of the work without permission of the Engineer-in-Charge.

19.3 Paint register shall be maintained as per CPWD proforma for periodical verification by CPWD.

20. Special conditions for Building Information Model (BIM) :-

(Ref: Deliberations of the committee for implementation of BIM in CPWD vide OM No.1(2)/T&PR/2023/BIM/09 dated 02/02/2024)

20.1 The scope of work includes preparing building information Models (BIM), 3D Design and coordinated drawing of entire Architectural, MEP works and entire services by use of latest software in vogue like- Revit, Autocad3D, Civil 3D etc.

20.2 The scope of works also covers the verification as per design intent and preparation of layout plans, shop drawings for E & M services, inventories of Fittings, Fixtures, Equipment etc. extracted from BIM LOD 400 .

20.3 The level of detail in BIM to be done as under: -

20.3.1 LOD-350 Level corresponding to “Good for Construction” drawings to be issued for actual execution after award of work by the Engineer-in-Charge.

20.3.2 LOD-400 (Fabrication & Shop drawings) - agency shall submit it to the Engineer-in-charge. These are to be verified and approved as “Good for Construction” for issue to the agency by the Engineer-in-charge.

20.3.3 LOD-500 (As built drawings) agency shall submit after completion of execution work. These are to be checked for correctness

and approved for handing over to client.

20.4 Agency shall get approval of the software used for BIM from the Engineer-In-Charge.

20.5 The agency shall provide BIM software with 2 licenses exclusively with editing rights for the CPWD. If required editing will be done by the consultant with prior permission from Engineer in charge.

20.6 Shop Drawings/details are to be submitted for approval both in Soft and hard copies. These submittals shall be an extract of the relevant BIM files. The Technical Data Sheets (TDS) shall be integrated with BIM documentation and relevant COBie files. The layout plans / drawings / other documents pertaining to E&M services and information with the following details shall have to be submitted for approval, within 7 days before the start of the particular component of work. The Specialized Agency has therefore to be approved, by the Engineer-in- charge, well before this submittal.

20.7 In addition to the above, Engineer-in-charge of the work will submit architectural drawings to the agency who has to develop in LOD 400 (fabrication and shop drawings) and get it verified from the Engineer-in-charge of the work for issuing of Good for construction Drawings.

20.8 Completion Plan: Contractor shall periodically submit completion drawings for all the E&M services as and when work in all respects is completed in a particular area/service. These drawings shall be submitted in soft copy and four colour printouts of suitable scale each containing complete set of drawings on approved scale indicating the work as - installed. All these drawings shall be extracted from the BIM drawings (LOD 500) and shall be submitted with COBie files. These drawings shall clearly indicate the following both building wise and/ or service wise:

I. Location and details of equipment and other particulars.

II. Run of services (piping / cabling / ducting / cable trays etc.).

III. Complete wiring diagram, as installed and scheduled showing all connections in the complete electrical system.

IV. Single line diagram, power schematic, control schematic with

detailed bill of materials, showing makes, types and description of all components and accessories.

V. Details of model numbers, warranty information, escalation matrix in case of complaints, spare parts with their part number etc. as part of the COBie files. For this purpose, the COBie files format shall be submitted to the Engineer in charge for approval.

VI. The escalation matrix shall give contact details including the name, designation, phone number, mobile number, email id and a toll-free number, if available.

VII. Successful contractor shall also furnish the Manufacturer's instructions on Installation, Operation & Maintenance for all the capital items.

20.9 During the progress of the work, the contractor will update the actual progress in the BIM model and submit the required in progress vis-à-vis actual progress through the BIM modelling to the Department **fortnightly** or as and when asked by the Department. **Failure on part of the contractor in this regard shall attract Rs. 10,000/- for each default as penalty**.

20.10 The BIM modelling of LOD 500 (As built drawings) shall be developed by the agency after completion of work and get it checked and corrected from the consultant for handing over to the department.

20.11 The Contractor shall submit 5 sets of "AS BUILT" drawings for all packages (laminated hard copies + soft copy, both in PDF and CAD format), duly updated in BIM model, complete with equipment layout, cable routing, Single line Diagram/ Flow chart, etc. on completion of the work. Completion certificate shall not be recorded without the above compliances.

20.12 In case of any ambiguities, the matter shall be resolved in accordance with para of "Conditions of contract" of applicable GCC.

PARTICULAR CONDITIONS FOR DISMANTLING/DEMOLITION OF EXISTING BUILDING

The work of dismantling/demolition of the existing building shall be carried out strictly in accordance with the CPWD Specifications, relevant IS Codes, CPWD Works Manual, applicable provisions of the Construction and Demolition Waste Management Rules, directions/guidelines of MCGM/MHADA/MPCB/CPCB and all other statutory requirements applicable at the site. The following special conditions shall also be complied with by the Contractor.

Scope of work:Dismantling/Demolishing of Existing Buildings (02 Nos. G+5 Storeyed Buildings)

Dismantling/demolishing of the existing 02 Nos. G+5 storeyed building (Approximate Area-7290.36 sqm), situated at the construction site of the proposed “Construction of Residential Quarters & Guest Rooms for SIB at Mahim”, on “AS IS, WHERE IS” basis, at all heights and levels, including necessary excavation of ground to the required depth and dismantling/demolition of foundations and superstructure, comprising brickwork, RCC, PCC, flooring, doors and windows, partitions, false ceiling, water supply and sanitary lines with fixtures, drainage pipes, electrical lines with fixtures, etc., complete.

The scope shall also include dismantling/removal of surrounding pavements, including PCC, RCC, paver blocks or any other material, as well as dismantling/removal of small structures, whether below or above plinth level, complete, as directed by the Engineer-in-Charge.

The work shall include segregation, removal, loading, unloading, transportation and disposal of unserviceable materials/debris at the authorized municipal dumping ground, including all necessary leads and lifts. Serviceable materials, wherever required, shall be carefully dismantled, taken away and disposed of/handled as directed by the Engineer-in-Charge.

All materials obtained from dismantling/demolition of the existing structures, unless otherwise specified in the Contract, shall be the property of the contractor and shall be at his disposal. However, no serviceable material obtained from the dismantling/demolition shall be used in the proposed work.

It shall be the responsibility of the contractor to completely clear the site after demolition, including removal of foundations and other underground/above-ground obstructions, so as to make the site suitable for setting out/layout and execution of foundations of the proposed new work, as per the approved drawings and directions of the Engineer-in-Charge.

The rate shall be deemed to include all inputs required for complete execution of the work, including materials, labour, tools, plants, equipment and machinery, breaking, dismantling, excavation, loading, unloading, transportation/carriage to the authorized municipal dumping ground, all leads and lifts, disposal of debris and all incidental works, and nothing extra shall be payable on any account.

After completion of dismantling/demolition and clearance of the site, the ground level within the plot shall be the existing minimum road level surrounding the buildings for the proposed construction activities which are part of this tender .The measurement of the proposed building work for payment shall thereafter be taken with reference to the site levels/conditions established after completion of the dismantling/demolition work, as applicable under the Contract.

Approximate area of existing structures: 7290.36 sqm.

1. Pre-Demolition Survey and Approval

1.1 Before commencement of demolition, the Contractor shall carry out a detailed structural and site survey of the existing building, adjoining structures, roads, footpaths, compound walls, underground/overhead utilities and other vulnerable structures.

1.2 A detailed **Pre-Demolition Condition Survey Report**, duly supported with photographs/video recording, shall be prepared and submitted to the Engineer-in-Charge before commencement of the work.

1.3 The Contractor shall engage a **qualified Structural Engineer/Structural Consultant**, experienced in demolition of multi-storeyed structures, for preparation of the demolition methodology, sequence of dismantling, temporary supports, propping, shoring and other safety measures.

1.4 No dismantling/demolition work shall commence until the **Demolition Method Statement, Risk Assessment, Safety Plan and detailed sequence of demolition** have been submitted by the Contractor and approved by the Engineer-in-Charge.

1.5 The demolition shall generally be carried out in the **reverse order of construction**, floor by floor, and shall proceed from the top towards the bottom, unless an alternative method is specifically designed and approved by the competent Structural Engineer and Engineer-in-Charge.

2. Isolation of Services

2.1 Before commencement of demolition, all existing electrical, water supply, drainage, sewerage, gas, fire-fighting, communication, HVAC and other services connected to the building shall be identified and safely isolated/disconnected.

2.2 Written confirmation regarding disconnection/isolation of electrical and other hazardous services shall be obtained from the concerned utility/service agency before demolition of the corresponding portion.

2.3 Particular care shall be taken in respect of underground and overhead electrical lines, water mains, sewer lines, HT/LT cables and other services in the vicinity of the building.

3. Protection of Adjoining Buildings and Public Areas

3.1 Since the work is located in an urban/in habited area, the Contractor shall take all necessary measures to ensure that **no**

damage, settlement, vibration, cracking or other distress occurs to adjoining buildings, roads, footpaths, utilities or public property.

3.2 Adequate shoring, strutting, propping, scaffolding, protective screens, barricading and temporary supports shall be provided wherever required.

3.3 Where the building is located close to an adjoining occupied building, suitable **full-height protective enclosure/screening** shall be provided.

3.4 The Contractor shall not allow any portion of the building, concrete, masonry, reinforcement, glass, metal or other material to fall uncontrolled outside the designated demolition zone.

3.5 No material shall be thrown from any floor or roof. Dismantled material shall be carefully lowered to the ground by suitable mechanical/manual means or through properly designed debris chutes.

4. Demolition Method and Sequence

4.1 Demolition shall be carried out systematically and progressively, floor by floor.

4.2 Demolition by uncontrolled collapse, blasting, burning, impact demolition or any other method likely to endanger adjoining structures/public areas shall not be permitted unless specifically approved in writing by the Engineer-in-Charge and all statutory authorities.

4.3 Load-bearing walls, columns, beams, slabs, staircases and other structural members shall not be removed in a manner that may cause premature collapse.

4.4 The Contractor shall ensure that accumulated demolition debris does not impose excessive load on any floor/slab.

4.5 Heavy machinery such as excavators, breakers, cranes, etc. shall not be operated on upper floors unless the floor load capacity and stability have been specifically verified and certified by the Structural Engineer.

4.6 No structural member shall be cut or removed without ensuring the stability of the remaining structure.

5. Safety of Workers and Public

5.1 The entire demolition area shall be securely barricaded with rigid barricading of adequate height. Entry of unauthorized persons shall be strictly prohibited.

5.2 Warning boards, danger signs, illumination, flagmen/security personnel and access-control arrangements shall be provided as required.

5.3 All workers shall be provided with and shall mandatorily use appropriate PPE, including safety helmets, safety shoes, high-visibility jackets, gloves, goggles/face shields, safety harnesses and respiratory protection wherever required.

5.4 Workers working at height shall be provided with properly anchored safety harnesses and suitable lifelines.

5.5 Proper working platforms, scaffolding, ladders and access arrangements shall be provided. Improvised platforms shall not be permitted.

5.6 Emergency access, fire-fighting arrangements, first-aid facilities, emergency contact numbers and evacuation arrangements shall be maintained throughout the demolition operation.

5.7 A competent Safety Officer/Safety Supervisor shall remain available at site during demolition operations.

6. Dust and Air Pollution Control

6.1 The Contractor shall take all necessary measures to prevent generation and dispersion of dust during demolition, handling, loading, transportation and disposal of debris.

6.2 **Continuous/adequate water sprinkling or mist/fogging** shall be carried out at the point of demolition, debris handling and loading, subject to structural and electrical safety.

6.3 Water shall be sprayed in advance on masonry/concrete surfaces wherever practicable to suppress dust.

6.4 The demolition work shall be enclosed by suitable **dust screens/protective curtains/netting**, particularly on the sides facing adjoining residential buildings, roads, footpaths and public areas.

6.5 Debris chutes, where used, shall be properly enclosed to prevent escape of dust.

6.6 Dry sweeping of accumulated dust/debris shall not be permitted. Wet cleaning or suitable vacuum/mechanical cleaning methods shall be adopted.

6.7 Stockpiling of demolition debris at site shall be avoided. Debris shall be removed progressively and shall not be allowed to accumulate unnecessarily.

6.8 Vehicles transporting debris shall be properly covered with **tarpaulin or equivalent dust-proof covering**.

6.9 Vehicle wheels shall be cleaned/washed before vehicles leave the site, and the adjoining road/footpath shall be regularly cleaned to prevent deposition of mud and dust.

6.10 The Contractor shall comply with applicable CPCB/MPCB dust-mitigation requirements and any additional conditions imposed by MCGM/MHADA/MPCB.

MCGM itself records water sprinkling, curtains/barriers, wheel washing, carriageway/footpath washing and covered transportation of soil/muck as dust-control measures at construction sites.

7. Noise and Vibration Control

7.1 The Contractor shall adopt all reasonable measures to minimise noise and vibration during demolition.

7.2 **Demolition shall not be carried out during night hours**, particularly in inhabited/residential areas. The working hours shall be restricted to the timings permitted by the Engineer-in-Charge and applicable statutory authorities.

7.3 Wherever practicable, low-noise equipment and methods such as hydraulic crushers/cutters shall be preferred over high-impact breaking methods.

7.4 Equipment shall be properly maintained and shall have effective silencers/mufflers.

7.5 Unnecessary idling/revving of construction equipment, vehicles and machinery shall not be permitted.

7.6 Where demolition is close to occupied residential buildings, schools, hospitals or other sensitive premises, suitable acoustic barriers/enclosures shall be provided wherever required.

7.7 The Contractor shall monitor noise levels at the site boundary and at sensitive locations, as directed by the Engineer-in-Charge, and shall immediately implement additional mitigation measures if prescribed limits are exceeded.

7.8 The work shall comply with the **Noise Pollution (Regulation and Control) Rules, 2000**, as amended, and directions of MPCB/MCGM or other competent authorities. MPCB presently provides the applicable Noise Pollution Rules and amendments on its official portal.

8. Control of Falling Debris

8.1 No debris, brick, concrete, reinforcement, glass or other material shall be allowed to fall freely from height.

8.2 Properly designed and securely fixed **debris chutes/enclosed disposal shafts** shall be used wherever required.

8.3 The area below and around the demolition operation shall remain cordoned off during dismantling.

8.4 Temporary protective roofs/canopies shall be provided over pedestrian movement areas wherever required.

9. Traffic and Pedestrian Safety

9.1 Where the building is adjoining a public road/footpath, the Contractor shall obtain all necessary permissions from the

concerned authorities and shall provide suitable barricading, signage, lighting and traffic marshals.

9.2 No demolition debris, machinery or vehicle shall obstruct the public road or footpath.

9.3 Loading/unloading of debris shall be planned so as not to cause traffic congestion or danger to pedestrians.

9.4 The Contractor shall coordinate with MCGM, Traffic Police and other concerned agencies wherever required.

10. Construction and Demolition (C&D) Waste Management

10.1 The Contractor shall comply with the **Construction and Demolition Waste Management Rules, 2016**, as applicable, and all amendments/replacement legislation and directions in force at the time of execution.

