

**DEMOLITION & RE-CONSTRUCTION OF
RESIDENTIAL QUARTERS AT SALAKATI,
AIZAWL, JIRIBAM, HAFLONG & KUMARGHAT
UNDER O&M ADD CAP-2019-24**

TECHNICAL SPECIFICATIONS

**SECTION – 1
CIVIL WORKS**

SECTION 1 - CIVIL

1.0. Introduction:

- a. The intent of this technical specification covers all construction of all civil works as covered in the scope of contract as per drawings supplied by Owner.
- b. All civil works shall be carried out as per design/drawings standardized by the Consultant / Owner and these specification provided by the Consultant / Owner. All standard drawings are enclosed with the tender documents. In case any item is not covered under specification then the same shall be carried out as per CPWD specification and applicable Standards and Codes. Any item for which specification is not provided herein and is not covered under CPWD specification shall be executed as per manufacturer guidelines. All materials shall be of best quality conforming to relevant Indian Standards and Codes. In case of any conflict between Standards/ Code and Technical Specification, the provisions of Technical Specification shall prevail.
- c. The Contractor shall furnish all labour, tools, equipment, materials, temporary works, constructional plant and machinery, fuel supply, transportation and all other incidental items not shown or specified but as may be required for complete performance of the Works in accordance with drawings, specifications and direction of Owner.
- d. All materials including cement, reinforcement steel and structural steel etc. shall be arranged by the Contractor. All testing required shall be arranged by the Contractor at his own cost. The contractor shall execute the work as per the Field Quality Plan (FQP) attached with this document.
- e. The bidder shall fully apprise himself of the prevailing conditions at the proposed site. Climatic conditions including monsoon patterns, local conditions and site specific parameters and shall include for all such conditions and contingent measures in the bid, including those which may not have been specifically brought out in the specifications.

2.0. Schedule Items :

- a. The Items of works considered based on Delhi Schedule of Rates are termed as Schedule Items.
- b. The work shall be executed in accordance with the specification stipulated in the Bill of Quantity and other bidding documents read along with CPWD (Central Public Works Department) specifications-2019 for civil works and IS codes with up to date corrections. For non-schedule items specification as given along with tender document and similar items of CPWD shall be applicable.
- c. The list of references for civil works are CPWD specifications, relevant IS codes and best practices.
- d. All main RCC work shall be of Concrete Mix design of grade M25.
- e. Ordinary Portland cement (OPC-43 Grade) of IS 8112/ IS 12269/ Portland Pozzolana Cement (PPC) of IS 1489(part-1) shall be used for all RCC and other cement works. This will supersede other specifications of cement to be used for the works.

SECTION 1 - CIVIL

- f. For ready mixed cement concrete, in addition to the CPWD specification, the following also to be noted:
 - a) The design mix shall be submitted to Engineer in Charge for approval.
- g. All hard ware fittings shall be of best quality and shall be selected as per the Instructions of Engineer in Charge.
- h. The Polished vitrified tiles shall be laid in floors, borders, skirting as per the instructions of Engineer in charge. The material is to be procured as per the basic cost considered in the BOQ specification with in +/- 5% variation as per the brand and shades decided by the Consultant / Engineer in Charge. The Bills / invoices are to be submitted to POWERGRID.
- i. Minimum grade of Reinforcement steel shall be Fe 550 D.

3.0. NON SCHEDULE ITEMS : The items considered based on market rates of materials & works are termed as Non Schedule Items.

3.1 Diluting and injecting chemical emulsion for POST-CONSTRUCTIONAL anti-termite treatment : Along external wall where the apron is not provided using chemical emulsion @ 7.5 litres / sqm of the vertical surface of the substructure to a depth of 300mm including excavation channel along the wall & rodding etc. complete: With Chlorpyrifos/ Lindane E.C. 20% with 1% concentration

- a) **General:** The anti-termite treatment is a post-constructional method of treatment to be carried out for at different stages of sub-structure construction. The material and methods of application shall be as per IS:6313 (Part-II).
- b) **Material:** : The material shall be Chlorpyrifos/ lindane emulsifiable concentrate of 20%.
- c) **Laying and application:** As per IS :6313 (Part-II)
- d) **Measurement:** Plinth area of the building shall be measured for the purpose of payment.
- e) **Rate:** The rate includes the cost of materials and labour involved in the operations described above.

