

**SPECIFICATIONS OF UN HOUSE REPAIR AND MAINTENENCE
(CIVIL) WORKS**

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1. General

The Work shall be carried out according to these Specifications whether specifically mentioned elsewhere or not. No extra in any form will be paid unless it is definitely stated as an item in the Bill of Quantities.

Whenever the Specifications are not given or when the Specifications are ambiguous, the relevant Nepal Standards or Indian Standards and further amendments will be considered as final and binding.

All Works shall be carried out simultaneously with in co-operation with the Contractors of the above services. The Work shall be carried on till it is completed satisfactorily along with the completion of other essential services. The Contractor shall keep the other Contractors informed of the proposed program of Work, well in advance, so that the maintenance Work is not hindered. The Contractor shall further cooperate with other Contractors in respect of any facility required by them e.g. making holes in shuttering for sanitary, pipes, electric conduits, fan hook etc. However, no extra payment shall be admissible for such reasonable assistance and facilities afforded to other Contractors and the Contractors shall be deemed to have taken these factors into consideration while quoting the rates.

The Work shall be related to the drawings which the Contractor is presumed to have studied. Nothing extra will be paid for any item because of its shape, location or other difficult circumstances, even if the schedule makes no distinction, as long as the item is shown in the drawings.

The sources of materials stated in the Specifications are those from which materials are generally available. However, materials not conforming to Specifications shall be rejected even if they come from the stated sources. The Contractor should satisfy himself that sufficient quantity of materials of acceptable Specification is available from the stated or other sources. The requirements of Specifications shall be fulfilled by the Contractor without extra charges i.e. the item rates quoted shall be deemed to have taken these Specifications into account. These are requirements the Contractor shall fulfil after the issue of Letter of Acceptance but before the Date of Commencement.

1.1 Definitions

General:

Acceptable/Approved (Approval) - Acceptable to/approved by the Engineer.

Agreed - Agreed in writing.

As detailed - As detailed on the drawings.

Authorized/ordered/rejected - Authorized/ordered/rejected by the Engineer.

Designated - Shown on the drawings or otherwise specified by the Engineer or, in relation to an item scheduled in the bid documents, descriptive of an item to be priced by a bidder.

Indicated - Indicated in or reasonably to be inferred from the contract, or indicated in writing by the Engineer.

Instructed/directed/permitted - Instructed/directed/ permitted by the Engineer.

Satisfactory - Capable of fulfilling or having fulfilled the intended function.

Service - Any pipeline, cable, duct etc. for conveying or transmitting any fluid or other matter.

Submitted - Submitted with the tender or submitted to the Engineer, as appropriate.

Tolerances:

Deviation - The difference between the actual (i.e., measured) size or position and the specified size or position.

Permissible deviation - The specified limit(s) of deviation.

Tolerance - The range between the limits within which a size or position must lie. Measurement and Payment:

Bill/schedule - The bill/schedule of quantities.

Billed/scheduled rate - The unit rate or price entered in the bill/schedule at which the Contractor undertakes to execute the particular work or to provide the required material, article or service, or to do any or all of these things, as set out in the item concerned.

Billed/scheduled - Listed in the bill/schedule of quantities.

Fixed charge - A charge for work that is executed without reference to time.

Method-related charge - The sum for an item inserted in the bill by the Contractor when tendering, to cover items of work relating to his intended method of executing the Works.

Time-related charge - A charge for work the cost of which, to the Employer, is varied in proportion to the length of time taken to execute the particular item scheduled.

Value-related charge - A charge that is directly proportional to the value of the contract.

2. Safety Measures

- The Contractor shall be responsible for safety of all workmen and other persons entering the Works and shall at his own expense; where not stated otherwise take all measures, subject to the Engineer's approval, necessary to ensure their safety. Such measures shall include but not be limited to:
- Provision of safety and emergency regulations for fire, gas, and electric shock prevention, together with rescue operation plan
- Safe control of flowing water
- Provision and maintenance of suitable lighting to provide adequate illumination at place of work with appropriate spares and standby unit
- Provision and maintenance of safe, sound slings, pulleys, ropes, and other lifting device
- Provision of safe access to any part of the works.

The Contractor shall submit a proposal with detailed safety and emergency measures for the Engineer's approval. When the proposal has been approved, English and Nepali version of the regulations shall be made available to all of his Employees and the Engineer. The Contractor shall ensure that all his Employees are fully conversant with the regulations, emergency and rescue procedures etc. and shall enforce a rule that will instantly dismiss any employee committing a serious breach of such regulations.

3. Measurement and Payment

Unless otherwise provided in the contract, no separate measurement and/or payment shall be made for all materials and works required under this clause. All costs in connection with the work specified herein shall be considered to be included with other related items of the work in the BOQ. All provision of temporary services shall be covered by a provisional sum in the BOQ. The lump sum amounts indicated in BOQ shall be paid in pro-rata basis by dividing the total amounts by contract period in months. These payments will be incorporated in the interim certificates for payment.

4. Disposal of Spoil and Construction Waste

Materials in excess of the requirements for permanent works and unsuitable materials shall be disposed off in locations and in the manner as agreed with the Engineer. The locations of disposal sites shall be such as not to promote instability, destruction of properties and public service systems. Exposed areas of such disposal sites shall be suitably dressed and be planted with suitable vegetation. The Contractor shall plan his works in such a way that there is no spillage of POL products to the surface or sub-surface water.

5. Quality of Materials

The materials supplied and used in the works shall comply with the requirements of these Specifications. They shall be new, except as provided elsewhere in the contract or permitted by the Engineer in writing. The materials shall be manufactured, handled and used skillfully to ensure completed works to comply with the contract.

6. Sources of Materials

The use of any one kind or class of material from more than one source is prohibited, except by written permission of the Engineer. Such permission, if granted, shall set forth the conditions under which the change may be made. The sources or kinds of material shall not be changed without written permission of the Engineer. If the product of any source proves unacceptable, the Contractor shall make necessary arrangements for the supply of acceptable material. Any claims for compensation associated with such arrangements or changes shall not be considered, unless the source of the unacceptable material is designated in the contract as a source of material. When any manufactured product, either new or used, is to be furnished by the Employer, the location at which such material shall be delivered to the Contractor shall be designated in the contract. In such cases, the Contractor shall haul the materials from the designated delivery point to the point of use. The compensation for such hauling shall be included in the contract unit rate for placing the materials in the finished work.

7. Soils and Gravels

soils and gravels shall be carried out as specified or as directed by the Engineer. Samples shall be prepared for testing as indicated in IS 2720 part I, except that:

- a) The mass (in g) of a sample required for sieve analysis is about 400D, D being the maximum particle size (mm).
- b) Sample containing particles larger than 19 mm size shall be prepared for compaction and CBR tests as described hereunder, provided the proportion in weight of such particles is less than 30%:

An adequate quantity of representative material shall be sieved over the 50 mm and 19 mm sieve. The material passing the 50 mm sieve and retained on the 19 mm sieve shall be weighed and replaced with an equal mass of material passing the 19 mm sieve and retained on the 4.75 mm sieve. The material for replacement shall be taken from the remaining portion of the main sample. When preparing gravel samples, the aggregations of particles shall be broken with a wooden or rubber hammer or pestle. Care shall be taken that no individual particles are crushed in the operation.

8. Stone, Aggregate and Sand

Sampling and Preparation of Samples

Sampling shall be carried out as per ASTM-D75 and the samples shall be prepared in accordance with IS 2386 or according to sampling procedures specified for the Standard Methods of testing given in following

9. Cement

Ordinary and High Strength Portland Cement (OPC and HSPC), Portland Slag Cement (PSC), Portland Pozzolana Cement (PPC) shall be sampled according to IS 3535 and tested according to IS 4031.