10.2 Before commencement of demolition, the Contractor shall submit a **C&D Waste Management Plan**, indicating:

- estimated quantity of C&D waste;
- category/type of waste;
- method of segregation;
- temporary storage arrangement;
- transportation arrangement;
- authorized disposal/recycling facility;
- estimated number of trips;
- route of transportation; and
- records proposed to be maintained.

10.3 C&D waste shall be segregated, to the extent practicable, into concrete/RCC, masonry, steel, wood, glass, plastics and other materials.

10.4 Reusable/serviceable materials such as **TMT reinforcement bars, structural steel, doors, windows, grills, fixtures, bricks,**

flooring materials and other materials of any nature obtained during dismantling/demolition of the existing building shall be carefully removed, segregated, stacked and shall be removed from the site by the Contractor at his own cost, after obtaining clearance from the Engineer-in-Charge. **These material shall become the property of the Contractor.**

10.5 All **rubbish, debris, broken concrete, masonry, plaster and other non-reusable waste materials** generated during dismantling shall be collected, loaded, transported and disposed of by the Contractor at the **nearest authorised/designated MCGM dumping/disposal facility**, as per the prevailing MCGM/MPCB/CPCB requirements and at no extra cost to the Employer.

10.6 The Contractor shall keep the site, adjoining areas and access roads free from accumulated debris and shall ensure that no dismantled material or waste is dumped at any unauthorised location.

10.7 C&D waste shall be transported only to **designated/authorised unloading, processing or disposal facilities** approved by the competent authority.

10.8 No C&D waste shall be dumped on roads, footpaths, drains, vacant plots, water bodies or any unauthorised location.

10.9 Where applicable, the Contractor shall comply with the MCGM **"Debris on Call"** system and/or the procedure prescribed by MCGM SWM Department.

10.10 For quantities requiring a C&D Waste Management Plan/permission, the Contractor shall obtain the necessary approval/NOC from the concerned MCGM SWM authority before commencement of demolition.

11. Monitoring of Dust, Noise and Vibration

11.1 The Contractor shall arrange monitoring of:

- ambient dust/particulate pollution, wherever directed;

- noise levels at site boundary and sensitive receptors; and
- vibration/structural response of adjoining buildings wherever considered necessary by the Engineer-in-Charge/Structural Engineer.

11.2 Monitoring shall be carried out through suitable calibrated instruments and records shall be maintained at site.

11.3 In case of complaints or exceedance of permissible/approved limits, the Contractor shall immediately stop or modify the offending operation and implement additional mitigation measures as directed by the Engineer-in-Charge.

12. Protection of Trees and Environment

12.1 Existing trees, wherever present, shall be protected from damage during demolition.

12.2 No tree shall be cut, pruned or damaged without prior permission of the competent authority.

12.3 Dust, slurry, debris or demolition waste shall not be allowed to enter storm-water drains, sewer lines or natural watercourses.

12.4 Suitable arrangements shall be made to prevent contaminated water/slurry generated during demolition from entering public drains.

13. Fire and Hazardous Materials

13.1 All combustible materials, LPG/gas lines, fuel, chemicals and other hazardous materials shall be identified and removed/isolated before demolition.

13.2 Adequate fire extinguishers and fire-fighting arrangements shall be maintained throughout the work.

13.3 Hot work such as gas cutting/welding shall be carried out only under an appropriate permit-to-work system with adequate fire protection.

14. Monsoon and Adverse Weather

14.1 Demolition operations shall be suspended during conditions such as heavy rainfall, high winds, lightning or any other condition likely to endanger workers, adjoining properties or the public.

14.2 The Contractor shall ensure stability of all temporary structures, scaffolding, screens and barricades during adverse weather.

15. Daily Inspection and Safety Records

15.1 The Contractor shall conduct daily inspection of the demolition area, temporary supports, scaffolding, barricading, access arrangements and adjoining structures.

15.2 A daily demolition safety register shall be maintained containing:

- work executed;
- floor/portion demolished;
- safety inspection;
- dust-control measures;
- noise-control measures;
- debris removed;
- vehicle trips;
- accidents/incidents, if any; and
- instructions issued by the Engineer-in-Charge/Safety Officer.

15.3 Any unsafe condition noticed during demolition shall be immediately rectified before resumption of work.

16. Protection of Adjoining Structures – Instrumentation

16.1 Where the building is in close proximity to other structures, the Contractor shall, as directed, install suitable crack gauges/level markers/settlement markers or other monitoring devices on adjoining structures.

16.2 Baseline readings shall be recorded before commencement of demolition and periodic readings shall be taken during demolition.

16.3 In case of abnormal movement, settlement, cracking or vibration, demolition shall be stopped immediately and the matter shall be reported to the Engineer-in-Charge and Structural Engineer for necessary action.

17. Statutory Permissions

17.1 The Contractor shall obtain/assist in obtaining all permissions, NOCs and approvals required from MCGM, MHADA, MPCB, Traffic Police, Fire Department, utility agencies and other statutory authorities, as applicable to the work.

17.2 Compliance with statutory conditions shall be the responsibility of the Contractor and shall be included in the quoted rates unless otherwise specifically provided in the BOQ.

18. Responsibility for Damage

18.1 Any damage caused to adjoining buildings, roads, footpaths, utilities, vehicles, public property or private property due to negligence, improper sequencing, inadequate safety arrangements or non-compliance with the approved demolition methodology shall be made good by the Contractor at his own cost.

18.2 The Contractor shall indemnify the Employer against claims arising due to unsafe demolition practices, unauthorised disposal of debris, obstruction of public areas or damage to third-party property, to the extent attributable to the Contractor.

19. No Extra Payment

Unless specifically provided as separate items in the BOQ, all arrangements required for safe demolition, including barricading, scaffolding, protective screens, dust suppression, water sprinkling, debris chutes, PPE, safety supervision, traffic management, temporary supports, cleaning of adjoining areas and compliance with environmental/safety requirements shall be deemed to be included in the Contractor's quoted rates.

20. Authority of Engineer-in-Charge

The Engineer-in-Charge shall have full authority to order modification, suspension or stoppage of any demolition operation if,

in his opinion, the work is likely to endanger life, adjoining structures, public property or cause unacceptable dust, noise, vibration or environmental nuisance.

The Contractor shall immediately comply with such instructions without prejudice to the Employer's rights under the Contract.

21. Compliance with CPWD Specifications

All demolition/dismantling work shall, in addition to the above special conditions, comply with the relevant provisions of the **CPWD Specifications relating to Dismantling and Demolishing**, including systematic dismantling, reverse sequence of construction, provision of necessary propping/shoring, prevention of damage to adjoining property, minimization of dust and noise, safe lowering of dismantled material and prohibition of night demolition in inhabited areas.

ANNEXURE-VI

GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF FIRE CHECK DOORS/ STRUCTURAL GLAZING WORKS

This agreement made this..... day of ..... Two Thousand ..... between M/s ..... (hereinafter called the GUARANTOR on the one part) and the President of India (hereinafter called the Government on the other part)

WHEREAS THIS agreement is supplementary to a Contract No. ..... dated .(Hereinafter called the Contract) and made between the GUARANTOR ON THE ONE PART AND the Government on the other part whereby the contractor inter alia undertook to render the work in the said contract structurally stable, workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and guaranteed against faulty workmanship, finishing and materials for **five years** to be reckoned from the date of completion of the work under the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable and defect free for minimum period of **five years** to be reckoned from the date of completion of the work

under the contract.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-Charge will be final and binding on both the parties.

IN WITHNESS WHEREOF these presents have been executed by the obligator

..... and ..... by ..... for and on behalf of the

President of India on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:

1.

.....2.....

.....

SIGNED FOR AND BEHALF OF THE PRESIDENT OF INDIA BY

.in the presence of:

1.

.....2.....

....

ANNEXURE-VII

GUARANTEE TO BE EXECUTED BY THE CONTRACTORFOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

This agreement made this..... day of ..... Two Thousand.....

between M/s.....(hereinafter called the GUARANTOR on the one part) and the PRESIDENT OF INDIA (hereinafter called the Government on the other part)

WHEREAS THIS agreement is supplementary to a Contract No……dated

.(Hereinafter called the Contract) and made between the GUARANTOR on the one part and the Government on the other part whereby the contractor inter alia undertook to render the building and structures in the said contract completely water and leak-proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain water and leak proof, for **Ten Years** from the date of completion of the work under the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be **Ten years** to be reckoned from the date of completion of the work under the contract.

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose:

Misuse of roof shall mean any operation which will damage proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;

Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts;

The decision of the Engineer-in-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect being found render the building water proof to the satisfaction of the Engineer-in- Charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of

the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-Charge will be final and binding on both the parties.

IN WITHNESS WHEREOF these presents have been executed by the obligator

..... and ..... by ..... for and on behalf of the

PRESIDENT OF INDIA on the day, month and year first above written. SIGNED, sealed and delivered by OBLIGATOR in the presence of:

1. ..... 2. .....

SIGNED FOR AND BEHALF OF THE PRESIDENT OF INDIA BY

in the presence of:

1. ..... 2. .....

LIST OF PREFERRED MAKES FOR CIVIL WORKS

Note:

1. The contractor shall obtain prior approval from the Engineer-in-Charge before placing order for any specific material. The contractor shall make a detailed submittal with catalogues and highlighted proposed specification.

2. Wherever applicable, the Engineer-in-charge may approve any material equivalent to that specified in the tender subject to proof being produced by the Contractor for equivalence to his satisfaction

3. The Engineer-In-Charge shall verify that manufacturers must have valid IS Certification as on date for materials wherever applicable. The contractor has to comply PPP (MII) 2017, Make in India Policy.

The following brands shall be used if not otherwise mentioned in the items.

Sl. No	Material	List of Preferred Make
1.	(a) Ordinary Portland Cement	ACC, Ultratech, Ambuja Cement, J.K. Cement, Century Cement, Shree Cement.
	(b)Portland Pozzolana Cement.	ACC, Ultratech, Ambuja Cement, J.K. Cement, Century Cement, Shree Cement.
	(c) White Cement	Birla White, J. K. White, Saint Gobain (Weber), Birla White.
2.	Reinforcement Steel (TMT Bars) Low Alloy/ Corrosion Resistant Bars of Fe 550D Grades or more.	SAIL, Tata Steel, RashtriyaIspat Nigam Ltd (RINL), JSW Steel Ltd., Jindal Steel& Power Ltd.,
3.	Water Proofing Compounds, Admixtures, Plasticizer, Super Plasticizer, Curing Compounds	PIDILITE, BASF, FOSROC, SIKKA,CICO, Dr. Fixit, ASIAN LABORATORIES, MC BAUCHEMIE, ROFF, Berger Paints(I) Ltd, BIRLA Opus. Ultra Tech, STP Ltd, Birla white, Techno Nicol, MAPEI, Fosroc.
4.	Integral Water proofing compound with cement	Fosroc, Pidilite,Sika :Sikacim,& equivalent product of BASF, CICO, Asian Paints, BIRLA Opus, Birla White, Technonicol, MAPEI.

5.	Crystalline water proofing compound	Fosroc, Pidilite,Sika :Sikacim,& equivalent product of BASF, CICO, Asian Paints,Berger Paints(I) Ltd, STP Ltd, Technonicol, MAPEI.
6.	Grouts, Tile Adhesive	MYK Latecrete, BASF, Ardex Endura, Ferrous Crete, Pidilite, UltraTech, ROFF, Ultra Tech, STP Ltd, Birla White, MAPEI.
7.	Stone Adhesive	Pidilite - Fevimate excel, BASF, Ardex Endura, MYK Laticrete, ROFF, MAPEI.
8.	Injection Grouting System :- Cementitious / Resin Based /PU	PIDILITE / CICO TECHNOLOGIES / SIKA / BASF/ FOSROC / MC BAUCHEMIE (I) PVT. LTD. / ASIAN SMART CARE / MAPEI/ FERROUS CRETE
9.	Waterproofing Self-adhesive (HDPE) Membrane	PIDILITE / CICO TECHNOLOGIES / SIKA / BASF/ FOSROC / MC BAUCHEMIE (I) PVT. LTD. / MAPEI / ASIAN SMART CARE / MCON/ FERROUS CRETE.
10.	Waterproofing coatings: Single/Double Component Liquid PU Elastomeric Membrane (spray applied)	PIDILITE / CICO TECHNOLOGIES / FOSROC / SIKA / MC BAUCHEMIE (I) PVT. LTD./ ASIAN SMART CARE / MCON/ MAPEI /FERROUS CRETE
11.	Swellable Water Bar, Re-injectable Hose System.	KRYTON / CICO TECHNOLOGIES / PIDILITE/ PENETRON /FOSROC/ MAPEI / ASIAN SMART CARE / MCON/FERROUS CRETE.
12.	Integral Waterproofing Admixture for Plaster / Screed / Mortar	PIDILITE / CICO TECHNOLOGIES / FOSROC / SIKA / MC BAUCHEMIE (I) PVT. LTD./ MAPEI/ ASIAN SMART CARE / MCON/FERROUS CRETE.
13.	Expanded polystyrene sheet (EPS) and Extruded Polystyrene Insulation Board (XPS) / Dimpleboard / Drainboard.	PIDILITE / CICO TECHNOLOGIES / FOSROC / SIKA / MC BAUCHEMIE (I) PVT. LTD./ MAPEI/ ASIAN SMART CARE / FERROUS CRETE.
14.	Epoxy Coating : Food Grade Epoxy Coating for water Tanks / Non-Toxic Epoxy Coating for STP Tanks / Bituminous Epoxy Coating	PIDILITE / CICO TECHNOLOGIES / FOSROC / SIKA / MC BAUCHEMIE (I) PVT. LTD./MAPEI/ MCON / ASIAN SMART CARE / FERROUS CRETE.
15.	Moisture Resistant HDF/MDF Board	ACTIONTESA/ GREENPLY/ CENTURY/HILUX
16.	SS Mesh 316 GRADE	GKD METAL FABRICS / RAINOX / WMW