3.2 Earthwork in excavation and filling in all types of soil and soft / disintegrated rock in open areas/nallahs/channels to the required slopes, shapes, levels, elevation and profile including trimming of bottom and slopes and excavation, Bailing out of water, removal of slush , preparation of embankments/marginal banks, loosening, dressing and spreading of material in layers not exceeding 200 mm as per the direction of E-I-C, water flooding , compacting to achieve 95% consolidation at Optimum moisture content, finishing etc. all complete for all leads and lifts within the levelling boundary including disposal of surplus earth and stacking of unsuitable material within a lead of 1 KM beyond levelling boundary, with all labour, material, tools & tackles and machineries, safeguards and incidentals etc. as necessary as per drawing and instruction of EIC.

SECTION 1 - CIVIL

- a) **General:** The Cutting and filling, levelling and compaction is to be carried out before starting of the foundation work to get a levelled ground. The scope of work will be on the entire area of Township.
 - b) **Levelling & Compaction:** Filling shall be carried out in layers not exceeding 200 mm in thickness, water flooding, compacting to achieve 95% consolidation at Optimum moisture content. 8 T roller or vibro roller of similar impact to be used for compaction.
 - c) **Measurement:** Excavation/ Cutting quantity shall be only measured for payment.
 - d) **Rate :** The rate includes the cost of T&T, machineries and labour involved in the operations described above.
- 3.3 Providing material and labor for fixing of **100x50mm Solid door frame** made of WPC (Wood Polymer Composite -composed of rice husk & thermoplastic single extruded) which should be termite proof ,water proof ,Fire retardant and screwable/ Nailable of Alstone Door frame or equivalent to Hybrid grade ISI marked. Door frame to be of density 720 kgs/cum. cutting rebate, fixing expandable hold fasteners of length 140mm x 10mm of Hilti on C.C./R.C.C./Brick Masonry surface backing including drilling necessary holes and the cost of bolts etc. Rate should include Door frame hard ware and water based paint with necessary , etc. complete .Hardware minimum one number per RM shall be provided.
- a. **General:** The Frame work shall be carried out for Door. The work shall be executed in all types of units. The Frame shall be used where two shutters are coming on the same frame, so will be Double rebated or as per directions of the consultant / Engineer in charge.
 - b. **Material:** The Frame shall WPC (Wood Polymer Composite -composed of rice husk & thermoplastic single extruded) which should be termite proof ,water proof ,Fire retardant and screwable/ Nailable and shall be ISI marked. The frame shall have the (exposed) face polished before being brought to site unless otherwise specified.
 - c. **Preparation of surface and laying:** The frame shall be fixed with 8 nos. 140 mm long, 10 mm dia metal dash fasteners on C.C /Brick Masonry surface of approved brand and manufacture or as per direction of Engineer in charge.
 - d. **Measurement:** The Measurements shall be taken in Meter correct to two decimal places of decimal of the finished area for all types of frame works.
 - e. **Rate:** The rate includes the cost of materials and labour involved in the operations described above.
- 3.4 **Solid Door Frame (WPC) :** Providing material and labor for fixing of **125x50mm Solid door frame** made of WPC (Wood Polymer Composite -composed of rice husk & thermoplastic single extruded) which should be termite proof ,water proof ,Fire retardant and screwable/Nailable of Alstone Door frame or equivalent to Hybrid grade ISI marked. Door frame to be of density 720 kgs/cum. cutting rebate, fixing expandable hold fasteners of length 140mm x 10mm of Hilti on C.C./R.C.C./Brick Masonry surface backing including drilling necessary holes and the cost of bolts etc Rate should include Door frame hard ware and water

SECTION 1 - CIVIL

based paint with necessary , etc. complete. Hardware minimum one number. per RM shall be provided.

