

3.01.a Providing form work of ordinary timber planking and/or shuttering plywood and /or steel plates with supporting system of steel props so as to give smooth/ fair finish, including centering, shuttering, strutting and propping, etc. complete, height of propping and centering below supporting floor to ceiling not exceeding 4.5 m., and removal of the same for in-situ reinforced concrete and plain concrete work, in foundations, footings, bases of columns, retaining walls etc. and mass concrete.

1.0 Materials :

1.1 The shuttering to be provided shall be of ordinary timber planks/shuttering ply /steel sheets shall conform to M-26A. M-26B & M26C respectively.

1.2 The dimensions of scantling and battens shall conform to the design. The strength of the form work shall not be less than that assumed in the design.

2.0 Workmanship :

2.1 The form work shall conform to the shape, lines and dimensions as shown on the drawings and shall be so constructed so as to remain sufficiently rigid and water-tight, during the placement and compaction of the concrete. Adequate arrangement shall be made by the Contractor to safe guard against any settlement of the form work during the course of concreting and after concreting. The formwork of shuttering, centering, scaffolding, bracing, etc. shall be as per the design. False staging should be erected with MS –adjustable props or H frames or equivalent system

2.2 **Cleaning & Treatment of Forms :** All rubbish, particularly chipping, shaving and saw dust shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetted or treated. The surface shall be coated with mould releasing agent, applied before concreting is done. Shuttering releasing agent of approved manufacture may be applied. Care shall be taken that the coating is not applied on the construction joints surface and steel reinforcement bars.

2.3 **Stripping Time :** In normal circumstances and where ordinary portland cement is used, form work may be struck after expiry of the following periods subject to approval/confirmation from Engineer in charge:

(a) Sides of walls columns and vertical faces of beams				24 to 48 hours.
(b) Beam soffits (Props left under)				7 days.
(c) Removal of props for slabs -		(i) Slabs spanning upto	4.5 m.	7 days.
(ii) Slabs spanning over 4.5 m.				14 days.
(d) Removal of props to beams and Arches -(i) Spanning upto		6 m.		14 days.
(ii) Spanning over 6 m.				21 Days.

2.4 **Procedure while removing the form work :** All form work shall be removed without such shocks or vibrations as would damage the reinforced concrete surface. Before the soffit form work and struts are removed, the soffits and the concrete surface shall be exposed where necessary, in order to ascertain that the concrete has sufficiently hardened.

2.5 Centering :

2.5.1 The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the form work and concrete work before, during and after pouring concrete till it achieved full strength. Watch should be kept to see that behavior of centering and form work is

satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

2.5.2 The props of centering shall be provided on firm foundation or base of sufficient strength to carry the loads, without any settlement.

2.5.3 The centering and form work shall be inspected and approved by the Engineer-in-charge, before concreting. But this will not relieve the Contractor of his responsibility for strength, adequacy and safety of form work and centering. If there is a failure of form work or centering, the Contractor shall be responsible for the damages to the work, injury to life and damage to property.

2.6 **Scaffolding :**

2.6.1 All scaffolding, hoisting arrangements and ladders, etc. required for facilitating of concreting shall be provided and removed on completion work by Contractor, at his own expense. The scaffolding, hoisting arrangement, ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, Contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangement, ladders, work and workmen, etc.

2.6.2 The scaffolding, hoisting arrangements and ladders shall allow easy approach to the work spot and afford easy inspection.

2.7 **Reuse :** Before re-use, all forms shall be inspected by the Engineer-in-charge and their suitability shall be ascertained. If, any of the forms are found to be unsuitable, they shall be immediately removed from the site. The forms ascertained for re-use, shall be scarred, cleaned, and joints gone over and repaired, wherever required. The inside surface shall be retreated to prevent adhesion to concrete.

3.0 **Mode of Measurements and Payment :**

3.1 Form work shall be measured as an area in m^2 of shuttering in contact with concrete except in the case of inclined members and portion of curved pro-files, in which case, only area of underside shall be measured for payment.

3.2 Form work to secondary beams shall be measured upto the sides of main beams but no deduction shall be made from the form work of the main beam at the inner section point. No deduction shall be made from the form work of a column at inner section of beams.