17.	Structural Steel	SAIL, Tata Steel, RashtriyaIspat Nigam Ltd (RINL), and JSW Steel Ltd., Jindal Steel & Power Ltd
18.	Polycarbonate Sheet	GE Plastic, LEXAN, Bayers, DIP, DANPALON
19.	Profile steel sheet	Ezy deck of TATA, Lloyd Superdeck, JSW/ Jindal
20.	Aluminum Sheeting	KINGSPAN, ALUFORM, BEMO
21.	Sandwich Profile panel	Kingspan, Lloyd, Metclo (Note: Profile steel sheet should be of make Tata/Jindal/JSW).
22.	Particle Board	Action TESA, Merino, Century, Greenply, Euro, Anchor.
23.	Laminates	Greenlam, Century Ply, Merino, Sunmica
24.	Flush door shutters	Centuryply, Kitply , Durian, Green ply, Godrej, Anchor, Kalpataru,
25.	Fire Rated Doors	Kutty, Sreeji, woodcraft, assa abloy, Tata Pravesh, Kitply, Greenply, Sylvan ply. Signum, Shakti Horman, Tufwood, Navair, PACIFIC, Bhawani Fire.
26.	False Ceiling System	Armstrong, Hunter Douglas, USG Boral, Saint Gobain, Aerolite, Durlum, Anutone, Hilux
27.	Plywood/ Veneer	Green ply, Century, Merino, Duro, Durian, Anchor, Kalpataru, Euro
28.	All Types of Ply boards	MERINO / GREENPLY/ CENTURY/ KALPTARU
29.	Melamine Polish	Asian Paints Melamine Gold, Wudfin of Pidilite, Timbertone of ICI Dulux.
30.	Floor Spring & Door Closure	Godrej, Dorma, Dorset, Hafele, Ozone, PAG
31.	Metal False Ceiling	KNAUF / HUNTERDOUGLAS / SAINT GOBAIN / DEXUNE / MCRA/ HI- STEEL
32.	Gypsum Board / Glass Reinforced Gypsum Tile for False Ceiling.	SAINT GOBAIN / KNAUF / USG BORAL / INDIA GYPSUM / HILUX/GYPROC
33.	Moisture Resistant Calcium silicate ceiling tiles/ Board.	GYPROC / AEROLITE / USG BORAL / HILUX / KNAUF / EVEREST.
34.	Aluminum Section	Hindalco, Jindal, Indian Aluminum co., Nalco
35.	Glass / Rock wool Insulation	UP TWIGA / VETROTEX / ROCK WOOL I. LTD / L LLOYDS

36.	Cement Fiber board	AMF/USGBORAL/LAFARGE/INDIAGYPSUM / CENTURY / NCL (BISON)
37.	Anodised Aluminum Hardware (Heavy Duty)	Kilong, Alualpha, Classic, Ebco
38.	Aluminum Structural Members – Sliding Doors/Windows, Glazing and Partitions Deluxe/Domal series	JINDAL/HINDALCO/NALCO/INDALCO
39.	Clear/Float/Frosted/Toughen Glass/ Refractive Glass/ laminated glass	Saint Gobain, Modiguard, Asahi Glass, EMIRATES GLASS, GUARDIAN GLASS (SUNGUARD), FG GLASS, PILKINGTON.
40.	Modular Stainless-Steel Railing, Accessories etc.	Dormakaba, Hafele, Ozone, GEZE, Godrej
41.	S.S. Door & window hardware fittings and fixtures	Dorma, Hafele, Dorset, Godrej, Ozone, PAG, Hettich
42.	Silicon based water repellant /Weather Sealant	G.E. Plastics, Dow Corning, Wacker, BASF, Pidilite, Nerolac- Perma, STP Ltd, MAPEI.
43.	Poly-Sulphide Sealant	Fosroc, Pidilite, Sika, BASF, Nerolac-Perma, MAPEI.
44.	Mosaic tiles / Chequered Tiles	Ultra Tiles, NITCO, Hyper(Mayur), Pavcon, AGL
45.	Ceramic Tiles	Somany, RAK, AGL, Vermora, Nexion, Simpolo, KAJARIA, JOHNSON
46.	Vitrified Tiles (Satin/Matt/Glazed finish/Double charged)	Somany, RAK, AGL, KAJARIA, JOHNSON.
47.	GRC Jaali	KERAKROME, Unistone, Birla, Dalal,Shenisha, MS ENGINEERS, Lonex engineering co.
48.	Paver block & Kerb Stone	BASANT BETONS, SUPER, HINDUSTAN VED PMC,NITCO, JOHNSON, PAVIT
49.	Re-barring Chemical/Mechanical Dash / Anchoring Fasteners	3M INDIA, HILTI, Fischer, Bosch, Wurthindia.
50.	Cement Based Wall putty	Birla wall care, JK White, Berger, Asian Paints, JSW Paints, Birla White.
51.	Oil Bound Washable Distemper / Dry Distemper	Asian Paints, Nerolac, Berger, Dulux ICI, JSW Paints, BIRLA Opus, Birla White.
52.	1st Quality Acrylic Distemper (washable/Ready mix/ Low VOC)	Asian Paints: Tractor Aqua Lock Paint, Berger: Commando or equivalent paints of Nerolac or ICI- Dulax. BIRLA Opus, Birla White.
53.	Acrylic Emulsion Paints	Asian Paints, Nerolac , Berger , ICI-Dulux :JSW Paints, BIRLA Opus,

54.	Plastic Emulsion Paint	Asian Paints: Apcolite Heavy Duty Premium Emulsion Paint,
		Nerolac: Impression, Berger: Easy Clean, ICI-Dulux: 3 in 1, JSW
55.	Premium Acrylic Emulsion Paints (Interior)	Asian Paints: Royale Luxury Emulsion, Nerolac: Impression,
		Berger: Silica Dulux: Velvet touch BIRLA Opus.
56.	Textured Exterior Paint	Asian paints, Nerolac,Berger Paints, Ultratech textured Paints, Luxture, Pidilite, JSW Paints, BIRLA Opus, , Birla White.
57.	Exterior Grade water proofing paint	Asian Paints/ Dr. Fixit/ Berger/ Dulux/ Nerolac,
58.	Acrylic Smooth Exterior Paint	Asian Paints: Apex/ Professional Premium Exterior Emulsion, Nerolac: XL, Berger: Weather Coat, ICI-Dulux: Weather Shield, / Dr. Fixit
59.	Premium Acrylic Smooth Exterior Paint with Silicon additive.	Asian Paints: Apex Ultima Nerolac: XL Total
		Berger: Weather Coat all guard ICI-Dulux: Weather Shield max
60.	Synthetic Enamel Paint	Asian:Apcolite Premium gloss enamel, Nerolac: Synthetic Hi gloss
		Berger:Luxol Hi gloss
		ICI -Dulux: Gloss Synthetic enamel, JSW Paints, BIRLA Opus.
61.	Cement Primer	Nerolac, BP White(Berger),
		Decoprime WT (Asian), White primer (ICI), JSW Paints, BIRLA Opus, Birla White.
62.	Steel Primer(Red Oxide Zinc Chromate Primer)	Asian Paints, Nerolac, Berger, ICI, JSW Paints
63.	Wood Primer	Asian Paints (Wood Primer - White/Pink), Berger ICI, Nerolac,JSW Paints.
64.	Epoxy Paint	Asian, Nerolac, Berger, ICI, Kansai Akzo Nobel
65.	Fire Paint	Caboline, Akzo Nobel Coatings India Ltd., PROMAT, Jotun, Asian Paints, Berger, JSW
66.	Welding Electrodes	ADVANI-OERLIKON/MODI
67.	G.I. / M.S. Pipe	Tata, Jindal (Hisar), Prakash, Surya
68.	G.I. Fittings	Unik, AVR, Zoloto, R-brand
69.	HDPE Pipes	Reliance, JainPipes, ORIPLAST, Supreme, Finolex
70.	Grease Separator	Aco, Kessel, Ashirvad, Texol

71.	DI PIPES	Electrosteel, Jindal, TATA DUCTURA,
72.	DI Fittings	Electrosteel, Jindal, TATA DUCTURA,
73.	UPVC pipe and Fittings	Astral, Supreme, Ashirwad, Finolex, Prince.
74.	Centrifugally Cast (spun) Iron Pipes & Fittings	NECO, Kapilansh, SKF, RPMF, Hepco.
75.	C.I. Manhole covers, frames & GI Gratings	NECO, RAJ Iron Foundary Agra, BIC, Kapilansh RPMF, Hepco
76.	SFRC Manhole covers & gratings	KK, JAIN, PARGATI
77.	CP Brass Fittings (Premium range)	Kohler, Jaquar, Grohe /ROCA
78.	CP Brass Fittings (Automation)	JAQUAR/KOHLER/ GROHE/ROCA
79.	Sanitary ware, Fittings & accessories	JAQUAR/KOHLER/ GROHE/Hindware/Cera
80.	Glazing Structural/ Suspended / Skylight/ clear/ float/ frosted Mirror Glass	SAINT GOBAIN / PILKINGTON / AGC GLAVERBEL / AIS Modi Guard, Asahi
81.	Toughened Glass / Hermetically sealed glass / High Performance Glass	SAINT GOBAIN / PILKINGTON / AGC GLAVERBEL / AIS.
82.	CPVC Pipe & fitting	Astral, Supreme, Finolex, Prince,
83.	Non-Return Valve (Check valve) and other kind of Valves	ZOLOTO/SANT/LEADER
84.	Water Meter	PRIMA/ ZOLOTO/LEADER/ CAPSTAN
85.	Brass Stop & Bib Cock	ZOLOTO/ SANT/L&K/LEADER/ASTRAL
86.	Gun Metal Valves, Globes	ZOLOTO/ SANT/ LEADER
87.	Stainless Steel Sink	Neelkanth, Nirali, Hafele, Futura
88.	RCC Pipes (NP-2, NP-3,NP-4)	JAIN SPUN PIPE, K. K. SPUN PIPE, THE INDIANHUME PIPE CO. LTD., PATEL HUME PIPES.
89.	Gypsum Plaster	Ferrous Crete, Gyproc Saint Gobain, Boral, UltraTech-Birla white, JK lakshmi, Birla White.
90.	Saucer Drain	KK Concrete, ACME, Advanced Precast, Super
91.	Nuts/Bolts & Screws (SS OR GI)	HILTI /ATUL/ WURTHINDIA/FISCHER
92.	Clamp system for dry stone cladding	HILTI / FISCHER/BOSCH/ WURTH INDIA
93.	Epoxy Mortar, Epoxy Based Resin Anchor System, Floor Hardener	Ironite, Ferrok, Hardonate, Fosrock, STP Ltd, MAPEI. PIDILITE / CICO TECHNOLOGIES / FOSROC / SIKA / MC BAUCHEMIE (I) PVT. LTD./BOSTIK / MCON/ ASIAN SMART CARE / FERROUS CRETE
94.	Modular Expansion Joint	Herculus, Sanfield India Ltd.Vexcolt, Tristar

95.	WPC Door / CNC Jali	KAKA / RAJSHRI / ECOSTA/DURIAN CENTURY PLY
96.	Cement Fiber Board	LAFARGE/INDIAGYPSUM/CENTURY/NCL (BISON) / EVEREST
97.	UPVC doors and window	NCLVEKA/DUROPLAST /LG-HAUSYS/ KOMMERLING / MARG / FENESTA/ALUCRAFT/RAJSHRI PLASTIWOOD Rotto, Dorset, Kinlong, Fenesta, Aluplast, Rajshri, Aparna.
98.	UPVC doors and window hardware	Rotto, Dorset, Kinlong, Fenesta, Duroplast, Rajshri, Aparna, Saint Gobain.
99.	Window Blinds	VISTA/ DECK/HUNTER /VISTA /MAC/ MARVEL
100.	Modular SS Grade316 Curtain Rods and Accessories	JINDAL/HAFELE/GEZE/Q-RAILING/ MARK / TRESA
101.	READY MIX CONCRETE (In case of Batch Mix plant not installed at site)	A.C.C., ULTRA TECH, PRISM JOHNSON RMC, GODREJ, JSW, NUVOCO (LAFARGE),
102.	CONCRETE BLOCKS.	CONWOOD, GURJARI, HINDUSTAN, LOK GROUP,SAI BLOCK, VED PMC LTD
103.	AAC BLOCKS	AEROCON, SIPOREX, ULTRA TECH, ECOLITE, GODREJ, HLL BIRLA AEROCON / TATA TISCOBUILD, J K LAKSHMI, SIPOREX, FERROUS CRETE.
104.	AAC BLOCKS Adhesive	HLL BIRLA AEROCON / ULTRATECH, ARDEXENDURA, MYK LATICRETE, FERROUS CRETE, MAPEI, FIXOBLOCK XTRALITE FROM ULTRATECH, SMARTFIX FROM AEROCON.
105.	MECHANICAL SPLICING SYSTEM WITHCOUPLER	SPLICETEK INDIA, DEXTRA INDIA ISHITA ENTERPRISES, SPLICEMAN G-TECH, SNTP & SANFIELD
106.	HARDWARE FOR FIRE RATED DOORS	DORMA, INGERSOLL RAND, BECKER- FS, OZONE,GEZE, ASSA ABLOY, HAFFLE
107.	STAINLESS STEEL Grade 304/316	JINDAL, SAIL, SALEM STEEL
108.	READY MIXED CEMENT PLASTER	WALPLAST, ULTRA TECH, MADRAS CEMENT LTD,SOUND BUILD CARE LTD, SAINT GOBAIN(WEBER), ACC,

109.	ACRYLIC TEXTURE PLASTER	ASIAN PAINTS, SPECTRUM PAINTS, HERITAGE,DULUX, BERGER , PIDILITE ,PAINTS,NEROLAC, ULTRATECH,
110.	VINYL FLOORING	RESPONSIVE, TARKETT, POLYFLOR, GRABO GERFLOOR, EBCO, AMSTRONG, MONDO
111.	GYPSUM BOARD	GYPROC, ARMSTRONG, SAINT GOBAIN, Hi-STEEL
112.	CALCIUM SILICATE BOARD	STARPAN, HILUX, AEROLITE, PROMAT, VISHAKHA,
113.	S. S. GRATINGS/ Cockroach Jali	CHILLY, CAMRY, KICH, VIKING
114.	EPDM	AMEE RUBBER INDUSTRIES PVT. LTD, BOHRARUBBER
115.	SPACER TAPE / BACKER ROD	NORTON, BOW
116.	FRICTION HINGES AND LOCKS	OZONE, GEZE, DORMA, ASSA ABLOY, HAFFLE, STARLOCK, GODREJ
117.	ALUMINIUM COMPOSITE PANEL	ALUDECOR, EUROBOND, ALSTRONG, ALUCOBOND
118.	FROSTED GLASS FILM	GARWARE, LLUMAR, LG, 3M
119.	ROLLING SHUTTERS AND GRILLLS	Standard, Swastik, Shubdhwar, Bhawani Fire
120.	WOODEN FLOORING	KRONOSWISS, PERGO, HARO, PARADOR, BALTERIO
121.	Urinal Frosted Glass Partition-12mm thick toughened	JAQUAR /GEREENLAM/ MERINO/ FUNDERMAX/
122.	Automatic Meter Reading System (Electromagnetic)	SENSUS /XYLEM /HONEYWELL / ITRON
123.	Automatic Meter System Reading (Ultrasonic)	PELTEK / AVVA / DIEH AXIOMA/ BAYLAN/ GLOBAL
124.	Aluminium Formwork	KUN- KANG, VABA, MIVAN, S-Form, MFS, MAIONI, ALFK
125.	Shower enclosure	Jaquar/ Kohler/ GROHE
126.	Cubicles	Century/ Jaqaur/ Greenlam
127.	Anti-Termite Pesticides-(Chlorpyriphos)	DE-Nocil,Bayer, Biflex-TC from FMC, Hilban from HIL.
128.	Expansion Filler Board	3M, Asian Paint, Pidilite,Shalitex-STP
129.	Floor Springs	GEZE, HAFFLE, ASSA ABLOY (YALE)
130.	Expansion Joint System	3M, 3R, Kantaflex, sandfield, Deevin,

Note-

(1) The above makes are subjected to the compliance of Make in India norms.