- a) General: The Frame work shall be carried out for Doors. The work shall be executed in all units. The Frame shall be used where single shutters is coming on the frame, so will be Single rebated or as per directions of the consultant / Engineer in charge
- b) Material: The Frame shall WPC (Wood Polymer Composite -composed of rice husk & thermoplastic single extruded)) which should be termite proof, water proof, Fire retardant and screwable /Nailable and shall be ISI marked. The frame shall have the (exposed) face polished before being brought to site unless otherwise specified.
- c) Preparation of surface and laying: The frame shall be fixed with 8 nos. 140 mm long, 10 mm dia metal dash fasteners of approved brand and manufacture or as per direction of Engineer in charge.
- d) Measurement: The Measurements shall be taken in Meter correct to two places of decimal of the finished area for all types of frame works.
- e) **Rate:** The rate includes the cost of materials and labour involved in the operations described above.

3.5 Solid Flush door WPC (Wood polymer composite): Providing material and labour for fixing of Solid Flush door made of WPC(Wood Polymer Composite- composed of rice husk & thermoplastic) which should be termite proof, waterproof & screwable of Alstone or equivalent of Hybrid grade with ISI marked, finished with both side 1.00 mm thick high pressure laminate of plain/wood grain in gloss /matt/suede finish including 2nd class teak wood readymade lipping (4mm thick), cutting rebate, fixing over frame with heavy duty stainless steel butt hinges (min. 3 nos. of 125 mm) and screws etc. Rate is inclusive of approved make Door hardware of Stainless steel (316 Grade) comprising of tower bolts and Sliding bolts (250 mm long) on each side, handles (125 mm long on both sides), hanging type double lever floor door stopper with necessary screws, etc. all complete as per approved drawing.

- a) General: 35/30 thick WPC boards non decorative type Core of Solid Board are generally used for Door shutters and for loft shutters in quarters.
- b) Material: The material should be procured from approved manufacturer and approved colour decided by the Engineer in charge & the material shall be used in Transit camp /D-type. Laminate shall be of the brand, catalogue, surface finish, colour as specified and approved by the Employer. The bonding agent shall be an approved adhesive, used in strict accordance with the manufacturer's instructions. Rubber based adhesives shall in no case be used. Minimum 4mm thk 2nd class teak wood beading/ lipping shall be used to protect the board & laminate at the edges and will be fixed with adhesive and nails. The beading/ lipping shall be manual/machine French polished.

SECTION 1 - CIVIL

- c) Measurement: The item shall be measured in Sqm.
 - d) Rate: The rate shall include the cost of commercial board, laminates, teak wood supports, teak wood beading with French polishing and all required fixtures etc, and all labour charges for fixing as described in BOQ to complete the work.
- 3.6 Providing and fixing **12 mm thick WPC Board** (Wood Polymer Composite- composed of rice husk & thermoplastic) which should be termite proof, waterproof & screwable & nailable of Alstone or equivalent of Hybrid grade ISI marked in fabrication of Display-cum-Storage System, cupboards in rooms i/c Drawers, shelves, etc. with teak wood lipping on the edges of the shutters and the box etc. complete as per directions of engineer-in-charge and approved drawing. (Door handle, lock, channel and Hinges to be paid separately). (Area of the board with lipping to be measured).
- a) General: **12** thick WPC boards non decorative type Core of block boards are generally used for wardrobes /cup boards and for loft shutters etc. in all quarters.
 - b) Material: The material should be procured from approved manufacturer and approved colour decided by the Engineer in charge. Minimum 4mm thk 2nd class teak wood beading/ lipping shall be used to protect the board & laminate at the edges and will be fixed with adhesive and nails. The beading/ lipping shall be manual/machine French polished.
 - c) Measurement: The item shall be measured in Sqm.
 - d) Rate: The rate includes the cost of materials, screws and labour involved in the operations described above.
- 3.7 Providing and fixing **18 mm thick WPC Board** (Wood Polymer Composite- composed of rice husk & thermoplastic) which should be termite proof, waterproof & screwable & nailable of Alstone or equivalent of Hybrid grade ISI marked in fabrication of Display-cum-Storage System, cupboards in rooms i/c Drawers, shelves, etc. with teak wood lipping on the edges of the shutters and the box etc. complete as per directions of engineer-in-charge and approved drawing. (Door handle, lock, channel and Hinges to be paid separately). (Area of the board with lipping to be measured).
- a) General: **18** thick WPC boards non decorative type. Core of block boards are generally used for drawers and internal partition of the wardrobes/ cupboards/ loft in all units.
 - b) Material: The material should be procured from approved manufacturer and approved colour decided by the Engineer in charge.
 - c) Measurement: The item shall be measured in Sqm.
 - d) Rate: The rate includes the cost of materials, screws and labour involved in the operations described above.
- 3.8 Providing & fixing **6mm thick WPC Board** (Wood Polymer Composite- composed of rice husk & thermoplastic) which should be termite proof, waterproof & screwable/ nailable of