Chemical and physical requirements for Ordinary Portland Cement, High Strength Portland Cement, Portland Slag Cement and Portland Pozzolana Cement shall be in accordance with IS 269, IS 8112, IS 12269, IS 455, IS 1489 respectively. The requirements on their physical characteristics shall be:

10. Concrete

Sampling and testing on concrete shall be carried out in accordance with the standard methods given:

11. Reinforcing Steel

All reinforcement for use in the Works shall be tested in a Laboratory acceptable to the Engineer and two copies of each test certificate shall be supplied to the Engineer. The sampling and frequency of testing shall be as set out in the NS 84-2042 and NS 191-2045. In addition to the testing requirements described above, the Contractor shall carry out additional testing as instructed by the Engineer.

8.15.1. Testing Of Welds

(1) The tests shall be carried out by the methods described in BS 709. The following

12. Concrete Work

12.1. Definitions

Structural concrete is any class of concrete which is used in reinforced, pre-stressed or un-reinforced concrete construction which is subject to stress. Non-structural concrete is composed of materials complying with the Specification but for which no strength requirements are specified and which is used only for filling voids, blinding foundations and similar purposes where it is not subjected to significant stress. A pour refers to the operation of placing concrete into any mould, bay or formwork, etc. and also to the volume which has to be filled. Pours in vertical succession are referred to as lifts.

12.2. Materials for Concrete

(1) General

The Contractor shall submit to the Engineer full details of all materials which he proposes to use for making concrete. No concrete shall be placed in the works until the Engineer has approved the materials of which it is composed. Approved materials shall not thereafter be altered or substituted by other materials without the consent of the Engineer.

(2) Cement

Cement shall be free flowing and free of lumps. It shall be supplied in the manufacturer's sealed unbroken bags or in bulk. Bagged cement shall be transported in vehicles provided with effective means of ensuring that it is protected from the weather. Bulk cement shall be transported in vehicles or in containers built and equipped for the purpose.

Cement in bags shall be stored in a suitable weatherproof structure of which the interior shall be dry and well ventilated at all times. The floor shall be raised above the surrounding ground level not less than 30cm and shall be so constructed that no moisture rises through it.

Each delivery of cement in bags shall be stacked together in one place. The bags shall be closely stacked so as to reduce air circulation with min gap of 500mm from outside wall. If pallets are used, they shall be constructed so that bags are not damaged during handling and stacking. Stack of cement bags shall not exceed 8 bags in height. Different types of cement in bags shall be clearly distinguished by visible markings and shall be stored in separate stacks. Cement from broken bags shall not be used in the works. Cement in bags shall be used in the order in which it is delivered. Bulk cement shall be stored in weather proof silos which shall bear a clear indication of the type of cement contained in them. Different types of cement shall not be mixed in the same silo. The Contractor shall provide sufficient storage capacity on site to ensure that his anticipated program of work is not interrupted due to lack of cement. Cement which has become hardened or lumpy or fails to comply with the Specification in any way shall be removed from the Site. All cement for any one structure shall be from the same source as far as possible. All cement used in the works shall be tested by the manufacturer. The manufacturer shall provide the results of tests as given in following tables for each supply and for the last six months of his production. The Contractor shall supply two copies of each certificate to the Engineer.

(3) Fine Aggregate

Fine aggregate shall be clean hard and durable and shall be natural sand, crushed gravel sand or crushed rock sand complying with IS 383. All the material shall pass through a 4.75 mm IS sieve and the grading shall be in accordance with IS 383. In order to achieve an acceptable grading, it may be necessary to blend materials from more than one source. The deviation from the initial fineness modulus shall be no more than ± 0.30 for ordinary concrete and ± 0.20 for high quality concrete. However, in respect of the presence of deleterious materials the fine aggregate shall not contain iron pyrites, iron oxides, mica, shale, coal or other laminar soft or porous materials or organic matter unless the Contractor can show by comparative tests on finished concrete as per the direction of the Engineer, that the presence of such materials does not affect the properties of the concrete.

(4) Coarse Aggregate

Coarse aggregate shall be clean hard and durable crushed rock, crushed gravel or natural gravel corresponding to the following classes:

Class A: Aggregate shall consist of crushed igneous or quartzite rock from an approved source.

Class B: Aggregate shall consist of crushed quarry rock other than Class A from an approved source.

Class C: Aggregate shall consist of natural or partly crushed gravel, pebbles obtained from an approved gravel deposit. It may contain a quantity of material obtained from crushing the oversize stone in the deposit provided such material is uniformly mixed with the natural uncrushed particles.

Class D: Aggregate shall consist entirely of crushed gravel. The crushed gravel shall be produced from material retained on a standard sieve having an opening at least twice as large as the maximum size of aggregate particle specified.

Class E: Aggregate shall consist of an artificial mixture of any of the above classes of aggregate. The use of Class E aggregate and the relative proportions of the constituent materials shall be approved by the Engineer.

13. Wood Work

Generally, the timber shall be Sal wood unless otherwise stated of the best quality obtained from an approved saw mill. Timber for carpentry shall be straight and free from twist, sapwood, shakes, dead and loose knots, worm holes, other holes, signs of decay and other defects, and seasoned and shall comply with the requirements of IS 883-1994. All the timber shall be seasoned and free from decay, harmful fungi and insect attacks and from any other damage of harmful nature which will affect the strength, durability, appearance or its usefulness for the purpose for which it is required. The minimum compressive strength of the timber shall be 70 kg/cm².

14. Mild Steel Works

All poles shall be fabricated from mild steel or high tensile steel manufactured by an approved process. Both mild steel and high tensile steel shall be to Grades 250 (or 300), 350 and 450 in accordance with AS 3678 and AS 3679. The steel shall be in all cases free from blisters, scale, laminations or any other defects.

Cutting, Drilling, Deformation and Punching of Members All members shall be carefully cut and holes accurately located so that when members are in position the holes will be truly opposite each other before being bolted. Holes in material having a thickness exceeding 15 mm or exceeding the diameter of the holes shall be drilled, other holes may be punched. The diameter of the hole, measured before galvanizing, shall not exceed that of the bolt by more than 2.0 mm except where otherwise specified. In addition, the diameter of the die used in the punching machine shall exceed the diameter of the punch by the minimum practical amount so as to avoid excessive hole taper and consequent heavy bearing stress on the bolt shank. In no case shall the punch die exceed the punch diameter by more than 12.5%.

All welding shall be carried out by qualified welders experienced in the type of work covered by this Specification and under the supervision of the Contractor's Welding Supervisors satisfying the requirements of AS 1554 Part 1.

The Superintendent reserves the right to request welder qualification tests at any time or withdraw approval of any welder whose work, in the opinion of the Superintendent, is unsatisfactory. All costs of welder qualification tests and re-tests shall be at the Contractor's expense.

The surface of all welds shall be smooth and free from sharp contour changes. The Contractor shall remove all burrs and sharp edges from all steelwork before galvanizing. Welded end plates and contacting surfaces of parts to be bolted shall be free from distortion which would prevent the connecting faces from being in full contact when bolted.