3.3 The rate is applicable to all conditions of working and height upto 4.5 m. The rate shall include the cost of materials, its transportation at site and labour for various operations involved such as:

- (a) Splayed edges, notching, allowance for overlaps and passing at angles, battens centering, shuttering, strutting, propping, bolting, nailing, wedging, easing, striking and removal.
- (b) Filleting to form stop chamfered edges or splayed external angles not exceeding 20 mm. width to beams, columns and the like.
- (c) Temporary opening in the forms for pouring concrete.
- (d) Scarring, removal of rubbish, dressing with approved shuttering releasing agent to prevent adhesion of concrete with shuttering,
- (e) Raking or circular cutting.
- (f) Making necessary grooves , gissis using 10 mmX10 mm PVC battens of accucell or equivalent, cut-outs, pockets and drip moulds (grooves) .if the grooves, gissis , drip mould (grove) are not provided during execution the same shall be carried out by cutting with concrete cutter & finishing smooth /rendering at no extra cost.

The rate is for the completed item.

3.4 The rate shall be for a unit of one m².

D01 Providing rigid and water tight centering and shuttering using best quality wood / plywood / steel forms and centering with steel props, acrotubes, acrospans, etc. including strutting, propping, bracing, staging etc. complete for all RCC items fixed in position as required including labour for careful removal of form work etc. complete all as per specifications at all heights/all levels /all floors (for foundation and up to plinth and superstructure works) for Horizontal / Vertical / Circular / slanting surfaces all as per specifications.

Note: The quoted rate should be inclusive of providing & applying mould release agent ("Reebol" of Fosroc make), binding wire, spacers, cover blocks, sleeves, cut out of required size & shape etc.

The relevant specifications of item no. 3.01.a shall be followed except that, shuttering ply wood, steel sheathing and/or steel plates shall be used instead of ordinary timber planking with supporting system as specified in SOQ.

D02 Extra over specification item no. D01 for providing everything necessary for special formwork and supports for casting 1.8m thick RCC Wall for all heights upto 9.0m height from floor level.

Note: floor level means the floor from which supports has been provided.

Case 1 - Contractor if willing to use customized designed formwork then the formwork design should be got prepared and certified by the structural consultants and in

Case 2 - If contractor is willing to procure and use readymade formwork manufactured by agency then even in that case the information or details should be got certified by the structural consultants.

In either of the case nothing shall be paid extra to the contractor. Item rate quoted should all be inclusive of all. Contractor will have to submit all relevant information and details to the Institute well before execution. The responsibility for executing the work in safe and sound manner with appropriate use of tools, machinery, methodology and delivering work in best workmanship like manner, in line and level will be sole responsibility of the contractor.

The relevant specifications of item no. 3.01.a and D01 shall be followed except that everything necessary for formwork should be provided for casting of 1.8m thick RCC Wall.

D03 Extra over specification item no D01 but for providing everything necessary for special formwork and supports for casting 0.5m thick. RCC Slab for all heights upto 9.0m height from floor level.

Note: floor level means the floor from which supports has been provided.

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Case 2 - If contractor is willing to procure and use readymade formwork manufactured by agency then even in that case the information or details should be got certified by the structural consultants.

In either of the case nothing shall be paid extra to the contractor. Item rate quoted should

all be inclusive of all. Contractor will have to submit all relevant information and details to the Institute well before execution. The responsibility for executing the work in safe and sound manner with appropriate use of tools, machinery, methodology and delivering work in best workmanship like manner, in line and level will be sole responsibility of the contractor.

The relevant specifications of item no. 3.01.a and D02 shall be followed except that everything necessary for formwork should be provided for casting of 0.5m thick RCC Slab.

3.02.a Extra for providing and erecting false staging with MS props or MS H frames for each additional height of propping and centering where the height of propping and centering exceeds 4.5 m. between supporting floor to ceiling, including temporary masonry work or stone pillars for supporting as required with adequate bracing / propping with steel props / H Frames etc. including cost of dethuttering and centering at all levels (height more than 4.5 m. and upto 9.0 m.) **Note: Plan area to be measured for payment.**

1.0 **Material and Workmanship :** The relevant specification of item no. 3.01.a shall be followed except that the height of propping and centering between supporting floor to ceiling exceeds 4.5 m. upto 9.0 m **with supporting system as specified in SOQ.**

2.0 **Mode of Measurements and Payment :**

2.1 The payment shall be made for the false staging work. This will be paid only if there is no slab/platform in between and extra staging is necessary. Extra over and above the payment made for form work of slab in relevant items. The work of false staging shall be measured in m^2 . The relevant specification of item no. 3.01.a shall be followed. The rate includes the cost of providing stone or masonry temporary pillars for supporting, as required without any extra cost.

2.2 The rate shall be for an unit of one m^2 .

2.3 False staging for vertical RCC elements like column, beam & wall etc .shall not be measured & paid

3.02.b Extra for further additional height of propping and centering where the height of propping and centering exceeds 9.0 m. between supporting floor to ceiling including temporary brick or stone pillars for supporting as required (height more than 9.0 m. and upto 18 m.)