SECTION 1 - CIVIL

Alstone or equivalent of Hybrid grade ISI marked for backing of cupboard/ plain lining / cladding with necessary S.S. Screws, complete as per direction of Engineer-In- Charge.

- a) General: 6 mm thick WPC boards non decorative type. Core of block boards are generally used for ward robes/cup boards and for loft shutters in all quarters.
- b) Material: The material should be procured from approved manufacturer and approved colour decided by the Engineer in charge.
- c) Measurement: The item shall be measured in Sqm.
- d) Rate: The rate includes the cost of materials and labour involved in the operations described above.

3.9 Providing and fixing magnetic catcher in cupboard/ward robe shutters including fixing with necessary Stainless Steel screws etc. complete (Best make of approved quality). (a) Double strip (horizontal type).

- a) General: To be used on the shutters of Wardrobe/ Cupboard/ Loft/ Kitchen cabinets/ Showcase etc. in all quarters.
- b) Material: The product should be Double strip (horizontal type) made up of SS/ brass material and should be procured from approved manufacturer as decided by the Engineer in charge.
- c) Measurement: The item shall be measured in nos.
- d) Rate: The rate includes the cost of materials and labour involved in the operations described above.

3.10 Providing and fixing of Un-plasticized High density Poly Vinyl Chloride (UPVC) 3 track sliding Door/ Window with mesh shutter – (2-glass shutter and 1-mesh shutter) duly manufactured using UPVC reinforced profiles (Composition of profile shall consists a minimum of 5.5 PHR of TiO₂ and not more than 12 PHR of CaCo₃ for every 100 parts of PVC resin) of (108 mm x 45 mm) x 2.20 mm for outer frames, (39 mm x 58 mm) x 2.20mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.0/1.2 mm prefabricated & welded through fusion welding. The window sash shall be fitted with 5 mm thick clear Toughened glass of reputed make (Make: saint Gobain) and mesh shutter frame shall be (30 mm x 48.5 mm) x 2.0 mm fitted with Vinyl Coated Fibre mesh- on rollers/ pulley duly fixed with Grey colour TPV Gasket for sash & Glazing bead shall be co-extruded with Grey colour soft PVC. Stainless steel (grade 304) wire gauze of 0.5 mm dia wire and 1.4 mm aperture on both sides Window shall be provided with standard hardware & Single point locking system of touch Lock system. the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site complete for finished item of work. (Make: Finesta, Aparna, Adopen)

- a) General: The item shall be operated as entry door to all Living/ rear balconies in all quarters except the entry to utility area from kitchen.