15. DETAILED SPECIFICATIONS OF WORKS (CIVIL)

Items	Particular	Detail Specifications
	General	<p>All material from site clearance shall be the property of the Employer and depending on its nature shall, as directed by the Engineer, be either</p> <ol style="list-style-type: none"> a. Stockpiled for future reuse. b. disposed by controlled burning. c. disposed by tipping or side casting with all lift within 30m. <p>Measurement Clearing and grubbing executed as per this Specification shall be measured in square meter. Cutting trees including removal of stumps and their roots and backfilling to required compaction shall be measured in number. For this purpose girth shall be measured at a height 1 meter above ground. Cutting of trees up to 300 mm girth including removal of stumps and roots and backfilling of holes with compaction shall not be measured separately.</p> <p>Payment Clearing and grubbing and cutting trees shall be paid at their respective contract unit rates which shall be the full and the final compensation to the Contractor. The contract unit rate for cutting of trees of girth above 300 mm shall also include handling, salvaging, piling and disposing off the cleared materials with all leads and lifts.</p>
15.A Masonry Works		
	General	<p>Mortar Mortar shall comply with IS 2250-1981; Code of Practice for preparation and use of masonry mortar. The mortar used in work shall have the strength not less than 5 N/mm² or 7.5 N/mm² at 28 days as specified. However, if provided in the Contract, cement and sand may also be mixed in specified proportions. Cement shall be proportioned only by weight, by taking its unit weight as 1.44 ton per cubic meter and sand shall be proportioned by volume after making due allowance for bulking.</p>

		<p>Mixing The mixing shall be done in a mechanical mixer unless hand-mixing is permitted by the Engineer. If hand-mixing is allowed, the operation shall be carried out on a clear watertight platform. in the required proportion cement and sand shall be first mixed dry to obtain an uniform colour. Then required quantity of water shall be added and the mortar shall be mixed to produce workable consistency. The mortar shall be mixed for at least three minutes after addition of water in the case of mechanical mixing. In the case of hand mixing, the mortal shall be hoed back and forth for about 10 minutes after addition of water in order to obtain uniform consistency.</p> <p>Only that quantity of mortar shall be mixed at a time which can be used completely before it becomes unworkable. Any mortar that has become unworkable due to loss of water before elapsing the initial setting time of cement shall be rewet to make it workable and shall be used in the works. On no account mortar shall be used after elapsing the initial setting time of cement.</p> <p>Soaking of Bricks Bricks shall be soaked in water for a minimum period of one hour before use. When bricks are soaked they shall be removed from the tank sufficiently in advance so that at the time of laying they are skin dry. Such soaked bricks shall be stacked on a clean place where they are not spoilt by dirt, earth, etc.</p> <p>Laying Brickwork The brick shall be built in English bond with upwards facing frog in case of 230mm thick brickwork (for chimney made and fair faced machine made bricks both).</p> <p>The brick shall be built in running stretcher bond with upwards facing frog in case of half brick wall (for chimney made, traditional dachi appa brickwork and machine made both).</p> <p>Each brick shall be set with bed and vertical joints filled thoroughly with mortar. Selected bricks shall be used for the exposed brickwork as specified under 7.1.2. The walls shall be taken up truly plumb. All courses shall be laid truly horizontal and vertical joints shall be truly vertical. Vertical joints in alternate course shall come directly over the other. The thickness of brick courses shall be kept uniform and for this purpose, wooden straight edge with graduation giving thickness of each brick course including joint shall be used.</p> <p>Necessary tools comprising of wooden straight edge, mason’s sprit level, square, foot rule, plumb, line and pins etc. shall be frequently and fully used by the masons to ensure that the walls are taken up true to plumb, line and levels.</p> <p>Both the faces of walls of thickness greater than 23cm shall be kept in proper plane. All the connected brickwork shall be carried up nearly at one level and no partition of work shall be raised more than one meter above the rest of the work. Any dislodged brick shall be removed and reset in fresh mortar.</p> <p>Before commencing any brickwork, the Contractor shall confer with other trades to ensure that all pipes, conduits, drains, sleeves, bolts, hangers, or any other materials necessary to be installed in the</p>
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		<p>brickwork at the time it is built, have been fixed or provided for.</p> <p>Joints Bricks shall be laid that all joints are full of mortar. The thickness of joints shall be not more than 10mm. The face joints shall be raked to a minimum depth of 7mm by a raking tool during the progress of the work when the mortar is still green, so as to provide proper key for the plaster or pointing to be done. Where plastering pointing is not to be done, the joints shall be struck flush and finished at the time of laying. The face of brickwork shall be kept cleaned and mortar dropping removed.</p> <p>Curing Green work shall be protected from rain by suitable covering. Masonry work in cement mortar shall be kept constantly moist on all faces for a minimum period of seven days. The top of the masonry work shall be left flooded with water so as not to disturb or washout the green mortar. During hot weather, all finished or partly completed work shall be covered or wetted in such a manner as to prevent rapid drying of the brick work.</p> <p>Scaffolding The scaffolding shall be sound and strong to withstand all loads likely to come upon it. The holes which provide resting space for horizontal members shall not be left in masonry under one-meter in width or immediately near the skew backs of arches. The hole's left in the masonry work for supporting the scaffolding shall be filled and made good.</p> <p>Condition of Equipment All equipment used for mixing or transporting mortar and bricks shall be clean and free from set mortar, dirt or other injurious foreign substances.</p>
A1	Chimney made Bricks	<p>The Brick shall be first class chimney made bricks of quality approved by the Engineer and free from grit and other impurities such as lime, iron and other deleterious salts, conforming NS 1 2035 / IS code (latest revision). These shall be well burnt, sound, and hard with sharp edges and shall emit ringing sound when struck with a mallet. These shall be of uniform size. The size of the bricks shall be 22.9cm x 11.2cm x 5.5cm unless otherwise specified, with a tolerance of ± 3mm in each direction The compressive strength should be 3.5N/mm². The bricks shall be provided with frogs</p>
15. B Concrete Works		
		<p>Mixing Concrete Before any batching, mixing, transporting, placing, compacting and finishing and curing the concrete ordered or delivered to site, the Contractor shall submit to the Engineer full details including Drawing of all the plant which he proposes to use and the arrangements he proposes to make. Concrete for the works shall be batched and mixed in one or more plants or concrete mixer unless the Engineer agrees to some other</p>

	General	<p>arrangement. If concrete mixers are used, there shall be sufficient number of mixtures including stand by mixers.</p> <p>Batching and mixing plants shall be complying with the requirements of IS 1791 and capable of producing a uniform distribution of the ingredients throughout the mass. Truck mixers shall comply with the requirements of IS 4925 and shall only be used with the prior approval of the Engineer. If the plant proposed by the Contractor does not fall within the scope of IS 1791 it shall have been tested in accordance with IS 4634 and shall have a mixing performance within the limits of IS 1791.</p> <p>All mixing operations shall be under the control of an experienced supervisor.</p>
B1	Non-structural Concrete	<p>on-structural concrete (NS concrete) shall be used only for non structural purposes where shown on the Drawing.</p> <p>NS concrete shall be compound of ordinary Portland cement and aggregates complying with this Specification.</p> <p>The weight of cement mixed with 0.3 cubic meters of combined aggregate shall not be less than 50 kg. The mix shall be proportioned by weight or by volume. The maximum aggregate size shall be 40 mm nominal.</p> <p>The concrete shall be mixed by machine or by hand to a uniform colour and consistency before placing. The quantity of water used shall not exceed that required to produce a concrete with sufficient workability to be placed and compacted where required.</p> <p>The concrete shall be compacted by hand towels or rammers or by mechanical vibration.</p>
B2	Reinforcement	<p>Reinforcement as plain bars and deformed bars and steel fabric shall comply with the following Indian Standards.</p> <p>IS 1786 for high strength deformed steel bars and wires.</p> <p>IS 1566 for steel mesh fabric.</p> <p>IS 432 mild steel and medium tensile steel bars.</p> <p>All reinforcement shall be from an approved manufacturer and, if required by the Engineer, the Contractor shall submit the ISI certification mark or other test certificate from the manufacturer acceptable to the Engineer. The Contractor shall furnish all information as manufacturer's certificate, invoice, and other relevant details to ensure the quality of steel.</p> <p>The reinforcements shall have no crack, scale or rust or foreign particles that will destroy or reduce the bond. The bars shall be accurately bent and formed to the dimension indicated in the Drawings. The Contractor shall prepare bending schedules for each structure and calculate the weight of the reinforcement. The schedule of bars and the calculations shall be submitted to the Engineer for approval.</p> <p>Binding wire used to bind reinforcements shall be annealed galvanized binding wire of 20 gauges.</p> <p>The sampling and frequency of testing shall be as set out in the NS 84-2042 and NS 191-2045. All reinforcement not complying with the Specification shall be removed from site.</p>

