STANDARD SPECIFICATION

FOR

RANDOM RUBBLE

MASONRY WORKS
SPECIFICATION : RANDOM RUBBLE MASONRY WORKS

1.0 SCOPE

This specification establishes the materials, dressing, lying, jointing, workmanship, curing etc. for stone masonry works and shall comply with all the requirements of IS: 1597.

2.0 GENERAL REQUIREMENTS

2.1 Materials

Stones used in masonry shall be of approved quality locally available black trap. They shall be hard, sound and free from decay, weathering and fissures. Stones with round surface shall not be used.

2.2 Cement Mortar

Cement mortar shall meet the requirements of IS: 2250 and shall be prepared by mixing cement and sand by volume. Proportion of cement and sand shall be 1:6 (one part of cement and six part of sand) or as specified. The
sand being used shall be sieved before use. The mortar shall be used as soon as possible after mixing and before it has begun to set and in any case within initial setting time of cement, after the water is added to the dry mixture. Mortar unused for more than initial setting time or cement shall be rejected and removed from the site of work.

2.2.1 Proportioning

The unit of measurement for cement shall be bag of cement weighing 50 KGs and this shall be taken as 0.035 cubic meter. Sand shall be measured in boxes of suitable size on the basis of its dry volume. In case of damp sand, its quantity shall be increased suitably to allow for bulkage.

2.2.2 The mixing of mortar shall be done in a mechanical mixer operated manually or by power. The Engineer-In-Charge may however, permit hand mixing, as a special case, taking in to account the magnitude nature and location of work. The Contractor shall take the prior permission of the Engineer-In-Charge in writing, for using hand-mix, before the commencement of work.

2.2.2.1 Mixing in Mechanical Mixer
Cement and sand in specified proportions, by volume shall be thoroughly mixed dry in a mixer. Water shall then be added gradually and wet mixing continued for at least one minute. Care shall be taken not to add more water than that which shall bring the mortar to the consistency of a stiff paste. Wet mix from the mixer shall be unloaded on water-tight masonry platform, made adjacent to the mixer. Platform shall be at least 150mm above the leveled ground, to avoid contact of surrounding earth with the mix. Size of the platform shall be such that it shall extended at least 300mm around the loaded wet mix area. Wet mix, so, prepared shall be utilized within initial setting time of cement (thirty [30] minutes foe ordinary Portland cement conforming to IS: 269) after addition of water. Mixer shall be cleaned with water each time before suspending the work.

2.2.2.2 Hand Mixing

The measured quantity of sand shall be leveled on a clean masonry platform and cement bags emptied on top. The cement and sand shall be thoroughly mixed dry by being turn over and over, backward and forward, several times till the mixture is of uniform color. The quantity of dry mix which can be consumed within initial setting time of
cement shall then be mixed with just sufficient quantity of water to bring the mortar to the consistency of stiff paste.

2.3 Curing

Green work shall be protected from rain, running water of accumulated water from any source, by suitable means. Masonry work, as it progresses shall be kept thoroughly wet by sprinkling water at regular intervals, on all faces. Curing shall be done after 24 hours of completion of day’s work and shall be done for at least 10 days after completion. Proper watering cans with spray nozzles, rubber or PVC pipes shall be used for this purpose.

2.4 Staging/Scaffolding

2.4.1 Staging/Scaffolding shall be properly planed and designed by the Contractor. Use of only steel tubes is permitted for Staging/scaffolding. Design of staging/scaffolding shall be submitted for approval of the Engineer-In-Charge, before commencement of work.

Single scaffolding having one set of vertical support, shall be used and other end of the horizontal scaffolding member shall rest in a hole provided in header course. The
support shall be sound and strongly clamped with the horizontal pieces over which the scaffolding planks shall be fixed. The holes left in the masonry works for supporting the scaffolding shall be filled and made good with plain cement concrete of grade 1:3:6 during plastering. Suitable access shall be provided to the working platform area. The scaffolding shall be strong enough to withstand all loads likely to come upon it and shall also meet all the requirements specified in IS: 2750.

The following measure shall also be considered during erection of the scaffolding/staging.

a. Sufficient sills or underpinning, in addition to base plates shall be provided, particularly, where scaffolding are erected on soft grounds.

b. Adjustable bases to compensate foe uneven ground shall be used.

c. Proper anchoring of the scaffolding/staging at reasonable intervals shall be provided in each direction with the main structure wherever available.
d. Horizontal braces shall be provided to prevent the scaffolding from rocking.

e. Diagonal braces shall be provided continuously from bottom to top between two adjacent rows of vertical supports.

f. The scaffolding/staging shall be cracked at every stage for plumb line.

g. Wherever the scaffolding/staging is found to be out of plumb, it shall be dismantled and re-erected afresh. Effort shall not be made to bring it in line with a physical force.

h. All clamps and couplings shall be properly tightened with nuts and bolts to avoid slippage.

i. Erection work of a scaffolding/staging under no circumstances shall be left totally to semiskilled or skilled workmen and shall be carried out under the supervision of contractor’s technically qualified civil engineer.
2.4.2 For smaller works or works in remote areas, wooden ballies may be permitted for scaffolding/staging by the Engineer-In-Charge at his sole discretion. The contractor must ensure the safety and suitability of such works as described under clauses 2.4.1 above.