SECTION 1 - CIVIL

- b) Material: Unplasticised High density Poly Vinyl Chloride (UPVC) 3 track sliding Door/ Window with mesh shutter – (2-glass shutter and 1-mesh shutter) duly manufactured using UPVC reinforced profiles (Composition of profile shall consists a minimum of 5.5 PHR of TiO₂ and not more than 12 PHR of CaCo₃ for every 100 parts of PVC resin) of (108 mm x 45 mm) x 2.20 mm for outer frames, (39 mm x 58 mm) x 2.20mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.0/1.2 mm prefabricated & welded through fusion welding. The window sash shall be fitted with 5 mm thick clear Toughened glass of reputed make and mesh shutter frame shall be (30 mm x 48.5 mm) x 2.0 mm fitted with Vinyl Coated Fibre mesh- on rollers/ pulley duly fixed with Grey colour TPV Gasket for sash & Glazing bead shall be co-extruded with Grey colour soft PVC. Stainless steel (grade 304) wire gauze of 0.5 mm dia wire and 1.4 mm aperture on both sides Window shall be provided with standard hardware & Single point locking system of touch Lock system. the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/deglazing at site etc. The material shall be of approved make as per the instruction of EIC (Make: Finesta, Aparna, Adopen).
- c) Measurement: The item shall be measured in Sqm and front face area shall be measured for Payment.
- d) Rate: The rate includes the cost of materials including all materials and labour involved in the operations as described above and as per instruction of EIC.
- 3.11 **S.S Railing with Midrails:** - Supply and installation component (Weld free) based system of stain finish stainless steel AISI 304 SS handrail and balustrade system having 38mm dia tube handrail (1.5mm gauge) connected with unified stem keys in bead blasted finish to Ø 38 mm AISI 304 Grade S.S Top Mounted Round Baluster with Accessories (Wall thickness 1.5 mm)to be fixed on the side of staircase (2-point fixed) with infill of 3 horizontal midrails of Ø 16 mm AISI 304 Grade S.S Horizontal Members(Three)(Wall thickness 1.5 mm) [Non- Continue with circular solid bosses of 50 mm dia at max c/c distance of 1800mm with anchor fasteners to the wall complete with all necessary bends and termination. Height of railing will be 900-1000 mm. (Staircase & balcony)
- a) General: Weld free based system of Satin finish stainless steel AISI 304 SS handrail and balustrade system and procured from the approved manufacturer. It shall be without any dents, waviness, scratches, stains etc. the item shall be used in Staircase and Balconies.
- b) Material: The material should be of High exterior grade stainless steel AISI 304 SS procured from approved manufacturer decided by the Engineer in charge. The material to be tested before use.
- c) Measurement: The item shall be measured in Kg.
- d) Rate: The rate includes the cost of all materials and labour involved in the operations described above to complete the work.

SECTION 1 - CIVIL

- 3.12 Providing and fixing chromium plated brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete. (Arch,Dline,Ozone,GodrejKich Make)
- a) General: Mortice Lever Handle to be used on the Main entrance door in all quarters.
 - b) Measurement: The item shall be measured in numbers all including handle and lock.
 - c) Rate: The rate includes the cost of materials and labour involved in the operations described above.
- 3.13 Providing and fixing **Cabinet & Drawer Handle (SS 304 Grade)**with necessary SS screws complete as per direction of Engineer in charge of size **10mm x 224 mm** (Arch,Dline,Ozone,GodrejKich Make)
- a) General: To be used on Kitchen Cabinet and cupboards/ wardrobes (SS 304 Grade)
 - b) Material: Handles shall be made of 304 grade SS and size 10mm x 224 mm and should be procured from approved manufacturer decided by the Engineer in charge .
 - c) Measurement: The item shall be measured in numbers.
 - d) Rate: The rate includes the cost of materials and labour involved in the operations described above.
- 3.14 Providing and fixing GI plaster mesh (Arpita or equivalent) made out of galvanized iron of nominal thickness 0.35mm with a zinc coating of 120 gms per sqm along the junctions of masonry and concrete works including fixing, scaffolding, lead and lifts etc. as per the directions of the Engineer in Charge.
- a) General: GI plaster mesh (Arpita or equivalent) to be provided on the junction of walls with beams and column in all quarters and common areas.
 - b) Material: The material should be procured from approved manufacturer decided by the Engineer in charge. GI wire mesh of 0.35mm thickness with zinc costing of 120 grams shall be provided.
 - c) Fixing: The mesh shall be fixed to different surfaces before plaster with the help of screws and nails at Masonry and column/beam junctions. If required drilling can be done. A min of 75mm width shall be provided on either side of the joint. A min of 15cm shall be over lapped where ever mesh is joined. The mesh shall be fixed in such way that it should be concealed in the plaster.
 - d) Measurement: The item shall be measured in sqm.
 - e) Rate: The rate includes the cost of materials and labour involved in the operations described above
- 3.15 Supply and installation of kitchen chimney Signia 60 cm auto-clean function and a chimney with 60 cm auto-clean technology with 1200 suction capacity of Kutchina or equivalent all complete as per instruction of EIC.