15. C Formworks																				
C1		<p>Construction of Formwork Joints in formwork for exposed faces shall, unless otherwise specified, be evenly spaced and horizontal or vertical and shall be continuous in a regular pattern. All joints in formwork shall be water tight. Where reinforcement projects through formwork, the form shall fit closely round the bars. Formwork shall be so designed that it may be easily removed from the work without damage to the faces of the concrete. It shall also incorporate provisions for making minor adjustments in position, if required, to ensure the correct location of concrete faces. Due allowance shall be made in the position of all formwork for movement</p>																		
		<p>Removal of Formwork The Contractor shall give 24 hours' notice of his intentions to strike any form works. Forms shall be removed without shock vibrations or other damage to the concrete. Formwork shall be carefully removed without shock or disturbance to the concrete. No formwork shall be removed until the concrete has gained sufficient strength to withstand any stresses safely to which it may thereby be subjected. The minimum periods which shall elapse between completion of placing concrete and removal of forms are given in Table and apply to ambient temperatures higher than 10°C. At lower temperatures or if cement other than ordinary Portland are involved, the Engineer may instruct longer periods. Alternatively, formwork ma</p> <p>Minimum Time for Form works</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Form Works</th> <th style="width: 25%;">Normal weather (Days)</th> <th style="width: 25%;">Cold Weather (days)</th> </tr> </thead> <tbody> <tr> <td>1. Vertical or near vertical faces of mass concrete</td> <td>24 hours</td> <td></td> </tr> <tr> <td>2. Beam sides, walls and unloaded columns</td> <td>48 hours</td> <td>1.5 days</td> </tr> <tr> <td>3. Sofits of slabs and beams</td> <td></td> <td></td> </tr> <tr> <td>Spans up to 3m</td> <td>4 days</td> <td>7 days</td> </tr> <tr> <td>Spans over 3m to 6m</td> <td>11 days</td> <td>17 days</td> </tr> </tbody> </table> <p>Measurement Except as stated below, formwork shall be measured in square meter of formwork actually in contact with the finished face of the concrete. No deduction shall be made in the measurement for openings, pipes, ducts and the like, provided that the area of each is less than 0.50 square meters. Unless otherwise stated, if the volume or area of concrete has not been deducted when measuring the concrete, formwork to form box or the void shall not be measured. Formwork required for lean concrete, to form construction joints and</p>	Form Works	Normal weather (Days)	Cold Weather (days)	1. Vertical or near vertical faces of mass concrete	24 hours		2. Beam sides, walls and unloaded columns	48 hours	1.5 days	3. Sofits of slabs and beams			Spans up to 3m	4 days	7 days	Spans over 3m to 6m	11 days	17 days
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		<p>shear keys for future concrete and other construction surfaces shall not be measured and the costs shall be included in the rates for other work.</p> <p>Formwork to contraction and expansion joints shall be measured in square meter on one face only. The rates shall include for the costs stated below and for forming recesses for sealant and channels for grout.</p> <p>The measurement of formwork is inclusive of the measurement for formwork finished surface, shoring, staging, scaffolding and other accessories required for erection and removal of the formwork.</p> <p>Payment</p> <p>The formwork shall be paid as per the contract unit rate. The rates for formwork shall include the cost of submission of details, transportation and use of all materials for formwork, erection including provision of supports, fillets and chamfers 75 mm and less in width, bolts, ties, fixings, cutting to waste, drilling or notching the formwork for reinforcement where required, working around pipes, ducts, conduits and water stops, temporary openings, cleaning, dressing, removal of formwork, filling bolt holes and any remedial work including all incidental works required to complete the work as per Specification. The payment for unformed surfaces of concrete shall be deemed included in the contract unit rate of the relevant concrete.</p>
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15. D Roofing Works

<p>D1</p>	<p>UPVC Roofing</p>	<p>Polyvinyl chloride Resin suspension grade is the basic raw material for forming PVC compound. PVC resin then is mixed with chemicals like Calcium, Stearate, Hydrocarbon Wax, Titanium Dioxide, Calcium Carbonate, and Acrylic processing aids. Further, additives like impact modifiers, pigments, epoxy plasticizer, UV stabilizer, lubricants, chemical blowing agent etc. are added. The purpose of adding the chemicals and additives is to impart cellular structure, strength, surface finish, colour and resistance to fading by light rays. These chemicals are mixed in the desired proportion and shall be used in the formulation of PVC material and for free and smooth extrusion of PVC profiles. The Upvc work as scheduled and detailed shall be fabricated as per the Drawings. Fabricated Upvc work covered by this specification Detailed Specifications of Building Works (Civil) Page 91 shall be supplied and installed by the well-known local Upvc fabricators or manufacturer as approved by the Engineer. Before placing any orders, the Contractor shall state the name of the window manufacturer he has selected from the list of approved manufacturers. The nominated manufacturer shall not be changed without prior approval of the Engineer.</p> <p>Manufacture</p> <p>Upvc work shall be fabricated in accordance with the standard Manufacturer manual and as per the Drawings showing jointing details, hardware and extrusion profiles. It will be the Upvc fabricator's</p>
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		<p>responsibility to ensure that all fabricated Upvc work is carried out in accordance with the Drawings. The frame and the rebate shall be a monolithic unit. All the members shall be free of stains and any damage. If any damage or defects during delivery or after fitting in position are found, the defects shall be rectified immediately or replaced at the Contractor’s expense. The Contractor shall attach all necessary product and quality specification along with the quotation. All the frames and shutters shall be of the same color.</p> <p>The UPVC. roof laminate shall be water and chemical resistant and shall have very high transit strength to weight ratio and high modulus of elasticity, good textile processing and excellent fiber reinforcement properties. The laminate shall have low coefficient of thermal expansion and a high thermal conductivity and high dielectric constants. The F.R.P. laminate shall be diversion ally stable, shall have moisture and corrosion resistance.</p> <p>Tolerance Tolerance of + 10 mm in overall size of UPVC is permissible.</p> <p>Finish The UPVC laminate to be finished with polyurethane based or equivalent paint as final coat or gloss or mat followed by clear lacquer coat to get the shine of required shade.</p> <p>Measurement and Rate The measurement shall be made in square meter. The rate includes cost of all the materials, labor scaffolding, fittings & fixing up to all heights etc. involved in operations described above.</p>
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15. E Door and Windows