(2) In case approved make for any material/ item is not specified in the NIT, the contractor has to obtain approval of make for that particular item by competent authority after recommendation of Engineer in charge before execution at site.;

(3) In case of non- availability of a particular material / item from specified make, the contractor has to obtain approval of make for that particular item by competent authority after recommendation of Engineer in charge before execution at site.

SCHEDULE OF QUANTITIES (CIVIL)

Name of Work :- Construction of 58 nos.Type -III & 30 nos. Type-IV Residential Quarters and 28 nos. Transit Accommodation including all internal & external Civil, Electrical & Mechanical Services, Development Works etc. for SIB at Mahim, Mumbai

Item no.	Description of Items	Qty	Unit	Rate	Amount
	Part A- Cosultancy work				
1	**Cosultancy work**				
1.1	Providing Comprehensive Architectural & Engineering Consultancy Services for Construction of Residential Quarters & Guest Rooms for SIB at Mahim, including project conceptualization, master planning, architectural, structural, civil, electrical/MEP and Public Health Engineering services, topographical survey and soil investigation, external development and landscaping, BIM Modelling , preparation of GFC/shop drawings, proof checking/vetting, obtaining all necessary statutory approvals/clearances including permission for dismantling/demolition of existing structures, EIA/Environmental Clearance, Fire NOC/Fire approvals and other approvals from MCGM/BMC, AAI, Tree Authority, Pollution Control Board and other concerned authorities, obtaining Commencement Certificate (CC), Completion/Occupation Certificate and other statutory permissions, preparation of as-built drawings/model and providing consultancy services up to completion of the project, complete as per Scope of Work and directions of the Engineer-in-Charge.	**1**	**Job**	**14861280**	14861280
	Total				**14861280**
	Part B - Civil Construction work				
1	**EARTH WORK**				
1.1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth, lead upto 50m and lift upto 1.5m, as directed by engineer-in-charge.				
1.1.1	All kinds of soil	8370	cum	202.07	1691326
1.2	Earth work in excavation by mechanical means (Hydraulic Excavator)/ manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
1.2.1	All kinds of soil.	350	cum	296.33	103716
1.3	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
1.3.1	All kinds of soil				

1.3.1.1	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	170	metre	400.89	68151
1.4	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	840	cum	223.13	187429
1.5	Extra for every additional lift of 1.5 m or part thereof in excavation/ banking excavated or stacked materials.				
1.5.1	All kinds of soil.	10040	cum	144.35	1449274
1.6	Supplying and filling in plinth with local sand under floors including, watering, ramming consolidating and dressing complete.	70	cum	2417.7	169239
1.7	Carriage of Excavated Earth by Mechanical transport including loading, unloading and stacking to approved municipal dumping point or as approved by Engineer in charge, beyond initial lead of 50m and including all lead and lift.(Royality shall be paid by contractor.Nothing extra shall be paid for this)	7700	cum	562.49	4331173
	SUB HEAD TOTAL=				**8000308**
2	**CONCRETE WORK**				
2.1	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - All work upto plinth level :				
2.1.1	1:5:10 (1 Cement : 5 coarse sand (Zone-III) : 10 graded stone aggregate 40 mm nominal size).	15	cum	7420.84	111313
2.2	Providing and fixing up to floor five level precast cement concrete solid block including hoisting and setting in position with cement mortar 1:3 (1 cement : 3 coarse sand), cost of required centering, shuttering complete :				
2.2.1	1:1½:3 (1 Cement : 1½ coarse sand (zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources).	46	cum	20365.3	936804
2.3	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand(Zone III) : 4 graded stone aggregate 12.5mm nominal size).	58	sqm	467.72	27128
2.4	Extra for providing and mixing water proofing material in cement concrete work @ 1 kg per 50kg of cement.	10	per bag of 50 kg of cement	20.66	207
2.5	Providing and applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7kg per square metre on damp proof course after cleaning the surface with brushes and finally with apiece of cloth lightly soaked in kerosene oil.	58	sqm	166.38	9650

2.6	Providing and laying in position ready mixed or site batched design mix cement concrete for plain cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, using Ordinary Portland/ with fly ash, admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering and finishing as per direction of the Engineer-in-charge; for the following grades of concrete.				
	Note : Extra cement upto 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the minimum specified cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
2.6.1	All works up to plinth level:				
2.6.1.1	Concrete of M-15 grade with minimum cement content of 240 kg/cum.	170	Cum	10229.92	1739086
					2824188
3	**REINFORCED CEMENT CONCRETE**				
3.1	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases upto floor five level excluding the cost of centring, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand (Zone-III) : 3 graded stone aggregate 20 mm nominal size).	300	cum	13097.98	3929394
3.2	Centring and shuttering including strutting, propping etc. and removal of form for :				
3.2.1	Foundations, footings, bases of columns, etc. for mass concrete.	230	sqm	446.43	102679
3.2.2	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	20300	sqm	959.11	19469933
3.2.3	Suspended floors, roofs, landings, balconies and access platform.	18040	sqm	1055.59	19042844
3.2.4	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	16800	sqm	838.33	14083944
3.2.5	Columns, Pillars, Piers, Abutments, Posts and Struts.	3550	sqm	1094.35	3884943
3.2.6	Stairs, (excluding landings) except spiral-staircases.	933	sqm	870.83	812484
3.2.7	Vertical and horizontal fins individually or forming box louvers band, facias and eaves boards	200	sqm	1476.18	295236
3.2.8	Small lintels not exceeding 1.5 m clear span, moulding as in cornices, window sills, string courses, bands, copings, bed plates, anchor blocks and the like	892	sqm	446.43	398216
3.2.9	Cornices and mouldings	500	sqm	975.39	487695
3.2.10	Weather shade, Chajjas, corbels etc., including edges	1654	sqm	1082.74	1790852
3.3	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				
3.3.1	Thermo-Mechanically Treated bars of grade Fe-500D CRS or more.	459202	kg	122.78	56380822

3.4	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.				
3.4.1	Thermo-Mechanically Treated bars of grade Fe-500D CRS or more.	1430380	kg	122.78	175622056
3.5	Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.	500	metre	89.25	44625
3.6	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, using Ordinary Portland cement with fly ash, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge, for the following grades of concrete.: Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
3.6.1	All works upto plinth level				
3.6.1.1	Concrete of M40 grade with minimum Ordinary Portland cement content of 390 kg /cum	2552	Cum	11335.89	28929191
3.6.2	All works above plinth level upto floor V level				
3.6.2.1	Concrete of M40 grade with minimum Ordinary cement content of 390 kg /cum	10217	Cum	11740.76	119955345
3.7	Extra for R.C.C. / B.M.C. / R.M.C. work above floor V level for each four floors or part thereof	15027	cum	404.88	6084132

3.8	Providing and fixing of expansion joint system related with floor location as per drawings and direction of Engineer-In-Charge. The joints system will be of extruded aluminum base members, self aligning / self centering arrangement and support plates etc. as per ASTM B221-02. The system shall be such that it provides floor to floor /floor to wall expansion control system for various vertical localtion in load application areas that accommodates multi directional seismic movement without stress to it's components. System shall consist of metal profiles with an universal aluminum base member designed to accommodate various project conditions and finish floor treatments. The cover plate shall be designed of width and thickness required to satisfy projects movement and loading requirements and secured to base members by utilizing manufacturer's pre-engineered self-centering arrangement that freely rotates / moves in all directions. The Self - centering arrangement shall exhibit circular sphere ends that lock and slide inside the corresponding aluminum extrusion cavity to allow freedom of movement and flexure in all directions including vertical displacement. Provision of Moisture Barrier Membrane in the Joint System to have watertight joint is mandatory requirement all as per the manufactures design and as approved by Engineer - inCharge. (Material shall conform to ASTM 6063).				
3.8.1	Floor Joint of 150 mm gap	70	metre	8893.66	622556
3.9	Providing and fixing of expansion joint system related with wall joint (internal/external) location as per drawings and direction of Engineer-InCharge. The joints shall be of extruded aluminum base members, self aligning / centering arrangement and support plates as per ASTM B221- 02. The material shall be such that it provides an Expansion Joints System suitable for vertical wall to wall/ wall to corner application, both new and existing construction in office Buildings & complexes with no slipping down tendency amongst the components of the Joint System. The Joint System shall utilize light weight aluminum profiles exhibiting minimal exposed aluminum surfaces mechanically snap locking the multicellular to facilitate movement. (Material shall conform to ASTM 6063).				
3.9.1	Wall Joint of 150 mm gap	135	metre	6809.29	919254

3.10	Providing and fixing of expansion joint system of approved make and manufactures for various roof locations as per approved drawings and direction of Engineer-In-Charge. The joints shall be of extruded aluminum base members with, self aligning and self centering arragement support plates as per ASTM B221-02. The system shall be such that it provides watertight roof to roof/roof to corner joint cover expansion control system that is capable of accommodating multidirectional seismic movement without stress to its components. System shall consist of metal profile that incorporates an universal aluminum base member designed to accommodate various project conditions and roof treatments. The cover plate shall be designed of width and thickness required to satisfy movement and loading requirements and secured to base members by utilizing manufacturer's pre-engineered self-centering arrangement that freely rotates / moves in all directions. The Self centering arrangement shall exhibit circular sphere ends that lock and slide inside the corresponding aluminum extrusion cavity to allow freedom of movement and flexure in all directions including vertical displacement. The Joint System shall resists damage or deterioration from the impact of falling ice, exposure to UV, airborne contaminants and occasional foot traffic from maintenance personnel. Provision of Moisture Barrier Membrane in the Joint System to have water tight joint is mandatory requirement. (Material shall conform to ASTM 6063).				
3.10.1	Roof Joint of 150 mm gap	21	metre	7627.18	160171
	SUB HEAD TOTAL=				**453016372**
4	**Masonry Work**				
4.1	Extra for brick work / AAC block masonry / Tile brick masonry/ fly ash bricks masonry insuperstructure above floor V level, for each four floors or part thereof by mechanical means.	5873	cum	192.9	1132902
4.2	Providing and laying autoclaved aerated cement blocks masonry with 150mm/230mm/300 mm thick AAC blocks in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made for seperately).	2373	cum	9487.11	22512912
	SUB HEAD TOTAL=				**23645814**
5	**Cladding Work**				
5.1	Providing and fixing 18mm thick gang saw cut mirror polished premoulded and prepolished) machine cut for kitchen platforms, vanity counters, window sills ,soffit,jam/reveal, facias and similar locations of required size, approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.				
5.1.2	Granite of any colour and shade				

5.1.2.1	Area of slab of any size	756	sqm	5847.22	4420498
5.2	Providing edge moulding to 18 mm thick marble stone counters, Vanities etc., including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.				
5.2.1	Granite work	1468	metre	581.67	853892
5.3	Extra for providing opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	236	each	1114.16	262942
5.4	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of minimum 300 mmx600 mm size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	4620	Sqm	1443.45	6668739
5.5	Providing and forming a 10 mm wide and 5 mm deep V-shaped groove along the joints (5 mm each side) of 18 mm thick granite stones fixed as wall lining, including cutting, shaping, edge profiling and machine polishing of the exposed edges to achieve a smooth, high-gloss finish, complete in all respects as per the approved design, specifications and directions of the Engineer-in-Charge.	720	metre	158.95	114444
5.6	Providing and fixing 50 mm wide, 3M make self-adhesive anti-skid safety strips on stair treads, including cleaning and preparation of the surface, proper alignment, application and pressing of the strips to ensure firm adhesion, complete in all respects as per the manufacturer's specifications and the directions of the Engineer-in-Charge.	1520	metre	133.47	202874
5.7	Providing and fixing sandwich-type Kota stone supports, comprising 25 mm thick Kota stone on each side, in a single unit, with exposed surfaces polished, bonded with cement-based, high-polymer-modified, quick-setting, water-based tile adhesive conforming to IS 15477, in an average 6 mm thick layer, for horizontal and vertical support to kitchen platforms, including making chases in walls and making good the same with cement mortar 1:3 (1 cement : 3 fine sand), complete in all respects as per the approved design, specifications and directions of the Engineer-in-Charge.The sandwich-type Kota stone support unit shall be measured as a single unit, without separate measurement of the individual Kota stone layers, for payment.	200	sqm	3578.02	715604

5.8	Providing and fixing sandwich-type kitchen platform comprising 18 mm thick black granite slab with mirror-polished top surface and 25 mm thick Kota stone slab as the bottom layer, bonded together with cement-based, high-polymer-modified, quick-setting, water-based tile adhesive conforming to IS 15477, in an average 6 mm thick layer, including making necessary chases in walls, fixing the platform in position, filling and finishing joints with cement slurry admixed with matching pigment, making good the chased portions and completing all incidental works, complete in all respects as per the approved design, specifications and directions of the Engineer-in-Charge. The sandwich-type kitchen platform shall be measured as a single composite unit based on its finished plan area. The top granite slab and bottom Kota stone slab shall not be measured separately for payment.	201	sqm	5824.20	1170664
5.9	Stone tile work for wall lining upto 10 m height with special adhesive over 12mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement with an admixture of pigment to match the stone shade. 18 mm thick Polished Granite stone slab jet Black, Cherry Red, Elite Brown, Cat Providing and fixing 18 mm thick polished granite stone slabs of Jet Black, Cherry Red, Elite Brown, Cat Eye, Indian Lakha Red or equivalent approved shade, for wall lining up to 10 m height, laid over a 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and fixed with cement-based, high-polymer-modified, quick-setting, water-based tile adhesive conforming to IS 15477, Type-III , including cutting, dressing, levelling, alignment, making necessary adjustments at corners and edges, and pointing the joints with white cement mixed with pigment to match the shade of the stone, complete in all respects as per the approved drawings, specifications and directions of the Engineer-in-Charge.	1110	sqm	5293.66	5875963
	SUB HEAD TOTAL=				**20285620**
6	**WOOD AND P. V. C. WORK**				
6.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately).				
6.1.1	Second class teak wood	43	cum	162735.4	6997621
6.2	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:				
6.2.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	1523	sqm	2723.82	4148378
6.3	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete.				
6.3.1	Fixed to steel windows by welding	12205	kg	249.43	3044293

6.4	Providing & Fixing decorative high pressure laminated sheet of plain / wood grain in gloss / matt / suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S, including cost of adhesive of approved quality.				
6.4.1	1.0 mm thick.	3046	Sqm	1021.5	3111489
6.5	Providing and fixing factory-made, ISI-marked, un-insulated metal fire-rated doorset assembly for non-egress applications, such as shafts and similar areas, comprising a galvanized steel frame and single-leaf shutter, including all necessary hardware and accessories, conforming to FD 120 UD classification of IS 3614:2021, with fire-resistance performance of 120 minutes for integrity. The complete doorset assembly shall be tested in the unlatched condition in accordance with IS 17518 (Part 1):2022.Frame: The door frame and shutter shall be fabricated from galvanized iron (GI) steel sheet of minimum 1.20 mm thickness with minimum zinc coating of 120 GSM, conforming to IS 277. The frame shall be of minimum size 90 mm × 60 mm, with a grooved profile to accommodate the specified seal, mitred joints and self-tab/screw-assembled construction for site assembly. Suitable reinforcement shall be provided for hardware fixing and flush installation, conforming to IS 4351. EPDM smoke seals of minimum size 10 mm × 4 mm, tested in accordance with ASTM E84, shall be fixed in the integral grooves or bonded with suitable adhesive continuously along the entire perimeter of the frame. The frame shall be secured to the masonry opening on all four sides using countersunk (CSK), hex-headed fasteners of minimum 8 mm diameter and 80 mm length, with 8 mm diameter polyamide sleeves, providing four fasteners on each vertical side for openings up to 2100 mm height and two fasteners each on the top and bottom sides.				
	Door shutter: The double-skin, single-leaf shutter shall be of minimum 46 mm thickness, box-type construction, with slots and punched holes for hardware fixing and stiffeners conforming to IS 16074. The shutter shall incorporate resin-bonded honeycomb paper core infill material of density 5 kg/m³. The shutter shall be mounted on the frame using SS 304 grade ball-bearing butt hinges conforming to EN 1935:2002 or butt hinges conforming to IS 12817, of minimum size 100 mm × 75 mm × 3 mm, with at least four hinges for doors up to 2100 mm/2400 mm height, or the number established by the test evidence, whichever is greater. The hinges shall be fixed using M6 × 25 mm screws. The shutter shall be factory-prepared for receiving the specified hardware, with adequate reinforcement for all hardware accessories.				