SECTION 1 - CIVIL

- a) **(i) Finish:** Black, **(ii) Size:** 60cm **(iii) Suction:** 1200m³/hr **(iv) Auto-Clean Type:** 3rd generation Dry Auto-Clean **(v) Switch Control:** Touch Control **(vi) No of speed control:** 3 **(vii) Filter type:** BaffleFilter **(viii) Illumination Type:** LED **(ix) Voltage/ Freequency:** 220/240V–50Hz **(x) Noise Level:** 58DB **(xi) DuctDiameter:** 150mm **(xii) Keypoints:** Multi Speed Wave Sensor / 3rd generation Dry Auto-Clean / Touch Interface / life time warranty on motor/1yearWarrantyonProduct **(xiii) Product Dimension:** 596 x 381 x 497mm **(xiv) Gross Weight:** 14.2kg **(xv) Net weight (kg):** 12.3kg

4 GENERAL

- 4.1 Double pipe scaffolding shall be used for all the works and as per industry best practices.
- 4.2 Where equivalent is indicated, it shall mean material with equivalent quality with the vendors indicated. In case it is not possible to identify similar materials with other vendors, the material shall be selected based on equivalent cost with in identified Vendors as per manufacturers price catalogs.
- 4.3 **Drawings**
- 4.3.1 Tender drawings developed by the consultant / owner are enclosed with the tender documents. These are indicative. Upon placement of award, 2 sets of the drawings, with a “RELEASED FOR CONSTRUCTION” stamp, shall be issued by the Owner to the Contractor matching with the requirement at Site. The Contractor shall execute the work at Site as per these drawings only.
- 4.3.2 The Drawings shall be made available to the Contractor sequentially as per the agreed work schedule.
- 4.4 **Approved Vendors:** List of approved vendors is enclosed to the specification.
- 4.5 **Field Quality Program:**
- 4.5.1 The work shall be executed as per the Standard Field Quality Document No. C/FQA/SFQP/SITE-CIVIL-2012/REV-04 pertaining to building civil works along with the other quality plans indicated in the Technical specifications. All tests on materials and finished products as required in field quality plan shall be carried out by the Contractor at his own cost. The following guide lines shall govern for carrying various lab tests:
- 4.5.2 The material testing shall be carried out in any of the NABL accredited laboratories/ Approved TPL of POWERGRID NER:
- 4.5.3 In case Testing facilities are not available for any specified test given in FQP/Tech Spec/BOQ item Description in these laboratories, the same shall be carried out in any other laboratory where such facilities are available with the specific approval of Engineer in Charge.
- 4.5.4 The contractor shall arrange at his own cost, packing, forwarding and other incidentals for conducting the tests.

SECTION 1 - CIVIL

- 4.5.5 All test reports shall be submitted to POWERGRID within 7 days from the date of dispatch of test specimens to the laboratory.
- 4.6 The Contractor shall bring samples of all materials; finished or raw to the site and shall get them approved from the Engineer-in-Charge before using them in the work. Any material not conforming to approved samples shall be removed within 48 hours of the Engineer-in-Charge's instruction to the Contractor to do so, failing which it shall be removed by the Engineer-in-Charge or his representative from the site at the risk and cost of the Contractor.
- 4.7 Samples of materials to be used with original/colour catalogue with specification shall be brought by contractor well in advance and shall be displayed and kept in separate sample room in site. Samples of all kinds of materials to be used shall require approval of the Owner.
- 4.8 Materials shall be of approved quality and the best of their kind available and shall generally conform to I.S. Specifications. The Contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials are on site well ahead of requirement for use in the work. The work involved calls for high standard of workmanship combined with speed and to the entire satisfaction of the Engineer in Charge.
- 4.9 Before placement of award for supply & installation of equipment, materials. the contractor shall submit a proposal furnishing all the catalogs & specifications for approval of the Engineer in charge, well in advance
- 4.10 The work shall be executed at all levels unless otherwise specified.