<p>E1</p>	<p>Wooden Frame</p>	<p>The contractor is to clear out and destroy or remove all cut and shavings and other wood waste from all parts of the building and the site generally, as the work progress and at the conclusion of the work.</p> <p>Carpentry: All carpentry shall be executed with workmanship of the best quality. Scantling and boarding shall be accurately sawn and shall be of uniform width and thickness throughout. All carpenter’s work shall be left with sawn surface except where particularly specified to be wrought. All carpenter’s work shall be accurately set out in strict accordance with the drawings and shall be framed together and securely fixed in best possible manner with properly made joints. All necessary brads, sheet metal screws, etc. shall be provided as directed and approved. Joinery Bedding Joinery: All door and window frames, sills, wooden bars etc., which are fixed to brickwork, concrete by means of grounds, lugs, etc., shall be bedded solid in mortar as previously described and pointed with a recessed joint 6mm deep to the approval of the Engineer In-charge. Plywood, Block boards, Chipboards and MDF board, shall be bonded with synthetic resin of “interior” type and sheet metal screws unless otherwise stated for the doors. Where stated to be “exterior” type, they shall be weatherproof. Inspection and Testing The Engineer In-charge shall be given facilities for inspection of all</p>
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		<p>works in progress whether in workshop or on site. All timber as it arrives on the site and not approved by them must be removed forthwith, failing which the Employer, with the advice of the Engineer In-charge, may arrange for the removal of the rejects and impose of them as they may consider advisable at the contractor's expenses. Notwithstanding approval having been given as above, any timber incorporated in the works found to be in any way defective before the expiry of the maintenance period shall be removed and renewed at the contractor's expense. The contractor is to allow for testing or prototypes of special construction units and the Engineer In-charge shall be at liberty to select any samples they may require for the purpose of testing i.e. for moisture content, or identification of species, strength, etc.</p> <p>Where timbers need to be extended into a wall, they shall be thoroughly "Brush Treated" with a wood preservative approved by the Engineer In-charge, and as much clear air space maintained around the timber where it adjoins the wall as possible.</p> <p>Measurement Measurement of works will be made in m³ of works as specified.</p> <p>Payment Payment for work will be made on the basis of contract unit price indicated in the BOQ. The payment will be full and final compensation for all material, labour, and equipment to complete the works as specified.</p>
E2	Panelled Shutter	<p>The window shutters may be fully panelled, fully glazed, partly glazed and partly panelled, battened or Venetian as specified. Styles and panels shall be neatly planed and truly finished to exact dimensions. Styles and rails shall be framed properly and accurately with mortise and tenon joints and fixed with bamboo pins as per drawing. Glue shall be applied at all joints before clamping and fixing with bamboo pins. Panels shall be of one piece without any joints and shall be housed with 12.5mm insertion into rails and styles.</p> <p>Panels shall be of thickness as specified in the drawing. All rails above 100mm in width shall have double tenon. No tenon shall exceed 6mm the thickness of the member. In case of swing door, swing door hung in lace shall not be rebated together. It shall be fitted with vision panels.</p> <p>Measurement Measurement of works will be made in m² of works as specified.</p> <p>Payment Payment for work will be made on the basis of contract unit price indicated in the BOQ. The payment will be full and final compensation for all material, labour, and equipment to complete the works as specified.</p>
E3	Glazed, Ply, Teak, GI sheet and Wiremesh shutter	<p>Shutter or frame shall be as described in Panelled doors.</p> <p>Putty: Putty for glazing in wood frames shall be composed of pure linseed oil and whiting powder free from grittiness. Wooden beads All wooden beads shall be from hard wood fitted against the glass. Wooden beads shall be bedded against the rebate and secured by 12.5mm glass nails fixed</p>

		<p>at 75mm apart. The rebate depth shall be 12.5mm Wooden beads shall not project beyond the rebate. All glass panes shall have edge-clearance, when fitted of 1.5mm all round. Beads shall be painted with approved paint before fixing glass pane. Hinges/ handles/bolts/screws: The window shutters shall have minimum of two-piece 100mm steel hinges with steel screws, one aluminum handle and two pieces of 150mm tower bolts of super brand or equivalent with steel screws. The timber louvers shall be 12 mm. thick of the size and fixing as shown in the Drawing. Vertical slats if required shall be provided as per instruction of the Engineer.</p> <p>Measurement Measurement of works will be made in m2 of works as specified.</p> <p>Payment Payment for work will be made on the basis of contract unit price indicated in the BOQ. The payment will be full and final compensation for all material, labor, and equipment to complete the works as specified.</p> <p>Measurement Measurement of works will be made in m2 of works as specified.</p> <p>Payment Payment for work will be made on the basis of contract unit price indicated in the BOQ. The payment will be full and final compensation for all material, labour, and equipment to complete the works as specified.</p> <p>NB:These specifications may be adopted for other type of shutters viz plywood, teak, GI sheet flush doors etc as well. For such items replace glass with relevant material as specified.</p>
E4	MS Roding in Door frame	As specified and instructed by the Engineer-in-Charge and detailed working drawings, if any.
15.F Flooring Works		
F1	Concrete Flooring	<p>Materials: Cement: Portland cement as per specification under “Concrete Work” Aggregate of 12mm nominal gauge shall be properly gauged. Sieving may be insisted upon in which case the contractor shall provide/ supply necessary sieves and labour at his own cost. Sand shall be clean inner bed. Grain distribution shall be same as described under ‘Plastering’.</p> <p>Proportion: The concrete shall be either 1:2:4 mix or 1:4:8 mix or as specified in the drawing. All mix shall be batched by volume except cement, which shall be proportioned by weight and as specified.</p> <p>Mixing: Mixing shall be done on a watertight platform. Material shall be dry mixed after accurately gauging different materials in wooden boxes. The dry mixture shall be turned over thrice (at least) till the colour is uniform and then twice while wet. Water shall be added gradually and no more than necessary to sufficiently wet the materials. Only that much concrete shall be mixed which can be used within half an hour. Each stock of dry mix shall not be larger than consuming one bag of</p>

		<p>cement. In case of machine mixing IS. Code shall be strictly followed and the mixing done under the supervision of the site In-charge.</p> <p>Preparation of Sub-grade The sub-grade shall be cleared of all loose earth, rubbish, and other foreign matter. If necessary the sub-grade shall be cleaned with wire brushes. Cleaned sub-grade shall then be wetted with water thoroughly, but no water pool shall be allowed. Necessary slope shall be given in the sub-grade itself. If the sub-grade is of lean concrete the flooring shall be commenced within 48 hours.</p> <p>Placing Concrete shall be laid in horizontal layers and gently rammed.</p> <p>Finishing It shall be compacted first with wood float. The blows shall be fairly heavy but as consolidation takes place, light rapid strokes shall be given. Beating shall continue till all hollows in concrete are filled with mortar paste. Then the surface shall be trawled till the moisture disappears. The surface shall be checked with straight edge. The surface must be uniform in colour. Immediately after trawling, wellmixed neat cement slurry mixed integrally with hardening liquid 2 litres. to 50kg of cement shall be sprinkled in a uniform layer at the rate of 2.2 kg. per sq.m. The cement slurry shall be trawled smooth with a steel float several times till approved finish is achieved. The surface shall be without the float marks or air holes. Sample of workmanship shall be got to approved prior to work.</p> <p>Curing Curing shall not be commenced until the top layer has hardened. Hardened concrete shall be kept wet for 15 days. Covering with empty cement gunnies shall be avoided, as the colour is likely to be bleached with the remnants of cement matter from the bags</p> <p>Measurement It shall be measured in square meter for specified thickness measured from wall to wall exclusive of any finishing or as per instructions of Engineer. Unless otherwise stated in the schedule of quantities, nothing extra shall be admissible for small areas and corners and work in any shape. No deductions shall however, be made for protruding or independent columns occurring in the floors, door frames embedded in floor or any other part out when the area does not exceed 0.1 m2 for each. However, nothing extra shall be allowed for the cutting involved at such places.</p>
F2	Tiling	<p>Tiles: The tile material for Glazed/Non-glazed Vitrified Porcelain (Granite Viglacera-Vietnam, Portebello- Brazil or equivalent make) / Glazed/Non-glazed Ceramic tiles (Somany, Kajaria or equivalent make), shall confirm to IS:777 (respective IS standards) or Equivalent approved by the Engineer</p> <p>The tiles shall be of approved colour, size and shape or as shown in the drawings. and shall be laid to the pattern approved by the Engineer. The tiles shall be of uniform colour, true to size and shape and free from cracks, twists, uneven edges, crazing and other defects. The size and thickness of the tiles shall be as specified. The contractor shall submit samples of tile for selection and approval by</p>