	Hardware and accessories: The doorset shall be provided with one fire-rated SS 304 shaft mortice deadlock with a backset of 50–80 mm, minimum 20 mm square forend, Allen-key-operated mechanism and SS 304 dead strike plate, conforming to IS 16015:2022/EN 12209, as applicable; and one recessed flush pull handle of SS 304, minimum size 40 mm × 120 mm, as approved by the Engineer-in-Charge.Finishing: The door frame and shutter shall be factory-finished with polyester powder coating of minimum 50 microns thickness, in the approved colour and shade. The coating shall have passed the salt spray test in accordance with IS 13871. The finish shall be uniform and free from visible defects, complete as per the manufacturer's specifications and directions of the Engineer-in-Charge.Installation: The hollow spaces within the door frame shall be filled/injected with fire-rated, self-extinguishing polyurethane foam (PUF) after installation at site. The rate shall include the complete fire-rated doorset assembly, supply, installation, hardware, accessories, fixing, sealing and all incidental works, complete as per the approved manufacturer's specifications and directions of the Engineer-in-Charge.				
6.5.1	Single leaf un-insulated metal fire rated door and frame of FD 120 UD with 120 minutes integrity only as per IS 3614;2021 .(For non egress application like area shafts etc.)	126	sqm	13177.27	1660336
6.6	Providing and fixing factory made ISI marked un-insulated metal fare rated doorset assembly, for all egress applications areas like utility rooms and service areas etc, consisting of galvanized i.on steel frame and single leaf shutter including necessary hardware accessories conforming to FD 120 UD classification of IS: 3614:202'1 with fire rating of 120 minutes integrity. The door frame and shutter shall be made out of minimum 1.20 mm thick GI Sheet with minimum 120 GSM Zinc coating as per IS: 277. The entire fire rated doorset assembly shall be tested in unlatched condition as per IS 17518 (Part 1):2022 Frame : The frame shall be of minimum size 90 x 60 mm with grooved profile to take appropriate fire rated smoke seal, havrng mitred cut joints (self tab/screwed assembled at sate) and provided with appropriate reinforcement suitable for taking hardware and flush fixing as per IS: 4351. The smoke sealmaterjal shall be of EPDM tested in accordance with ASTM E 84 of minimum 10 x 4 mm, fixed within the inbuilt groove or stuck with adhesive on the entire perimeter of the frame. The door frame shall be fixed in all three sides to masonry wall opening with CCSK/hex-headed fasteners of minimum 8 mm diamete size and minimum 80 mm long with 8mm dia polyamide sleeves @ 5 numbers at each on vertical side and 2 numbers on top side				

	Door shutter: The double skinned single leaf door shutters shall be consisting of minimum 46 mm thick and having box like structure, slots cut and holes punched, for fixing of hardwares with stiffners as per lS: 16074 including resin bonded honey comb paper core infill material of density 5 kg/cum. Door leaf shall be provided with vision panel, having maximum area of 0.12 sqm, of 120 minute fire rated minimum 5 mm thick clear borosilicate glass pane fixed with clip-on anangement and fire rated ceramic tape having minimum size 13x2 mm to be fixed all around the glass on both the sides. The door shutter shall be mounted on the frame with SS 304 grade ball bearing butt hinges as per EN '1935 : 2002 or butt hinges as per lS 12817, of minimum size '100x75x3 mm @ 5 numbers hinges upto 2400mm height or as per test evidence, whichever is more, fixed with M6 25 screws. All doors shall be tactory prepared for receiving appropriate hardware and provided with necessary reinforcement for hardware accessones.				
	Accessories Hardware : Fire doorset shall be provided with one number fire rated SS 304 grade mortise dead lock, 50-80 mm backset with minimum 20 mm square forend with allen key including Escutcheon of stainless steel (SS304) with 6570 mm cylinder both side key conforming to EN:12209/lS 16015:2022, one pat ot Dtypepull handle of stainless steel (SS304) of minimum 22mm dia centre to centre distance of 300 mm back to back fixing with spindle, one number 120 minutes fire rated surface mounted heavy duty door closer of size EN 3-5 wjth standard arm of desired finish conforming to lS: 35&/ENl 154 Finishing: Both frame and door shutters shall be factory linished with polyester powder coating of minimum 50 microns thick and shall have passed salt spray test as per ls:13871 of app.oved colour and shade all complete as per manufacture/s specifications and as per direction of the Engineer-in-charge. lnstallation: The hollow space in the door frame shall be filled / injected with fire rated self extinguishing type polyurethane foam (PUF) after installation at site of work. The rate shall be inclusive of complete fire rated door assembly, supply and installation by the approved manufacturer.				
6.6.1	Sangle leaf un-insulated metalfire rated doocet of FD 120 UO classification with 120 minutes integrity as per lS 3614:2021.(For egress applacations like utility room and service area etc.)	10	sqm	17381.3	173813

6.7	Providing and fixing factory made ISI marked partially insulated metal fire rated doorset assembly, for staircase / exit pathway and refuge area applications, consisting of galvanized iron steel frame and single leaf shutter including necessary hardware accessones, conforming to FD 120 Pl classification of lS 36'14 12021 with fire rating of 120 minutes integrity and 30 minutes insulation. The door frame and shutter shall be made out of minimum 1 .20 mm thick Gl Sheet with minimum 120 GSM zinc coating as per IS 277. The entire fire rated doorset assembly shall be tested in latched condition as per lS 17518 (Pan -1): 2022 Frame: The farme shall be of minimum size g0 x 60 mm with grooved profile to take appropriate fire rated smoke seal, having mitred cut joint (self tab/screwed assembled at site) and provided with appropriate reinforcement suitable for taking hardware and flush fixing as per lS 4351. The smoke seal material shall be of EPDM tested in accordane with ASTM E-84 ol minimum size 'lox 4mm, lixed within the inbuilt groove or stuck with adhesive on the entire perimeter of the frame. The door frame shall be fixed to the three sides to masonary wall opening with CSK/Hex headed fastner of minimum 8 mm dia size and minimum 80mm long with 8mm dia Polyamide sleeves @ 5 numbers at each on vertical sides and 2 numbers on horizontal top srde.				
	Door shutter. The double skinned single leaf partially insulated fire rated door shutters shall be consisting of minimum 50 mm thick and having box like structure, slots cut and holes punched, for fixing of hardwares with stiffners as per IS: 16074 including resin bonded mineral wool / ceremic wool infill material of minimum density 96 kg/cum. Door leaf shall be provided with vison panel, having maximum area of 0.06 sqm, of 120 minute fire rated minimum 6 mm thick clear borosilicate glass pane fixed with clip-on arrangement and fire rated c€ramic tape having minimum size 13x2 mm to be lixed all around the glass on both the sides. The intumescent seal of minimum size 15x1.5 mm or ol size as per test evidence shall be flxed on all the three edges of the door leaf. The door shutter shall be mounted on the frame with SS 304 grade ball bearing butt hinges as per EN 1935 2002 or butt hinges as per lS 12817, of minimum size 100x75x3 mm @ 5 numbers hinges upto 24OOmm height or as per test evidence, whichever is more, fixed with M6 25 screws. All doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hardware accessones.				

	Hardware Accessories Fire doorset assembly shall be provided with one number of Single point Panic push bar (cross bar) device of desired finish as per EN 1125 and one number extemal trim including half cylinder of 42mm long with one side key as per EN 1125. One number heavy duty door closer of size EN 3-5 with standard arm, of desired finish (suitable upto 1250 mm door width)conforming to IS 3564/EN 1154. Finishing: Both frame and door shutters shall be factory flnished with polyester powder coating of minimum 50 microns thick and shall have passed salt spray test as per IS:13871 of approved colour and shade all complete as per manufacture/s specifications and as per direction of the Engineer-inrharge. Installation: The hollow space an the door frame shall be filled / injected with fire rated self extinguishing type polyurethane foam (PUF) after installation at site of work. The rate shall be inclusive of complete fire rated door assembly, supply and installation by the approved manufacturer.				
6.7.1	Single leaf Partially Insulated metalfire rated doorset of FD 120 Pl classification with 120 minutes integrity and 30 minutes insulation as per IS 3614:2021 - For Staircase/ Exit pathway / Refuge area etc	232	sqm	22563.57	5234748
6.8	Providing and fixing bright / matt finished Stainless Steel handles of approved quality & make with necessary screws etc all complete.				
6.8.1	125 mm	1668	each	135.7	226348
6.9	Providing and fixing cuboard shutter with 19 mm thick one side decorative and other side balancing lamination factory pressed BWP grade marine ply as per IS 710 of approved brand including 2 mm thick PVC edege banding tape with hot glue by edege bending machine etc. with auto closing spring loaded hinges (hydraulic type) etc. complete as per direction of Engineer-in-charge. (Payment of providing and fixing auto closing hinges shall be paid separately)	892.00	sqm	3220.85	2872998
6.10	Providing and fixing 19 mm thick both side balancing lamination factory pressed BWP grade marine ply as per IS 710 of approved brand boxes, shelves, racks, almirah, cupboard and drawer etc. including necessary nails, screws etc. complete as per direction of Engineer-in-charge.	1320.00	sqm	2952.07	3896732
6.11	Providing and fixing stainless steel fancy handle of approved make fixed with SS screws etc. complete as per direction of Engineer-in-charge.				
6.11.1	200 mm	1776.00	each	212.48	377364
6.12	Providing and fixing stainless steel soft closing spring hinges at 0 degree hinges (hydrarlic type) of approved make/brand to cupboard shutters with full threaded steel screws including making necessary recess in board and finished etc. complete as per direction of Engineer-in-charge.	1536.00	each	309.65	475622
6.13	Providing and fixing stainless steel soft closing heavy type telescopic drawer channels of approved make 500 mm long with screws etc. complete as per direction of Engineer- in-charge.	1296	one set	1007.61	1305863

6.14	Providing and fixing ready made 304 grade stainless steel Modular kitchen basket and accessories such as right angle basket (Plain Cup & Saucer, plant, Partition, Bottle rack, Thali, Cutlery) kitchen utensil basket, Dinner set basket, kitchen grain basket, Multipurpose basket as per site requirement including finishing (wherever required) and fittings. The same shall be fixed with necessary stainless steel nuts & bolts, Stainless Steel screws & telescopic channel etc. as per direction of Engineer-incharge. (For payment purpose only weight of Stainless steel basket shall be considered excluding weight of all fixing accessories such as nuts, bolts, fasteners telescopic basket channels etc. Payment of providing and fixing telescopic channel shall be paid separately)	3051	Kg	607.06	1852140
6.15	Providing and fixing factory-manufactured 60-minute fire-rated, smoke-check, asbestos-free composite wooden single-leaf doorset, complete with minimum 120 × 70 mm 2nd class teak wood fire-rated frame, 45–57 mm thick composite fire-rated shutter as per manufaturer's size,thickness section , comprising hardwood stiles and rails of approximately 75 mm width , two reinforced calcium silicate boards, one on each face, free from asbestos, brucite and meerschaum, with density, thermal conductivity , fire-resistant insulation core; 3 mm thick commercial plywood and 1 mm thick decorative laminate on both faces conforming to the approved manufacturer's specifications, second-class teak wood lipping on all edges , malamine polish on Edges of shutter and exposed teak wood frame and beeding , intumescent fire/smoke seals, fire-rated hinges SS ball-bearing hinges of size 102 mm × 76 mm × 3 mm, Stainless steel mortice lock, cylinder, lever handles, door closer wherever required, architrave, fire-rated fixing fasteners, anchors, sealants, perimeter fire stopping, polishing/finishing and all necessary fittings and fixtures, tested and certified as a complete doorset for minimum 60 minutes in accordance with BS 476 Part 22 and/or IS 3614 (Part 2), or applicable accepted standard, including supply, installation, adjustment, testing, certification and making good, complete as per approved drawings, manufacturer's tested assembly and directions of Engineer-in-Charge.	252	Sqm	17095.81	4308144