2.5 Embedment of Fixtures

All fixtures, pipes, conduits, holdfasts of doors and windows etc. required to be built in walls, shall be embedded in plain cement concrete of grade 1.3.6 at the required position as the work proceeds.

3.0 SPECIFIC REQUIREMENTS

3.1 Random Rubble Masonry

3.1.1 Dressing

Stone shall be hammer dressed on the face, the sides and the beds to enable it to come in proximity with the neighboring stone. The “bushing” (projection) on the face shall not be more than 40mm on an exposed face and 19mm on the face to be plastered. It shall not have
depression more than 10mm from the average wall surface. It shall also conform to the general requirements for dressing of stones covered in IS: 1129.

3.1.2 Laying

All stones shall be wetted before laying to prevent absorption of water from mortar. The stones shall be laid so that the pressure is always perpendicular to the natural bed. The courses (if any) shall be built perpendicular to the pressure which the masonry will bear. In case of battered walls, the base of stone and plan of courses (if any) shall be at right angles to the batter.

The walls shall be carried up truly plumbed or to the specified batter. Every stone shall be carefully fitted to the adjacent stones, so as to form neat and close joints. Vertical joints shall be staggered as far as possible.

Stone may be brought to level course at plinth, Window sills and roof level. Leveling up at plinth level, window sills and roof level shall be done with concrete comprising of one part of the mortar as used for the masonry and two parts of graded stone aggregate of 20mm nominal size.
The bond shall be obtained by fitting in closely the adjacent stones. Transverse bonds shall be provided by the use of bond stones extended from the front to the back of the wall. At angular junctions the stones at each alternate course shall be well bonded into the respective courses of the adjacent wall.

Face stones shall extend and bond well in the back. These shall be arranged to breaked joints as much as possible, and to avoid long vertical lines of joints. The depth of stone from the face of the wall inwards shall not be less than the height or breadth at the face.

Where there is a break in the masonry work, the masonry shall be raked in sufficiently long steps for facilitating joining of old and new work. The stepping of the raking shall not be more than 45 degrees with the horizontal. The masonry work shall not be raised more than 1.2 meter per day. Toothed joints in masonry shall not be permitted.

3.1.3 Hearing of Chips

The hearting or interior filling of the wall shall consist of rubber stones which may be of any shape but shall not be less than 150mm on any face. These shall be carefully
laid, hammered down with a wooden mallet into position and solidly bedded in mortar. The hearting should be laid nearly level with facing and backing, except that at about one meter intervals, vertical bonds stones shall be firmly embedded to form a bond between successive courses.

3.1.4 Insertion of Chips

The chips and spalls of stones shall be used wherever necessary to avoid thick mortar beds or joints and it shall also be ensured that no hollow spaces are lefty any where in the masonry. The chips shall not be used below there hearting stone to bring these up to the level of face stones. The use of chips shall be restricted to the filling of interstices between the adjacent stones in hearting and this shall in no case exceed 20% of the quantity of stone masonry.

3.1.5 Bond Stone

Bond or through stone running across the thickness of wall shall be provided in the walls having thickness up to 600mm, two or more bonds stones overlapping each other by at least 150mm shall be provided in a line from face to back. At least one bond stone or a set of bond stones shall
be provided for every 0.5 sq.m courses and shall be staggered in subsequent course. An identification mark for the bond stones shall be given on both faces.

3.1.6 Quoins

The quoins shall be of selected stones neatly dressed to the required angle and shall be of the same height as the course in which they occur and laid header and stretcher alternately. The quoin shall not be less than 0.03 cubic meters in volume.

3.1.7 Jointing

Stones shall be so laid that all joints are fully packed with mortar. Face joint shall be minimum 20mm thick. The joints shall be struck flush and finished at the time of laying; when plastering and pointing is not required. If walls are to be plastered or pointed, joint shall be raked to a minimum depth of 20mm during the progress of work when the mortar is still green. For the faces of the wall which are not to be plastered, stone surface shall be cleared of mortar splashing to give uniform stone appearance.
4.0 PAYMENT

4.1 General

The payment for stone masonry works shall be inclusive of all labour, material, sampling and testing, scaffolding/staging dressing, wetting, out of stones laying etc., raking of joints, curing, pointing, providing recesses and making circular or rectangular opening, sealing the gap between the masonry and soffit or beam/slab with and including cement mortar, making of masonry platform for unloading the wet mix, embedding fixtures/fittings including providing PCC(1:3:6) etc., for all heights and depths. Deduction for circular or rectangular openings or for making pockets shall be as per relevant IS Codes.

4.1.1 Payment for random rubble stone work shall be made on cubic meter basis on the volume of work done, to be measured as per relevant IS Codes.