	<p>the Engineer In-charge and all tiles delivered to the site shall conform to the approved samples with regard to size, quality, texture and colour.</p> <p>Mixing: Mixing shall be done as per specification for mortar mixing of brickmasonry work</p> <p>Preparation of Surface and installation Wall surfaces shall be brushed cleaned and wetted. Prior to installing any tile, the Contractor shall inspect surface and conditions in areas to receive tile work and shall notify the Engineer of any serious defects or conditions that will interfere with or prevent a satisfactory tile installation and shall coordinate with other traders of work. Approximately 12 mm thick level and plumb, scratch coat of cement mortar 1:4 or as specified by site engineer shall be applied. The scratch coat shall be moist cured for at least 24 hours before application of floating coat. Before applying floating coat the scratch coat shall be thoroughly wetted. The floating coat, plastic mix of neat cement of approximately 3 mm thickness shall be applied even with screeds to true plane. Floating coat shall be applied over areas no larger than can be covered with tile while the mortar is still plastic (half set). Glazed tile shall be soaked, completely immersed in clean water at least 30 minutes and drained. Individual tile that exhibits drying along edges shall be allowed to remain on the backs of tile at the time of setting. Tiles shall be installed by applying a skin coat of a plastic mix of neat cement to backs of tile and firmly pressing tile into the floating coat to true plane and position. White cement shall be used for the skin coat where white joints are required. During the process of setting tiles, continuous horizontal and vertical cuts every 40cm to 60 cm shall be made through the floating coat while plastic, using the point of a trowel turned edge wise, Care shall be taken to prevent cutting into the scratch coat. Where full size tile cannot be laid, it shall be cut (sawn) to required size and edges rubbed smooth to ensure a true and straight joint. All tile work finishing shall be adequately protected from damage during the progress of construction and any damage shall be repaired to the satisfaction of the Engineer at the Contractor's expense.</p> <p>Joints in Tile Work Joints in tile work shall be accurately aligned with horizontal joints level and vertical joints plumb. Joints shall be maintained uniformly wide by aligning spacer lugs on tile edges if tiles are so manufactured or by use of wetted strings.</p> <p>Tile Layout Tiles shall be laid out in such a way that no tile less than half size occurs. Where tile must be cut at edges or penetrated the cut edges shall be carefully filed and neatly ground. Chipped, cracked or broken tile shall not be used and all defective work shall be replaced and repaired to the satisfaction of the Engineer at the Contractor's expense.</p> <p>Grouting the Tile Joints After tiles have been set firm and strings removed, the tiles shall be</p>
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		<p>dampened and joints grouted full with a plastic mix of neat cement by trowel, brush or finger application. Unless otherwise directed, grout shall be white cement. During grouting all excess grout shall be cleaned off the tile surface with damp cloth sponges</p> <p>The finished floor surface shall be true to required levels.</p> <p>All tile work finishing shall be adequately protected from damage during the progress of construction till completion and any damage shall be repaired to the satisfaction of the Engineer at the Contractor's expense. Upon completion prior to final inspection and acceptance, the Contractor shall clean all tile work. Acids or agents liable to damage the work shall be avoided. If tile surface show mass scratches, crack or other imperfections, which cannot be removed by cleaning; the Contractor shall remove the defective material and replace with new material at no additional expense. Sample of workmanship and tile grout proposed (silicone) shall be approved prior to execution of work.</p> <p>Measurement</p> <p>The measurement shall be in square meters of the work done including the setting mortar. The rate shall be for the material and labour, all complete.</p>
15.G Plaster and Punning		
G1	General Plaster Works	<p>Plastering shall be started from top and worked down. All putlog holes shall be properly filled in advance of the plastering as the scaffolding is being taken down. Wooden screeds 75 mm wide and of the thickness of the plaster shall be fixed vertically 2.5 to 4 meters apart to act as gauges and guides in applying the plaster. The mortar shall be laid on the wall between the screeds using the plaster's float and pressing the mortar so that the raked joints are properly filled. The plaster shall then be finished off with a wooden straight edge reaching across the screeds. The straight edge shall be worked on the screeds with a small upward and sideways motion 50 mm or 75 mm at a time. Finally, the surface shall be finished off with a plaster's wooden float. Metal floats shall not be used.</p> <p>When recommencing the plastering beyond the work suspended earlier the edges of the old plaster shall be scraped, cleaned and wetted before plaster is applied to the adjacent areas.</p> <p>No portion of the surface shall be left out in a condition to be patched up later on.</p> <p>The plaster shall be finished to a true and plumb surface and to the proper degree of smoothness as required by the Engineer.</p> <p>The average thickness of plaster shall not be less than the specified thickness. The minimum thickness over any portion of the surface shall not be less than the specified thickness minus 3 mm.</p> <p>Any cracks which appear in the surface and all portions, which sound hollow when tapped, or are found to be soft or otherwise defective, shall be cut out in rectangular shape and re-done as directed by the Engineer.</p> <p>Finish</p> <p>Care shall be taken to insure that finished plaster surfaces shall be</p>

		<p>plumb, square, straight and true to line. Generally, all screeds and paving shall be finished smooth, even and truly level (unless specifically required to falls and currents, etc.), and paving shall be steel troweled or floated. Rendering and plastering shall be finished plumb, square, smooth and even. All surfaces to be plastered shall be thoroughly wetted before any plastering is commenced and the Contractor shall allow in his prices for dusting external angles with neat cement to give additional strength. No plastering will be allowed to take place until all chases for service have been cut, services installed and chases made good. On no account may finish plaster surface be chased and made good. All Work shall be to approval and any not complying with the above shall be hacked away and replaced, as directed, and at the Contractor's expense.</p>
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15.H Paint Works