6.16	Providing and fixing factory-manufactured double-skin, single-leaf, glazed galvanized steel door assembly, minimum 46 mm thick, comprising 20-gauge (0.95 mm) galvanized steel shutter with minimum 100 mm wide box-type vertical stiles and top/bottom rails, EPS/thermocol internal filling, 6 mm clear float glass with glazing beads and gaskets, 18-gauge (1.27 mm) galvanized steel door frame of nominal 80 × 50 mm single-rebate profile, polyester powder coating minimum 50 microns dry film thickness (DFT), SS ball-bearing hinges of size 102 mmx76 mmx3mm, SS 304 shaft mortice deadlock with 50–80 mm backset, minimum 20 mm square forend, Allen-key-operated mechanism and SS 304 dead strike plate, SS 304 recessed flush pull handleminimum size 40 mm × 120 mm, fixing fasteners, anchors, screws, PUF filling to frame where required and all necessary fittings, fixtures, accessories and fixing materials, including transportation, installation, alignment, anchoring, adjustment, sealing, making good and all incidental works, complete as per approved drawings, manufacturer's specifications and directions of Engineer-in-Charge.	72	sqm	9897.58	712626
6.17	Providing and fixing fly-proof stainless steel wire mesh of Grade SS 304 in windows and clerestory windows, having an average aperture of 1.0 mm × 1.0 mm in both directions, woven from 0.34 mm diameter stainless steel wires, including cutting to the required size, fixing securely in position with suitable stainless steel/Aluminium or corrosion-resistant fixing accessories, and all necessary fitting, finishing and incidental works, complete in all respects as per the approved drawings, specifications and directions of the Engineer-in-Charge.				
6.17.1	With Aluminium/UPVC snap beeding & necessary screws [Snap beeding will be paid separately].	282	sqm	1252.10	353092
6.18	Providing and fixing stainless steel brush/satin finish tower bolts with necessary SS screws complete as per architectural drawing and as per direction of Engineer-in-charge.				
6.18.1	250mm long	853	each	360.59	307583
6.19	Providing & fixing SS 304 grade of satin finish Stainless steel (304 grade) sliding door bolts with nuts and screws etc in door (aluminium / wooden flush shutters) with necessary SS 304 grade screws etc. complete as specified in Architectural drawing and as per direction of Engineer-in-charge.				
6.19.1	300mm long 16mm dia.	1646	each	953.42	1569329
6.19.2	200 mm long 16mm dia.	302	each	730.20	220520
6.20	Providing & fixing SS 304 grade of satin finish Stainless steel latch make in door (aluminium / wooden flush shutters) with necessary SS 304 grade screws etc. complete as specified in Architectural drawing and direction of Engineer in charge.				
6.20.1	200mmx12	298	each	655.80	195428
	SUB HEAD TOTAL=				**43044467**
7	**STEEL WORK**				

7.1	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	5495.00	Kg	152.21	836394
7.2	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6mm angle iron and 3mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer.				
7.2.1	Using flats 30x6mm for diagonal braces and central cross piece.	4	sqm	6333.83	25335
7.3	Providing and fixing M.S. fan clamp type I or II of 16 mm dia M.S. bar bent to shape with hooked ends in R.C.C. slabs or beams during laying including painting the exposed portion of loop, all as per standard design complete.	128	each	257.28	32932
7.4	Providing and fixing circular/ Hexagonal cast iron or M.S. sheet box for ceiling fan clamp, of internal dia 140mm, 73mm height, top lid of 1.5mm thick M.S. sheet with its top surface hacked for proper bonding, top lid shall be screwed into the cast iron/ M.S. sheet box by means of 3.3mm dia. round headed screws, one lock at the corners. Clamp shall be made of 12mm dia M.S. bar bent to shape as per standard drawing.	1176	each	251.19	295399
7.5	Steel work welded in built up sections/framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel/tubular steel etc.as required.				
7.5.1	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works.	20230	kg	196.49	3974993
7.6	Providing and fixing carbon steel galvanised (minimum coating 5 micron) dash fastener of 10 mm dia. Double threaded 6.8 grade (yield strength 480 n/mm2), counter sunk head, comprising of 10 m dia polyamide PA 6 grade sleeve, including drilling of hole in frame, concrete/masonry etc, as per direction of Engineer-in-charge.				
7.6.1	10 x 160 mm	7504	each	255.57	1917797
7.7	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc. including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge. (For payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.)	2062	kg	879.31	1813137
	SUB HEAD TOTAL=				**8895987**
8	**FLOORING**				
8.1	Extra for granite stone flooring in treads of steps and risers using single length upto 2.00 metre .	928	sqm	969.7	899882

8.2	Kota stone slabs flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and mirror polishing complete with base of cement mortar 1:4 (1 cement :4 coarse sand)				
8.2.1	25 mm thick kota	188	sqm	2217.91	416967
8.3	Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and mirror polishing complete.	11	sqm	2680.61	29487
8.4	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300mm or more (thickness to be specified by the manufacturer), of 1stquality conforming to IS : 15622, of approved make, in colours White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4(1 Cement: 4 Coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete.	832	sqm	1514.09	1259723
8.5	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer)with water absorption less than 0.08% and conforming to IS : 15622, of approved brand and manufacturer, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including including providing 3mm thick PVC spacers and grouting the joints with white cement and matching pigments etc., The tiles must be cut with the zero chipping diamond cutter only. Laying of tiles will be done with the notch trowel, plier, wedge. clips of required thickness, levelling system and rubber mallet for placing the tiles gently and easily.				
8.5.1	Glazed vitrified floor tiles polished finish of size				
8.5.1.1	Size of Tile 600 x 600 mm	6883	sqm	1710.75	11775092
8.5.2	Glazed vitrified floor tiles Anti skid finish of size				
8.5.2.1	Size of Tile 600 x 600 mm	1768	sqm	1667.6	2948317
8.6	Crazy ceramic Anti skid finish tile flooring, with under layer 12 mm thick cement mortar 1:4 (1 cement: 4 coarse sand), with joints not exceeding 5 mm, including filling the gaps with ordinary cement mixture & mixing with synthetic polyester fibre, triangular in shape having specific gravity of1.34 to 1.40, cross section size ranging from 10 to 40 micron & length upto 6 mm , mixing fibre @ 125 grams per 50 kg of cement in cement mortar, including providing and mixing water proofing material in mortar@ 1 kg per 50 kg of cement , all complete as per direction of Engineer-in-charge.	1560	Sqm	1086.21	1694488
8.7	Providing and laying polished Glazed Vitrified /Vitrified floor tiles/Anti skid finish tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm **i**and grouting				

	the joint complete as approved by Engineer-in-charge.				
8.7.1	Size of Tile 600x600 mm	1040	sqm	1847.7	1921608
8.8	Providing and laying Polished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing , curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
8.8.1	Polished Granite stone slab jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent	2105	sqm	5101.56	10738784
8.8.2	Polished Granite stone slab of all colour and texture except Black, Cherry/Ruby Red	2105	sqm	3496.11	7359312
	SUB HEAD TOTAL=				**39043660**
9	**ROOFING**				
9.1	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 1mx1mx400micron, finished with 12mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	20	each	339.53	6791
9.2	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion, (i) Single socketed pipes				
9.2.1	110 mm diameter	900	metre	429.64	386676
9.3	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.				
9.3.1	Bend 87.5°				
9.3.1.1	110 mm bend	20	each	171.16	3423
9.3.2	Shoe (Plain)				
9.3.2.1	110 mm Shoe	20	each	127.38	2548

9.4	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :				
9.4.1	12.5 mm thick tapered edge gypsum moisture resistant board	472	sqm	1740.74	821629
9.5.1	Providing and fixing to the inlet mouth of rain water pipe PTMT (an Engineering Thermoplastic) grating square (Slit) 150 mm square with a height of 8 mm and weighing not less than 100 gms.	20	each	96.25	1925

9.6	Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main “T” runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross “T” of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main “T” at 600 mm center to center to form a grid of 1200x600 mm and secondary cross “T” of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main “T” runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge.				
9.6.1	GI Metal Ceiling Lay in plain Tegular edge Global white color tiles of size 595x595 mm, and 0.5 mm thick with 8 mm drop; made of G I sheet having galvanizing of 100 gms/sqm (both sides inclusive) and electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.	757	Sqm	2166.34	1639919

9.7	Designing, providing and fixing multicell (rectangular/triangular Cells as per manufacturer's specifcation) three or more layered polycarbonate sheet panel, co-extruded with Ultra Violet (UV) protective coating on external surface, with standing seam on both the running ends. The sheet shall be connected using polycarbonate connectors having grip-lock double-tooth locking mechanism and provided with end caps at the ends to ensure water and air tightness. The light transmission from transparent or translucent or opaque or in combination polycarbonate sheet, varies from 15 to 85%, shall be decided by Engineer-in-Charge as per requirement.The polycarbonate sheet shall have Dart Drop Impact Value more than 60 Joules as per IS 14434:2021 and shall have either flame retardancy of Class B1-BS 476/94 V-0 category as per IS 14434:2023 or Category V-0 & HF-1 as per ASTM D635-10 or BS 476 classification as per EN 13501-1 for fire safety.The yellowness index tested as per ASTM E313 (D1925) or ASTM E313 (D1925) shall be equal to or more than 10 unit or 6 units respectively on a sample after 5000 hours of exposure to UV/sunlight.The cross-section ends of polycarbonate sheet shall be provided with self-adhesive aluminium impermeable tape at top and aluminium ventilated tape at bottom of the sheet and covered with polycarbonate/aluminium U-shaped protective profile. The polycarbonate sheet shall be held in position by using stainless steel (SS 304 grade) trapezoidal cleat of 1 mm thick having minimum bottom width 35 mm and top width 50 mm or any other shape and size as per design requirement and manufacturer's specification. The cleat shall be fixed with 2 or more stainless steel screws of 5 mm diameter and 25 mm long with structural steel framework. The cleat shall be tested to withstand pull-out force equal to wind speed of 50 m/s as per IS 875 and design test report shall be submitted to Engineer-in-Charge for approval before use. The cost of ridge and gutters of pre-coated galvanized iron sheet of approved specifications and structural steel framework shall be paid in respective items separately.				
9.7.1	16 mm thick of required width of Coxwell/DPI-daylighting /Lexan/Danpalon/Palaram, 1000 (±10%) wide panel with U-value not more than 2.10 W/m²K and weight not less than 2.75 kg/m²	305	sqm	4187.81	1277282
	SUB HEAD TOTAL=				**4140193**
10	**FINISHING**				
10.1	Extra for plastering exterior walls of height more than 10 m from ground level for every additional height of 3 m or part thereof.	114480	sqm	99.16	11351837
10.2	Finishing walls with 100% Premium acrylic emulsion paint having VOC less than 50 gm/litre and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives.				

10.2.1	New work (Two or more coats applied @ 1.43 litre/10 sqm. Over and including priming coat of exterior primer applied @ 0.90 litre/10 sqm.	4500	Sqm	206.34	928530
10.3	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.				
10.3.1	On steel work	1322	sqm	275.21	363828
10.4	Providing and applying white cement based putty of average thickness 1 mm , of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	50900	sqm	177.65	9042385
10.5	Wall painting with Premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including apprlying additional coats wherever required, to achieve even shade and colour.				
10.5.1	Two coats	55080	sqm	162.56	8953805
10.6	Applying priming coat with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content:				
10.6.1	With water thinnable cement primer on wall surface having VOC content less than 50 grams/ litre.	55080	sqm	84.19	4637185
10.7	Polishing in high gloss/matt finish melamine clear polish on wood work in required color/wooden shade texture with following process in the sequence as detailed below:	1833	sqm	1548.75	2838859
	1. The surface to be polished is rubbed with sand paper 80/120 no. and then with sand paper of 160/180 nos.				
	2. Applying two coats of sealer with spray gun and allowing sufficient drying time for 1st coat and 2nd coat is allowed to dry for 8 to 12 hrs.				
	3. On drying of sealer coat, wet rubbing with emery cloth of finer grading with water to remove excess sealer layer and make the surface further smooth after this wet rubbing, then surface is applied with special grade melamine fillers to fill all the small and big holes/grooves etc. Filler coat to be allowed to dry for 4 to 6 hrs on which again a light wet rubbing is done this surface is further allowed to dry for 12 hrs.				
	4. On this, 1st coat of melamine polish is applied with spray gun using melamine clear polish and melamine thinner in required proportion. This 1st coat is allowed to dry for 24 hrs then this dry surface is again fine wet rubbed smooth, which is further allowed to dry for 12 hrs. The final melamine polish is applied with compressor pressure spray gun using melamine clear polish and melamine thinner mixed in required proportion complete as per direction of Engineer-in-Charge. (Finalo coat to be done in 1 or 2 layers without gap of time.)				

10.8	Providing and applying Self Curing/Curing Free Ready-Mix Plaster of approved brand and manufacture, having minimum compressive Strength of 6.0 mPa, of specified thickness in one coat on new/old surface of walls/ceiling, using factory produced, pre-blended, premixed, formulated Self Curingicuring Free readymix mortar supplied in dry form requiring only the addition of water at the site before start of application. The material shall have self-curing properties eliminating the need for post-application of water (curing). The ambient temperature at the time of application should not exceed 40' Celsius .*It should be applied on hacked/uneven background such as bare brick/CC and Block/RCC surface after preparatton of surface etc. complete, including applying Portland cement slurry @0.40Kg/Sqm, as per manufacturer's specification finished in smooth line and level at locations and all floors. In case, ambient temperature exceeds 40'C, manufacturer's specification may be followed.				
10.8.1	6 mm thick	44261	Sqm	358.2	15854290
10.8.2	12 mm thick	28040	Sqm	578.54	16222262
10.9	Providing and applying Self Curing/Curing Free Ready-mix Plaster of approved brand and manufacturer on new/old surface of walls/ceiling using factory produced, pre-blended, premixed, formulated self-curing/curing free ready-mix mortar, having minimum compressive strength of 6.0MPa, supplied in dry form requiring only the addition of water at the site before start of application. The material shall have self-curing properties eliminating the need for postapplication water (curing). The ambient temperature at the time of application should not exceed 40"Celsius .* It should be applied on hacked/uneven background such as bare brick/Cc and Block/RCC surface after preparation of surface etc. complete, as per manufacturers specification including applying Portland cement slurry @0.40K9/Sqm. It shall be applied in two layers, under layer 12mm thick finished with top layer 6mm thick finished in smooth line and level etc. complete. In case, ambient temperature exceeds 40'C, manufacturer's specification may be followed.				
10.9.1	18 mm cement plaster in two coats under layer 12 mm thick finished with a top layer 6 mm thick	11950	Sqm	905.49	10820606
	SUB HEAD TOTAL=				**81013587**
11	**DISMENTAL AND DEMOLISING**				

11.1	Dismantling/Demolishing of Existing Buildings (02 Nos. G+5 Storeyed Buildings): Dismantling/demolishing of existing 02 Nos. G+5 storeyed buildings(Approximate area7290.36 sqm)-, situated at the construction site of proposed "Construction of Residential Quarters & Guest Rooms for SIB at Mahim", on "AS IS, WHERE IS" basis, at all heights and levels, including excavation to required depth and complete removal of foundations, superstructure comprising brickwork, RCC, PCC, flooring, doors/windows, partitions, false ceiling, water supply, sanitary and drainage lines with fixtures, electrical lines with fixtures, etc., and dismantling/removal of surrounding PCC/RCC/paver block pavements and other small structures, whether below or above plinth level, complete. The item shall include segregation, loading, unloading, transportation and disposal of unserviceable materials/debris at the authorized municipal dumping ground, including all leads and lifts. All materials obtained from dismantling/demolition, unless otherwise specified in the Contract, shall be the property of the contractor and at his disposal; however, no serviceable material shall be used in the proposed work. The item shall also include complete site clearance, removal of all foundations and obstructions, dressing and levelling of the site to make it suitable for setting out and execution of the proposed work. After demolition, the ground level within the plot shall be maintained at the existing minimum road level surrounding the buildings, so that the proposed construction activities forming part of this tender can be commenced. The rate shall include all labour, materials, tools, plants, machinery, excavation, demolition, loading, unloading, carriage, disposal charges, leads, lifts and all incidental works necessary for complete execution of the item. Nothing extra shall be payable on any account. Final site levels shall be jointly recorded before commencement of the proposed construction work, and measurement of the proposed building work shall thereafter be taken with reference to such recorded levels/conditions, as applicable under the Contract.	1	job	-5216329	-5216329
	SUB HEAD TOTAL=				**-5216329**
12	**ROAD WORK**				
12.1	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement in position to the required line, level and curvature jointed with cement mortar 1:3 (1 cement : 3 coarse sand) including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	10	cum	11517.98	115180