The relevant specification of item no. 3.02.a shall be followed except that the height of propping and centering exceeds from 9.0 m. upto 18 m. between supporting floor to ceiling.

D04 Extra for additional height above 4.5m from floor level upto 9.0m height of centering, shuttering wherever required with adequate bracing, propping with steel props, acrotubes, H-Frames, etc., including cost of de-shuttering and decentering at all levels, for suspended floors, roofs, landing, beams and balconies and Slabs ; for;

NOTE:

1) Plan area to be measured

2) Floor height to be taken from finished floor level.

3) The quoted rate is for additional height Upto 9.0 mtrs from floor level from where the centering and shuttering has been erected..

Relevant specification of item no. 3.02a to be followed except providing everything necessary for casting of 0.5m thick RCC Slab with clear height of 9.0mtr.

- 3.03.a** Extra for providing formwork for exposed concrete surface in desired pattern and size, using laminated shuttering plywood, including neat cleaning & rendering the exposed concrete surface as per the sample approved & as directed by the Engineer-in-charge. (Same kind of shuttering material should be only used for standard and residual sizes.)
- (A) Foundation, footing, bases of columns, retaining walls etc. and mass concrete.
 - (B) Flat surfaces (any thickness) such as soffits of slab, sill slabs, lofts, balconies, sloping slabs, landing and the like.
 - (C) Vertical surface such as walls (any thickness), partitions .
 - (D) Columns, pillars, posts and struts, (any cross-sectional area), Square, rectangular, circular and multi-faced.
 - (E) Beams, lintels, cantilevers, beam hunching, girders, Arches, (any cross-sectional area), Sides and soffits of the above.
 - (F) Edges of slabs, and breaks/cut-outs in floors and walls.
 - (G) Small surfaces such as cantilever ends, brackets, ends of steps, caps, copings and bases to pillars and columns including edges.
 - (H) Collar woods, weather sheds, chhajjas, cornice, corbellings, domes, vaults, etc. and the like.
 - (I) Stair cases with sloping or steeped soffits, including risers, skingers, excluding landing.
 - (J) Vertical fins and vertical sun breakers.
- 1.0** **Materials and Workmanship :** The relevant specification of item No.3.01.a shall be followed except that the extra rate shall be paid for using laminated shuttering plywood instead of ordinary timber planks, to obtain a desired smooth exposed finish of surface. Only similar type of material shall be used for the entire work. The surface shall be presentable without further treatment.
- 2.0** **Mode of Measurements and Payment :**
- 2.1** The measurement of form work shall be taken for the form work done with laminated shuttering plywood, extra over the rate of form work of the respective item of form work done. The relevant specification of respective item No. 3.01.a shall be followed.
- 2.2** The rate shall be for an unit of one m².
- 3.03.b** Extra for providing formwork for exposed concrete surface in desired pattern and size, using welded steel shuttering plates , including neat cleaning & rendering the exposed concrete surface as per the sample approved & as directed by the Engineer-in-charge. (Same kind of shuttering material should be only used for standard and residual sizes.)
- (A) Foundation, footing, bases of columns, retaining walls etc. and mass concrete.
 - (B) Flat surfaces (any thickness) such as soffits of slab, sill slabs, lofts, sloping slabs, landing and the like.
 - (C) Vertical surface such as walls (any thickness), partitions.
 - (D) Columns, pillars, posts and struts, (any cross-sectional area), Square, rectangular, circular and multi-faced.
 - (E) Beams, lintels, girders, Arches, (any cross-sectional area), Sides and soffits of beams, beam hunching, cantilevers, girders and lintels.
 - (F) Edges of slabs, and breaks in floors and walls.
 - (G) Small surfaces such as cantilever ends, brackets, ends of steps, caps, copings and bases to pillars and columns including edges.
 - (H) Collar woods, weather sheds, chhajjas, cornice, corbellings, domes, vaults, etc. and the like.
 - (I) Stair cases with sloping or steeped soffits, including risers, skingers, excluding landing.

(J) Vertical fins and vertical sun breakers.

- 1.0. Materials and Workmanship :** The relevant specification of item No.3.01.a shall be followed except that the extra rate shall be paid for using sheathing of steels and/or plates of steel instead of ordinary timber planks, to obtain a desired smooth exposed finish of surface. Only similar type of material shall be used for the entire work. The surface shall be presentable without further treatment.
- 2.0 Mode of Measurements and Payment :**
- 2.1** The measurement of form work shall be taken for the form work done with steel sheathing, extra over the rate of form work of the respective item of form work done. The relevant specification of respective item No. 3.01.a shall be followed.
- 2.2** The rate shall be for an unit of one m².