<p>H1</p>	<p>Water cement proof paint works</p>	<p>Cement paint of required colour shall be of ready mixed type in sealed container of approved brand (Snowcem India Ltd., or equivalent brand or manufacture)r conforming to IS: 5410 - latest revision, approved by the engineer in sealed tins, shall be used. Before application of the cement paint the shade shall be approved the Engineer. It shall be procured either in 50 kg. Container or 25 kg. Container. All such container shall have unbroken seal with manufacturer's name and trade marks as well as a description of contents all clearly marked. Such paint shall be mixed and applied strictly in accordance with the manufacturer's instructions and with the approval of site In-charge. All materials shall be stored in dry place. Preparation of Paint Only fresh cement paint shall be used, hard or set paint shall not be used. The container shall be made loose by rolling and shaking the container before opening. Cement paint shall be mixed with water in two stages. First a paste shall be prepared by mixing 2 parts of cement paint powder with one part of water by volume and immediately this shall be thinned by adding another part of water to have uniform solution of consistency of paints. Care shall be taken to add the cement paint gradually to the water and not vice versa. The second stage shall comprise of adding further one part of water to the mix and stirring thoroughly to obtain a liquid of workable and uniform consistency. In all cases the manufacturer's instructions shall be followed meticulously. Cement paint shall be mixed in such quantities as can be used up within an hour of its mixing as otherwise the mixture will set and thicken affecting flow and finish. The lids of cement paint shall be kept tightly closed when not in use, as by exposure to atmosphere the cement paint rapidly becomes air set due to its hygroscopic qualities. Preparation of Surface Before application of paint all dust and foreign materials shall be removed from the surface by use of wire brush. All holes, cracks and</p>
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		<p>abrasion shall be fill with plaster of Paris, properly prepared and applied and smoothed off to match adjoining surfaces. Any loose or uneven areas or any major cracks or defects in the concrete or plaster back ground shall be cut out and made good and the repairs allowed to dry thoroughly. Any efflorescence shall be removed by dry brushing The surface shall be allowed to run off.</p> <p>Application The fresh mixed paint shall be frequently stirred during application and no mixture (paint) shall be used after an hour of mixing. A verticastroke with another horizontal stroke shall be termed one coat.</p> <p>Paint solution shall be applied to the surface with hair brushed/roller in a number of coats to get uniform finish. After the first coat of the paint has hardened, it shall be cured with water at least for 24 hours before the second coat is applied. Similarly required number of coats shall be given to get an even and uniform shade. It shall be kept damp at least for seven days. Sample of workmanship shall be approved by the Engineer prior to commencement of work.</p> <p>The final painted surface shall exhibit uniform and good finished appearance. Measurement shall being square meter of actual covered area. No extra shall be allowed for scaffolding, curing and painting corners, plaster strips etc.</p> <p>Measurement / Payment Measurement shall be in square meters of the actual covered area of the paint. Nothing extra shall be allowed for painting any rough surface e.g. external sand - faced plaster or work in short width or surface in any shape. The rate shall include for two or more coats inclusive of materials, labour, scaffolding all complete</p>
<p>H2</p>	<p>Enamel Paints</p>	<p>The primer and paint shall be of approved quality and of approved manufacture like Asian Paints, Nerolac, Jenson, Berger British Paints India Ltd., Johnson and Nicholson, India or equivalent brand approved by the Engineer. These materials shall be ready mixed and in sealed tins with manufacturer's name, colour and instruction clearly painted in the container.</p> <p>Preparation of Surface All surfaces to be painted shall be planed and thoroughly sand papered, first by using No. 120 sandpaper. Ordinary putting shall fill up nail holes, cracks or other in equalities. Putting shall be made up of 2 parts of best quality whiting (absolutely dead stone lime) 1 part if white lead mixed together in linseed oil and kneaded (3 oz. of linseed oil to 1 lb. of whiting).</p> <p>A primer coat shall be locally applied in holes, cracks etc. before putty is applied. The putty/paste fillers shall be of approved quality and manufacture and shall be applied to the surface with a knife or other sharp edged tools after the priming coat as well as after each undercoat. After the surface is dry, it shall be sand paper by using No. 60 sandpaper.</p> <p>Surface so prepared shall be painted with one coat of primer. The primed surface when dry shall be sand papered by using No. 100 sand paper.</p> <p>The primed surface so prepared shall be painted with one coat of</p>

	<p>selected enamel using bristle brush and not horsehair ones. The paint shall be applied in thinnest possible layers with parallel strokes Care shall be taken to ensure the surface being free from dust or other foreign material before priming or enamelling the surface. No paint shall splash on the floor, wall jambs, sill or other part of the building.</p> <p>Application</p> <p>On Wood work After preparing and after the priming coat has been applied a topcoat shall be applied. The primed surface so prepared shall be painted with one coat of selected enamel using bristle brush and not horsehair ones. The paint shall be applied in thinnest possible layers with parallel strokes. Another coat shall be applied after the previous coat is dry. Care should be taken that dust or other foreign materials do not settle or otherwise disfigure the various coats. The same brand of materials will be used for various coats. The paint shall be used and applied as per manufacture's printed instruction. The paints shall be applied with bristle brushes and not horse hair ones. The paints shall be applied in the thinnest possible layers with parallel drawings, no flowing down shall be allowed. Painting to false ceiling and acoustic materials such as thermo Cole, perforated acoustic tile, soft board etc. shall be done by spray painting only. The Engineer prior to commencement of work shall approve sample of workmanship.</p> <p>On metal surface The paint shall be continuously stirred in the container so that its consistency is kept uniform throughout. The painting shall be laid on evenly smoothly by means of crossing and laying - off. The crossing and laying off consists of covering the area with paint, brushing the surface hard for the first time and then brushing alternatively in opposite directions, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process no brush marks shall be left after the laying – off if finished. The full process of crossing and laying - off will constitute one coat. Where so stipulated, the painting shall be carried out using spray machines suited for the nature and location of the work to be carried out. Only skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding suitable thinner. Spraying shall be carried out only in dry conditions. No exterior painting shall be done in damp foggy or rainy weather. Surface to be painted shall be clean, dry, smooth, and adequately protected from dampness. Each coat shall be applied in sufficient quantity to obtain complete coverage, shall be well brushed and evenly worked out over the entire surface and into all corners, angles and crevices allowed to thoroughly dry. Second coat shall be of suitable shade to match final colour, and shall be approved by the Engineer before final coat is started. Allow at least 48 hours drying time between coats for interior and 7 days for exterior work, and if in the judgement of the Engineer more time is required it shall be allowed. Finished surfaces shall be protected from dampness and dust until</p>
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		<p>completely dry. Finished work shall be uniform, of approved colour, smooth and free for runs, sags, defective brushing and clogging. Make edges of paints adjoining other materials of colours sharp and clean, without overlapping.</p> <p>Finish: The painted surfaces shall present uniform appearance and semi – glass finish free from steaks, blisters etc.</p> <p>Measurement Measurement shall be in square meters of the actual covered area. Nothing extra shall be allowed for painting any rough surface e.g. external sand - faced plaster or work in short width or surface in any shape. The measurement shall be as follows:</p> <table border="1"> <thead> <tr> <th>Description of Work</th> <th>Measurement Method</th> <th>Overlapping Factor</th> </tr> </thead> <tbody> <tr> <td>Panelled or Framed</td> <td rowspan="8">Measured flat (not girthed) end of frame to frame.</td> <td>1.5 for each side</td> </tr> <tr> <td>Ledged & Battened</td> <td>1(1/8) for each side.</td> </tr> <tr> <td>Flush</td> <td>1 for each side.</td> </tr> <tr> <td>Fully glazed or gauged</td> <td>0.5 for each side.</td> </tr> <tr> <td>Part panelled and par</td> <td>1 for each side.</td> </tr> <tr> <td>Fully ventilated or Louvered</td> <td>1.5 for each side.</td> </tr> <tr> <td>Boarding with covered fillet and match boarding</td> <td>1.5 for each side.</td> </tr> <tr> <td>Tile & slate battening</td> <td>Measured flat (no deduction for open spaces)</td> <td>3/4 for overall</td> </tr> <tr> <td>Trellis or Jaffri</td> <td>The height shall be taken from the lower end of the palisade up to the top of the palisade but not to the standards if they are higher.</td> <td>1 for Painting all over</td> </tr> <tr> <td>Gates and open palisade fencing including standard braces, rails, stays</td> <td>Measured flat</td> <td>1 for Painting all over</td> </tr> <tr> <td>Carved or enriched work</td> <td>Measured flat</td> <td>1.5 for each face.</td> </tr> <tr> <td>Corrugated sheet.</td> <td></td> <td>114% of flat area</td> </tr> </tbody> </table> <p>The rate shall include for specified coats inclusive of materials, labour, scaffolding, all complete</p>	Description of Work	Measurement Method	Overlapping Factor	Panelled or Framed	Measured flat (not girthed) end of frame to frame.	1.5 for each side	Ledged & Battened	1(1/8) for each side.	Flush	1 for each side.	Fully glazed or gauged	0.5 for each side.	Part panelled and par	1 for each side.	Fully ventilated or Louvered	1.5 for each side.	Boarding with covered fillet and match boarding	1.5 for each side.	Tile & slate battening	Measured flat (no deduction for open spaces)	3/4 for overall	Trellis or Jaffri	The height shall be taken from the lower end of the palisade up to the top of the palisade but not to the standards if they are higher.	1 for Painting all over	Gates and open palisade fencing including standard braces, rails, stays	Measured flat	1 for Painting all over	Carved or enriched work	Measured flat	1.5 for each face.	Corrugated sheet.		114% of flat area
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H3	Chapra Paint	<p>Chapra (french Wood) polish is prepared from the chapra mixed with spirit. Two layers of resin is applied by the smooth cotton clothes and dried.</p> <p>Preparation of Surface</p>																																	