12.2	Providing and laying C.C. pavement of mix M-25 with ready mixed concrete from batching plant. The ready mixed concrete shall be laid and finished with screed board vibrator , vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in charge. (The panel shuttering work shall be paid for separately). (Note:- Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/ recoverable separately).	221	cum	11183.51	2471556
	SUB HEAD TOTAL=				**2586736**
13	**SANITARY INSTALLATIONS**				
13.1	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required :				
13.1.1	Kitchen sink with drain board				
13.1.1.1	510x1040 mm bowl depth 250 mm	88	Each	7906.94	695811
13.2	Providing and fixing white vitreous china water closet squatting pan (Indian type) :				
13.2.1	Orissa pattern W.C. pan of size 580x440 mm	2	each	3607.68	7215
13.3	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
13.3.1	Flexible pipe				
13.3.1.1	32 mm dia	324	each	136.1	44096
13.4	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality 5 mm to 8 mm thickness as available) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	238.00	each	1830.51	435661
13.5	Providing and fixing soil, waste and vent pipes :				
13.5.1	100 mm dia.				
13.5.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	2468	metre	1331.14	3285254
13.6	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
13.6.1	100 mm dia				
13.6.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	302	each	645.71	195004
13.7	Providing and fixing plain bend of required degree.				
13.7.1	100 mm dia				
13.7.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside as per IS:15905	302	each	418.93	126517
13.8	Providing and fixing single equal plain junction of required degree :				
13.8.1	100x100x100 mm				
13.8.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	480	each	661.93	317726
13.9	Providing and fixing terminal guard:				
13.9.1	100 mm				
13.9.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	32	each	487.01	15584

13.10	Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe				
13.10.1	100 mm dia				
13.10.1.1	SS 304 grade coupling with EPDM rubber gasket	1152	each	491.85	566611
13.11	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors :				
13.11.1	100 mm inlet and 100 mm outlet				
13.11.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	584	each	972.83	568133
13.12	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.				
13.12.1	Total bracket length 580mm of approved shape and design (for single, 100mm dia pipe).	576	each	346.13	199371
13.13	Providing and fixing white vitreous china extended wall mounting water closet of size 780x370x690 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 4 litre/ 8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete.	238.00	each	17075.18	4063893
13.14	Providing and fixing white vitreous china flat back urinal basin with standard flush pipe and C.P. brass spreaders with brass unions and G.I clamps complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required and conforming to manufacturer Standards.				
13.14.1	Jaquar series URS-WHT-13261H/CERA series Capriana Cat no S4020112/Hindware 600002	2	each	6016.29	12033
13.15	Providing and fixing **counter top** wash basin of of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require etc complete of approved make.				
13.15.1	Jaquar JDS-WHT-25909/CERA series Comid Cat no. S2020153/ Hindware New Mirina -91237	238	each	6851.24	1630595
	SUB HEAD TOTAL=				**12163504**
14	**WATER SUPPLY**				

14.1	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including 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				
14.1.1	20 mm nominal outer dia. Pipes.	346	metre	381.37	131954
14.1.2	32 mm nominal outer dia. Pipes.	3399	metre	590.55	2007279
14.1.3	40 mm nominal outer dia. Pipes.	3399	metre	800.25	2720050
14.1.4	50 mm nominal outer dia. Pipes.	1250	metre	1063.45	1329313
14.2	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.				
14.2.1	20 mm nominal outer dia .Pipes.	1800	metre	612.01	1101618
14.2.2	25 mm nominal outer dia .Pipes.	268	metre	714.07	191371
14.3	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the walls etc. **Internal work - Exposed on wall**				
14.3.3	50 mm dia. nominal bore	107	metre	1193.45	127699
14.4	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc. **External work** :				
14.4.1	50 mm dia. nominal bore	50	metre	867.64	43382
14.5	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
14.5.1	32 mm nominal bore.	32	each	785.05	25122
14.5.2	40 mm nominal bore	10	each	940.44	9404
14.5.3	50 mm nominal bore	96	each	1168.75	112200
14.6	Providing and fixing brass ferrule with C.I. mouth cover including boring and tapping the main :				
14.6.1	25 mm nominal bore	2	each	554.18	1108
14.7	Providing and fixing unplasticised PVC connection pipe with brass unions :				
14.7.1	45 cm length				
14.7.1.1	15 mm nominal bore	120	each	111.28	13354
14.8	Painting G.I. pipes and fittings with synthetic enamel white paint over a ready mixed priming coat, both of approved quality for new work :				
14.8.1	50 mm diameter pipe.	107	metre	58.06	6212
14.9	Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality :				
14.9.1	50 mm diameter pipe	50	metre	34.72	1736
14.10	Providing and filling sand of grading zone V or coarser grade all-round the G.I. pipes in external work.				
14.10.1	50 mm diameter pipe	50	metre	197.23	9862

14.11	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work)				
14.11.1	40 mm nominal bore	10	each	718.68	7187
14.11.2	50mm nominal bore	10	each	937.82	9378
14.12	Providing and Fixing 2-Way Bib Tap of 15 mm nominal bore in Polished Chrome of approved make.				
14.12.1	Jaquar series CQT-CHR-23041 or equivalent of Kohler/Grohe/Roca	268	each	1568.29	420301
14.13	Providing and Fixing C.P. Brass 2-1 wall mixer non telephonic shower of 15 mm nominal bore in Polished Chrome of approved make.				
14.13.1	Jaquar series CQT-23273UPR or equivalent of Kohler/Grohe/Roca	268	each	5516.93	1478537
14.14	Providing and Fixing Health Faucet with metal hose and Holder in Polished Chrome of approved make.				
14.14.1	Jaquar series ALD-CHR-579 or equivalent of Kohler/Grohe/Roca	268	each	1471.39	394333
14.15	Providing and Fixing C.P. brass pillar cock of 15 mm nominal bore in Jaquar series COP-CHR-021NPM or equivalent of Kohler/Grohe/Roca	268	each	2691.15	721228
14.16	Providing and Fixing Angle Valve of 15 mm nominal bore in Polished Chrome of approved make.				
14.16.1	Angle Valve of Jaquar series CQT-CHR-23059 or equivalent of Kohler/Grohe/Roca	802	each	1107.07	887870
14.17	Providing and Fixing Sink cock of 15 mm nominal bore for Kitchen sink in Polished Chrome of approved make.				
14.17.1	Sink cock:Jaquar series CQT-CHR-23123 or equivalent of Kohler/Grohe/Roca	120	each	2545.80	305496
14.18	Providing and Fixing Pressmatic Urinal flush valve in Polished Chrome of approved make.				
14.18.1	jaquar PRS-077 of Kohler/Grohe/Roca	4	each	2884.95	11540
14.19	Providing and fixing half threaded Waste Coupling in Polished Chrome of approved make.				
14.19.1	Waste Coupling of Jaquar ALD-709 or equivalent of Kohler/Grohe/Roca	268	each	679.45	182093
14.20	Providing and fixing C.P.Brass over head shower with 15 inlet with shower arm of approved make and confirming to manufacturer's standard.				
14.20.1	Jaquar series Showers OHS 1757 & Arm SHA- 477 or equivalent of Kohler/Grohe/Roca	120	each	4825.86	579103
14.21	Providing and Fixing Towel Rail in Polished chrome with minimum distances of 37 mm from wall face with concealed fittings arrangement of approved quality.				
14.21.1	Jaquar series CAN-CHR-1111SM or equivalent of Kohler/Grohe/Roca	268	each	1937.73	519312

14.22	Providing and fixing CPVC ball valve of approved quality				
14.22.1	32 mm nominal bore.	268	each	574.66	154009
	SUB HEAD TOTAL=				**13502051**
15	**DRAINAGE**				
15.1	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 :				
15.1.1	300 mm dia. R.C.C. pipe	142	metre	1131.92	160733
15.2	Constructing brick masonry manhole 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 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 :				
15.2.1	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) :				
15.2.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 3.5.	8	each	14538.12	116305
15.3	Extra for depth for manholes				
15.3.1	Size 90x80 cm				
15.3.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation as specified.	7	metre	10046.92	70328
15.4	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:				
15.4.1	For pipes 100 to 230 mm diameter	1	each	922.62	923
15.5	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks 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 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 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:				

15.5.1	Inside dimensions 455x610 mm and 45 cm deep for single pipe line				
15.5.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 3.5	10	Each	7898.17	78982
15.6	Extra for depth beyond 45 cm of brick masonry chamber				
15.6.1	For 455x610 mm size				
15.6.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 3.5	10	metre	6963.65	69637
15.7	Providing and fixing ISI-marked unplasticised polyvinyl chloride (uPVC) pipes, Schedule 40, of approved make, for concealed work, including all necessary uPVC fittings, jointing the pipes and fittings with suitable uPVC solvent cement, fixing the pipes with clamps at 1.00 m intervals, cutting chases in walls and other building members as required, making good the chased portions with cement mortar to match the existing surface, testing the joints for leakage, and completing all incidental works, complete in all respects as per the relevant IS codes, manufacturer's specifications and directions of the Engineer-in-Charge.				
15.7.1	50 mm dia OD	422	each	740.39	312445
15.8	Providing and fixing in position 600 mm clear opening cast iron (CI) circular manhole cover with square frame, complete with hinges, the combined weight of the cover and frame being not less than 42 kg, including proper seating, alignment, levelling and fixing in position with cement mortar or concrete as required, complete in all respects as per the approved drawings, specifications and directions of the Engineer-in-Charge.	10	each	5464.60	54646
15.9	Providing and fixing cockroach-trap type square floor drain cover with grating, made of stainless steel Grade AISI 304 (18/8), with flat-cut edges and glossy finish, suitable for a 100 mm outer diameter drain pipe, having an outer frame size of approximately 153 mm × 153 mm and grating size of approximately 150 mm × 150 mm, of approved make such as CHILLY, CAMRY, KICH, VIKING or NIRALI, including proper fitting, alignment, securing in position and all necessary accessories, complete in all respects as per the manufacturer's specifications and directions of the Engineer-in-Charge.	352	each	543.05	191154
	SUB HEAD TOTAL=				**1055153**
16	**PILE WORK**				
16.1	Boring, providing and installation bored cast-in-situ reinforced cement concrete piles of grade M-30 of specified diameter and length below pile cap, 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. by Crawler mounted, telescopic boom hydraulic pilling Rig all complete, including removal of excavated earth with all its lifts and leads (length of pile for payment shall be measured up to bottom of pile cap).				

16.1.1	Note: Truck Mounted rotary/ TMR / Tubewell boring machine shall not be used.				
16.1.1.1	750 mm dia piles.	4200	metre	8908.51	37415742
16.2	Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform by Kentledge/ Anchor piles method 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. Note: 1. Initial and Routine Load Test shall not be carried out by Dynamic method of testing. Note: 2. Testing agency shall submit the design of loading platform for the approval of Engineer-in-charge.				
16.2.1	Group of two or more piles upto 50 tonne Safe capacity				
16.2.1.1	Initial test (Test Load 2.5 times the Safe capacity)	4	per test	80167.4	320670
16.2.1.2	Routine test (Test Load 1.5 times the Safe capacity)	4	per test	46157	184628
16.3	Cyclic vertical load testing of pile in accordance with IS Code of practice IS:2911 (part IV) by Kentledge method including preparation of pile head etc for.				
16.3.1	Group of two or more piles				
16.3.1.1	Upto 400 tonne Safe capacity of group	4	per test	46157	184628
16.4	Lateral load testing of single pile in accordance with IS : Code of practice IS: 2911 (Part IV) for determining safe allowable lateral load on pile :				
16.4.1	Above 50 tonne and upto 100 tonne capacity pile	4	per test	37411.45	149646
16.5	Integrity testing of Pile using Low Strain/ Sonic Integrity Test/ Sonic Echo Test method in accordance with IS :14893 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, all complete as per direction of Engineer-in-charge.	300	per test	1312.81	393843
	SUB HEAD TOTAL=				**38649157**
17	**ALUMINIUM WORK**				

17.1	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections **(Domal Series)**and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :				
17.1.1	For fixed portion.				
17.1.1.1	Anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15)	9230	kg	563.57	5201751
17.1.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately).				
17.1.2.1	Anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15)	9020	kg	681.45	6146679
17.2	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer-in-charge . (Cost of aluminium snap beading shall be paid in basic item) :				
17.2.1	With float glass panes of 5 mm thickness (weight not less than 12.50 kg/sqm)	240	sqm	1713.59	411262
17.2.2	With float glass panes of 8 mm thickness (weight not less than 20 kg/sqm)	950	sqm	1918.68	1822746
17.3	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight upto 125 kg., for doors, including cost of cutting floors , embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge.				
17.3.1	With stainless steel cover plate minimum 1.25 mm thickness.	2	each	3214.7	6429
17.4	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	5	sqm	6063.06	30315

17.5	PProviding and fixing powder-coated aluminium concealed-type handle-cum-latch for aluminium sliding windows, of approved make such as Starlock, Eaglestar or equivalent, of required shape and size approximately 180 mm × 22 mm, including all necessary screws, fasteners, fixing accessories and adjustment for smooth and proper operation, complete in all respects as per the manufacturer's specifications and directions of the Engineer-in-Charge.	2811	each	116.78	328269
17.6	Providing and fixing stainless steel Grade 304 patch lock with matching strike plate for glass doors, of approved make such as Ozone (OPL-4A/4B-K2N STD SSS) or equivalent make such as Dorma, Hettich or Dorset, incorporating a high-quality Euro-profile brass pin cylinder with spring-loaded push pins for secure locking and firm fitting, and stainless steel Grade 304 cover, suitable for glass doors weighing up to 120 kg and having a door width of up to 1200 mm, including all necessary fixing accessories, fasteners, installation, alignment and adjustment for proper operation, complete in all respects as per the manufacturer's specifications and directions of the Engineer-in-Charge	2	each	4500.65	9001
17.7	roviding and fixing 100 mm wide and 4 mm thick frosted glass louver panes, inserted at 100 mm centre-to-centre spacing into anodised aluminium factory-made adjustable louver guides of approved standard pattern, including cutting and fitting the glass panes to the required size, fixing the louver guides in the existing aluminium frame, and providing all necessary screws, fasteners and fixing accessories, complete in all respects as per the manufacturer's specifications, approved details and directions of the Engineer-in-Charge. **Mode of Measurement and Payment: The item shall be measured in square metres based on the clear internal dimensions of the aluminium frame in which the glass louvers are installed. Payment for the aluminium frame, excluding the louver guides and glass louvers covered under this item, shall be made separately under the relevant item.**	95	sqm	5776.80	548796
	SUB HEAD TOTAL=				**14505248**
18	**WATER PROOFING**				
18.1	Grading roof for water proofing treatment with				
18.1.1	Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	109	Cum	9155.43	997942
18.2	Providing & Applying high quality acrylic modified resin based texture of Dholpur/Red sand stone Pattern with anti algae and UV resistance properties to be applied as intermediate finish in desired pattern @ 43.04 kgs/10 sqm to form film of 1- 1.5 mm thickness after scrapping and properly cleaning the surface to remove loose particles from the plaster surface, followed by top coating with Premium Acrylic Smooth exterior paint with Silicone additives of required shade by two or more coats @ 1.43 litres/10 sqm, complete as the direction of Engineer -in-Charge.	16190	Sqm	679.63	11003210

18.3	Providing and spray applying two component hybrid polyuria polyurelhane waterproofing system at all levels for podium garden/terrace waterproofing by the manufactuer or his approved applicator consisting following operations a) Brushing and Vacuum cleaning the surface to make free from any loose material, oil, grease, bun, did,dust etc. b) Reparing the surface if required, as per recommendation of manufactuer or his approved applicator to make it water tighl for which nothing extra shalll be paid. c) Providing and applying by spray or brush, two component solvent free resin / epory primer mixed in proportion by volume / weight as recommended by manufacturea over cement concrele surface in dry condilion, having consumption varies from 0.20 to 0 40 kg/sqm depending on the porosity and undulations in the surface. d) Providing and sprinkling washed coarse sand, as recommended by manufacturer, over freshly laid primed tacky surface @ 0.25 to 0.40 kg/sqm as directed by the Engineer-in-Charge. e) Over primed sandy surface, providing and spray applying two component hyrbrid polyurea polyurethane coating system, which shall be solvent free, mixed in proportion by volume / by weight as recommended by the manufacturer having elongataon >400%, Shore A Hardness > 75 {after 28 days), tensile strength of minrmum of 10 MPa as per DIN /ASTM and Tear strength minimum 30N/mm as per DIN 53515 or minimum 45 N/mm as per ASTIV D624 and 20 second maximmum gel time / reaction lime with minimum 1.5 mm dry film thickness of two coals. f) A layer of non woven polypropylene geotextile of minimum mass / unit area of 120 gsm with an overlap of 50 mm shall be laid over the polyurea/polyurelhane coating surlace, having minimum lensile strength 2.40 KN/m as per ASTM D 4595. g) Providing and laying screed of cement concrete 1:1.5:3 ('1 Cement : 1.5 Corase sand : 3 graded slone aggregate 20mm nominal size) of mjnamum thickness 50 mm al Khu.ra with a slope of 1:100 lowards (Khurra to ridge of roof (Screed shall be paid for separately). h) Providing and laying Dimple drain boards with inbuilt geo texile drainage membrane on top having dimple height of 20-25 mm, average number of dimples 400 per sqm, compressive strength not less than 180 kN/m2 and geotextile drainage member having mass of 120 gsm. laid with minlmum overlap of 50 mm Note lf HDPE Drain cells / Drainmats along with a layer of geotextile having weight of 120 gsm and tensile strength not less than 2.4 kN/m as per ASTM D 4595 is provided in place of dimple draan board with inbuilt geotedile, it shall not be paid as extra.				
18.3	New Work on Horizontal Surfacas	1527	sqm	3075.93	4696945

18.4	Providang and spray applying two component hybrid polyuria polyurethane waterproofing system at all levels for podium garden walerproofing by lhe manufactuer or his approved appljcator consisting of following operations a) Brushing and Vacuum cleaning the surface to make free from any loose malerial, oil, grease, burr, dirt,dust etc. b) Providing and laying coving in concave shape ofcement concrete 1:1.5:3 (1 cement: 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size) of size 75 mm x 75 mm at the junction of verlical walr and horizonlal surface along the length of wall c) Providing and applying by spray or brush, two component solvent free resin / epory primer mixed in proportion by volume / weight as recommended by manufacturer over cemenl concrete surface in dry condition, having consumption from 0.20 to 0.40 kg/sqm depending on the porosity and undulations in the surface. d) Providing and sprinkling washed coarse sand, as recommended by manufacturer, over freshly laid primed tacky surface @ 0.40 to 0.50 kg/sqm as directed by the Engineer-in-Charge. e) Over primed sandy surface, providing and spray applying two componenl hyrbrid polyurea polyurethane coating system, which shall be solvenl free, mixed in proportion by volume / by weignt as recommended by the manufacturer having elongation >4OO%, Shore A Hardness > 75 (after 28 days), tensile strength of minimum of 10 Mpa as per DIN /ASTM and rear strength minimum 30 N/mm as per DIN 53515 0r minimum 45 N/mm as per ASTM 0624 and 20 second maxammum gel time / reaction time with minimum 1.5 mm dry film thickness of two coats.				
18.4.1	New Work on Vertical Surface	352	sqm	2554.25	899096
18.5	Providing and laying 1.5 mm thick pre-applied fully bonded, HDPE membrane for Type A (barrier protection) as per IS 16471 :2017, for external waterproofing system below horizontal RCC raft/slab, with thermo-fused laps, of approved make having tensile strength of > 25 MPa as per ASTM D 412, elongation of > 500 % as per ASTM D 412, puncture resistance of > 1000 N as per ASTM E 154, hydrostatic head resistance > 60 m as per ASTM D 5385, lap peel adhesion of > 450 N/m at 22 °C as per ASTM D1876. Methodology for laying of membrane shall be conforming to IS 16471:2017 and requirements of underground waterproofing structures, as per manufacturer's recommendation. The HDPE shall be laid over plain cement concrete (PCC) slab after proper surface preparation. The membrane should be minimum 1.2 m or maximum available width to reduce the number of joints, with min. 75 mm factory made selvedges which comprises of a pressure sensitive adhesive layer over the HDPE material, which is covered by a weather proof protective and trafficable granular layer to protect self adhesive polymer layer. The membrane overlaps should be thermo-fused by hot air welding with double seam welding machine to ensure seamless joints.				

	The membrane shall be terminated 50 mm below RCC raft thickness, as per manufacturer's specifications, for proper seaming with the vertical external waterproofing system. The system includes PCC base preparation by cleaning, brushing and removal of flaky materials, oil & grease, grouting the porous area with cementitious grout, all as per manufacturer's specifications. The rates for the waterproofing system are inclusive of all labor, material and tools and plants.The waterproofing system should be applied directly by the manufacturer or by authorized applicator of the company with 10 years of system guarantee against leakage (Guarantee bond format provided elsewhere in the tender document).	1672	sqm	1038.21	1735887
18.6	Supplying and laying 1.5 mm thick SBS modified self adhesive waterproofing membrane topped with HDPE valeron film of Type A (barrier protection) as per IS 16471 :2017, for external waterproofing system along the vertical surfaces of RCC walls of approved make having tensile strength of 4 MPa and with minimum transverse elongation > 200% (as per ASTM D 5147 / D412) and minimum longitudinal elongation > 200% (as per ASTM D 5147 / D412) and puncture resistance of >200 N (as per ASTM E154)..				
	Methodology for laying of membrane shall be conforming to IS 16471:2017 and requirements of underground waterproofing structures, as per manufacturer's recommendation. The SBS membrane should be sealed properly at joints & maintaining 75 mm overlap between the membrane selvedge & 100 mm overlap on the end joints of the membrane over the surface etc. The system includes PCC base preparation by cleaning, brushing and removal of flaky materials, oil & grease, grouting the porous area with cementitious grout and priming the surface with cold applied bituminous primer @ 5 sqm per litre, of approved make, followed by installation of waterproofing membrane. Apply aluminium Strip (patti) of 4 mm thick & 20 mm wide, screwed with stainless shot-screw at a distance of 400 mm C/C at the top edge along the periphery. The rates for the waterproofing system are inclusive of all labor, material and tools and plants. The waterproofing system should be applied directly by the manufacturer or by authorized applicator of the company with 10 years of system guarantee against leakage (Guarantee bond format provided elsewhere in the tender document). (Aluminium strip shall be paid separately in relevant item.)	987	sqm	1010.52	997383
18.7	Providing and laying waterproofing coating on the sunken portion of the WCs, bathroom on sound and perfectly clean surface, etc. by applying Two-component pre-packed high-flexibility polymer modified cementitious mortar using a roller or brush to the floor area in a two or more coat and all the coats to be applied in right angle to each other. For waterproofing application by trowel or with a roller approximately 1.6 kg. per sqm. per mm of thickness is required to achieve 2 mm of Dry Film Thickness (DFT) over base concrete having moisture content less than	1465	sqm	1107.42	1622370

	5% on both horizontal and vertical surfaces. Minimum 5 Days curing to be done before laying tiles. The coating shall have following properties : 1. Minimum Adhesion to substrate after 28 days 1.0 Mpa, (ASTM D4541) 2. Minimum Crack Bridging Capacity is upto 2.0 mm, (ASTM C1305 modified) 3. Minimum Elongation is 120% (ASTM D 412) The system should include: 1. Cleaning the surface, removing the laitance, and Small cracks up to 5mm needs to be repaired with crack filling material as per manufacturer's specification. 2. Angle fillet of 50X50mm need to be prepared with Pre packed Polymer modified mortar as per manufacturer's specification. 3. Pipe penetration up to 120mm dia need to treat with Pre packed Polymer modified mortar of approved make and Pipe penetration in vertical wall – Center part of PVC pipe (Center of width of wall) should be roughened by sandpaper and shall be coated with 2 component epoxy bonding agent followed by micro silica sprinkling on it or fixing of Silica sand topped HDPE tape over roughen surface as per manufacturer's specification. Protection screed over it with required slope is provided which shall be paid separately in 1:2:4, all complete with material labour and machinery needed, as per manufacturers specifications and directions of Engineer-in-charge.The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes Nothing extra shall to be paid.				
	SUB HEAD TOTAL=				**21952833**
19	**NEW TECHNOLOGIES AND MATERIALS**				
19.1	Providing and fixing false ceiling at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595 mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS:476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity < 0.043 W/m K as per ASTM 518:1991, in true horizontal level suspended on interlocking metal powder coated T-Grid of hot dipped galvanised iron section of 0.40 mm thick on Silhouette profile,rotary stiched double webbed white with 6 mm reveal profile (white/black), comprising of main-T runners of size 15x42 mm of length 3000 mm, cross - T of size 15x42 mm of length 1200 mm and secondary intermediate cross-T of size 15x42 mm of length 600mm to form grid module of size 600 x 600 mm,				

	suspended from ceiling using galvanised mild steel items (galvanizing @ 80 grams per sqm) i.e. 50 mm long, 8 mm outer diameter M-6 dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 85x25x2 mm. Galvanised iron perimeter wall angle of size 22x19x0.40 mm of length 3000 mm to be fixed on periphery wall / partition with the help of plastic rawl plugs at 450 mm center to center and 40mm long dry wall S.S screws. The work shall be carried out as per specifications, drawing and as per directions of the Engineer-in-Charge.				
19.1.1	With 15 mm thick integral densified micro edge light weight calcium silicate false ceiling tiles	570	sqm	2994.47	1706848
19.2	Providing and fixing fectory made single extruded WPC (Wood Polymer Composite) solid door /window/clerystorey windows & other frames / chawkhats comprising of virgin PVC polymer of K value 58-60 (suspension grade), calcium carbonate and natural fibers (wood powder/ rice husk / wheat husk) and non toxic addatives (maximum toxicity index of 12 for 100gms) fabricated with miter joints after applying PVC solvent cement and screwed with full body threaded star headed SS screws having minimum frame density of 750kg/cum, screw withdrawal strength of 2200N (face) & 1100N (edge), minimum compressive strength of 58N/mm2, modulas of elasticity 900N/mm2 and resistant to spread the flame of class A category with property of being termite/borer proof, water/ moisture proof and fire retardant and fixed in position with M.S. holdfast/lugs/ SS dash fastners of required dia and length complete as per direction of Engineer in charge. (MS hold fast / lugs or SS dash fasteners shall be paid for separately). Note : For WPC solid doors / window frames, minus 5 mm tolerance in dimensions i.e. depth and width of profile shall be acceptable variation in profile dimension on plus side shall be acceptable but no extra payment on this account shall be made.				
19.2.1	Frame size 50 X 100 mm	1980	metre	1078.87	2136163
19.3	Providing & fixing factory made single extruded WPC (Wood Polymer Composite) solid decorative type flush door shutter of required size coprising of virgin polymer of K value 58-60 (Suspension Grade), Calcium carbonate and natural fibers (wood powder / rice husk / wheat husk) and non toxic additives (maximum toxicity index of 12 for 100 gms) having minimum density of 650 kg/cum and screw withdrawal strength of 1800 N (Face) & 900 N (Edge), minimum compressive strength 50 N/mm^2, modulus of elasticity 850 N/mm^2 and resistance to spread of flame of Class A category with property of being termite / borer proof, water/moisture proof and fire retardant .				

	WPC to be laminated with PVC foil of minimum 14 micron thick of approved design pasted with hot melt adhesive on both faces of shutter and fixing with stainless steel butt hinges of required size with necessary full body threaded star headed counter sunk S.S.screws, all as per direction of Engineer-in-Charge. Note : Stainless steel butt hinges and necessary S.S.screws shall be paid separately.)				
19.3.1	30 mm thick	405	sqm	5423.61	2196562
19.4	Providing and fixing factory made 18 mm thick single extruded WPC (Wood Polymer Composite) solid plain white/ colour board Jali,CNC (Computer numeric control) routed of approved design by Engineer-in charge which are machine cut for duct/shaft covering ,partitions and facades copromising of virgin polymer of K value 50-60 (Suspension Grade) , calcium carbonate and natural fibers (wood powder/rice husk.wheat husk) and non toxic additive (maximum tixicity index of 12 for 100 gms) having minimum density of 650 Kg/cum and screw withdrawal strength of 1800 N (Face) minimum compressive strength 50 N/mm2, moduls of elasticity 850 N/mm2 and resistance to spread of flame of class A category with properties of being termite /borer proof. water/moisture proof and fore retardent and fixing on M.S.(mild steel) frame made of 25x25x1.5 mm square hloow box section including a priming coat of approved steel primer, placed at grid made at 1.0x1.0 m or as per requirement at site with necessary stainless steel fastener and SS screws etc., all complete as per direction of Engineer-in- charge. (Note : M.S (mild steel) framework with priming coat and necessary fattener shall be paid separately.	321	sqm	3912.89	1256038
	SUB HEAD TOTAL=				**7295611**
		Total Part-B			**790404160**
		Grand Total			**805265440**