		<p>Before application of Chapra polish, the timber surfaces shall be thoroughly sand papered to obtain smooth surfaces and all the dust are removed from the surfaces. A coat of primer of chalk power mixed with resin or readymade approved putty is applied and sand papered to fill in the voids and joints.</p> <p>Preparation & Application The Chapra polish shall be made by mixing Chapra granules, thinner and spirit. The chapra must completely dissolve in the spirit. Over the primed surfaces, the Chapra polish of approved quality shall be applied with smooth cotton cloth with firm rubbing and spread evenly. The cloth shall be of good quality and perfectly cleaned. Chapra wood finish shall be reapplied at least three times, after sandpapering with finer sand paper to get the final finish & best result.</p> <p>Measurement The measurement shall be in square metres of the finished work. The rate shall include all the materials and labour, all complete.</p>
15. I Damp Proof Works		
I1	Semi flexible polymer coating system	<p>Providing and applying 2 coat waterproofing coating system for protecting concrete and masonry on RCC roof top, basements slabs, terrace and sunken slabs area over the entire surface including surface preparation, pipe lines and other joints 2 coat shall be applied by brush at the ratio of 1:2 (Perma Bond AR /Shield liquid/ tapecrete P 151 and fresh grey cement powder) or as approved by site engineer according to respective manufacturers specification</p> <p>Materials: Approved polymer materials from manufacturer (Tapecret P 151, Perma Bond AR/ Perma Shield or equivalent) as approved by site engineer shall be applied. Technical specification from manufacturer and the warranty provision / document shall be submitted to the site engineer by the contractor.</p> <p>Mixing: - The polymer shall be mixed with neat cement in the ratio of 2 part cement: 1-part polymer by weight. The mixture has to be stirred thoroughly until no air bubbles remain in the mix. Any lump found in the mix should be removed.</p> <p>Surface preparation: The surface shall be cleaned to remove all dust, foreign matters, loose materials and any deposits of contamination which could affect the bond between the surface and the waterproofing coating. By scarifying, grinding, water blasting, sand blasting, acid washing or other approved method. New flat surface like sub base concrete shall be made reasonably smooth so as not to impede the application of the waterproofing coating and to avoid sharp projection. All concrete shall be thoroughly pre-wetted for at least prior to th application of the coating by pouring water on flat surface or by vigorously spraying water on vertical/ inclined surfaces. Depressions shall be filled and levelled after engineer approval</p> <p>Application: -</p>

		<p>The mix shall be applied in 2 coats by brush on rendered and / or prepared surface. First coat should be allowed to stir dry for 5-6 hours. The coatings shall be applied in uniform thickness to horizontal and vertical surfaces. The surface should be made wet before application in case of porous structure.</p> <p>Curing and Protection</p> <p>The surface after application shall be kept moist for a period of 2-3 days. Curing shall be started as soon as the chemical has hardened sufficiently so as not to be damaged by a fine water spray. After application of final coat, initial air drying shall be done for 2-6 hours. During this period no water is to be used for curing. In case of high temperature and low humidity combined with high wind condition, the coating shall be covered with polythene sheet to avoid rapid drying of the coating.</p> <p>After maximum period of 6 hours of the final application, moist curing shall be done for next 24 hours by way of spraying water on the coating. During the period at no point of time should the coating be left completely dry or submerged in water.</p> <p>During the first 12 hours of curing, the work shall be protected from abrasion, rain, and other adverse conditions. After moist curing, the coating shall be allowed to air dry for 3 days before submersion in water if required for use.</p> <p>The finished coat shall be tough, hard-wearing surface with waterproofing and shall allow trapped vapour to escape preventing peeling and blister formation.</p> <p>Measurement / Payment</p> <p>Measurement shall be in square meter of exact length and breadth. Rate shall include materials, mixing, laying, curing, finishing and labour etc., all complete.</p>
15.J Dismantling Works		
J1	Dismantling Concrete Works	<p>The Contractor shall dismantle any plain or reinforced concrete works as indicated in the Drawings or as ordered by the Engineer. The resulting material shall remain the property of the Employer and all suitable materials shall be stockpiled for reuse purposes within a lead of 30 meter. Unsuitable material shall be disposed off as directed by the Engineer.</p> <p>Concrete/reinforced concrete dismantling shall include use of labour and proper equipment, transporting, stockpiling and all incidental and provisions necessary to complete the work.</p>
J2	Wood works	<p>The Contractor shall dismantle any wood works as indicated in the drawings or as instructed by the Engineer. The resulting material shall remain the property of the Employer and all suitable material shall be stockpiled for reuse purposes within a lead of 30 m as directed by the Engineer.</p>
15. K Metal Works		
K 1	Fabrication of MS Members	<p>The Mild steel (MS) products including collapsible gates are fabricated from the Mild Steel flat, angle and channels conforming to the BS 15 or equivalent. The welding shall be butt-welding. The grips are of plastic or metal. The screws shall be steel screws.</p> <p>The product is primed with two coats of red lead primer.</p>

		<p>Measurement The work shall be measured in m² of opening in vertical plan or in unit weight as specified in the Bill of Quantity.</p> <p>Payment Payment for the work will be made on the basis of contract unit price indicated in the BOQ. The payment will be full and final compensation for all material, labour, and equipment to complete the works as specified.</p>
K 2	MS Gate	<p>The Mild steel gates are fabricated from the Mild Steel flat, angle and channels conforming to the BS 15 or equivalent. The welding shall be butt-welding conforming relevant clause of this specification The grips are of plastic or metal. The screws shall be steel screws. The gate shall of steel sheet conforming to BS 15 or equivalent of 20G. The gate is primed with two coats of red lead primer. The gate is painted with two coat of enamel of bituminous aluminium paint to get uniform painted surfaces.</p> <p>Measurement The above work shall be measured in m² of opening in vertical plan completed as specified.</p> <p>Payment Payment for the work will be made on the basis of contract unit price indicated in the BOQ. The payment will be full and final compensation for all material, labour, and equipment to complete the works as specified.</p>