TABLE OF CONTENTS

4. DISMANTLING (Demolition)

4.0 GENERAL

The term “Dismantling” means to carefully take apart one or more parts of a building or structure without damaging the other parts. The term ‘Demolition’ on the other hand implies breaking up. The work may comprise dismantling/demolishing whole or part of work including all relevant items consisting of but not limited to stone work, brick work, concrete, floorings, roofing and iron work as specified and or shown on the drawings.

4.1 PRECAUTIONS

a) All materials retrieved from dismantling or demolition shall be properly stored/ stacked and shall be the property of the Client/Owner unless otherwise specified and shall be kept in safe custody until they are handed over to the Engineer-in-Charge/ Authorized Representative.

b) Before commencement of dismantling/demolition, the Contractor shall prepare and submit his proposals and program for proceeding with the work for approval of the Engineer-in-Charge. Generally, the Contractor will be permitted to demolish the structures only through approved means, Blasting can be permitted provided the necessary precautions are taken to protect the Works, public and private property and all persons in the vicinity of the Works, except if there be pumps, motors, hand rails, structural steel, bricks and other usable materials, the Contractor shall salvage and immediately handover to the Employer at the site of salvaging all such equipment and materials prior to demolishing or removing the structure.

c) The work should generally be performed in reverse order of the one in which the structure was constructed. Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property., Temporary enclosures or partitions and necessary scaffolding wherever specified shall also be provided, as directed by the Engineer-in-Charge.

d) Necessary steps/ precautions should be taken to keep noise and dust nuisance to a minimum. If specified or directed by the Engineer-in-Charge, the Contractor shall provide, erect and remove screens of canvas or other suitable material to minimize the nuisance from dust and shall provide for watering as the work of demolition proceeds. Helmets, goggle, safety belts etc. should be used whenever required and as directed by the Engineer-in-Charge. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first. Chisels and cutters may be used carefully as directed. The dismantled articles should be removed manually or lowered to the ground and then properly stacked as directed by the Engineer-in-Charge.

e) Dismantling shall be done by taking out the fixtures with proper tools and not by tearing or ripping off. Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-Charge. All unserviceable materials, rubbish etc. shall be disposed off as directed by the Engineer-in-Charge.

f) The contractor shall maintain/ disconnect existing services, whether temporary or permanent. No demolition work should be carried out at night especially when the building or structure to be demolished is in an inhabited area. Screens shall be placed where necessary to prevent injuries due to falling pieces. Water may be used to reduce dust while tearing down plaster from brick work. Safety belts shall be used by labourers while working at higher level to prevent falling from the structure. First-aid equipment shall be got available at all demolition works of any magnitude.

4.2 MEASURES TO BE ADOPTED FOR DEMOLITION OF CERTAIN ELEMENT OF STRUCTURES

4.2.1 ROOF TRUSSES

In case of a pitched roof, the roof structure should be removed to wall plate level manually. Sufficient purloins and bracing should be retained to ensure stability of the remaining roof trusses while each individual truss is removed progressively. Temporary bracing should be introduced,

where necessary, to maintain stability. The end frame opposite to the end where dismantling is commenced, should be independently and securely guyed in both directions before commencement of work.The bottom tie of roof trusses should not be cut until the principal rafters are prevented from making outward movement.

4.2.2 HEAVY FLOOR BEAMS

Heavy bulks of timber and steel beams should be supported before cutting at the farthest point and should then be lowered to a safe working place.

4.2.3 JACK ARCHES

Where tie rods are present between main supporting beams, these should not be cut until the arch or series of arches in the floor have been removed. Due care should be exercised and full examination of this type of structure undertaken before demolition is commenced. The floor should be demolished in strips parallel to the span of the arch. rings (at right angles to the main floor beams).

4.2.4 BRICK ARCHES

Full time supervision should be given by experienced persons fully conversant in the type of work to ensure that the structure is stable at all times. Dead loads as much as possible may be removed provided it does not interfere with the stability of the main arch rings but it should be noted that the load-carrying capacity of many old arches relies on the filling between the spandrels. The restraining influence of the abutments should not be removed before the dead load of the sprandrel fill and the arch rings are removed.

Special temporary support shall be provided in the case of skew bridges. A single span arch.can be demolished by hand by cutting narrow segments progressively from each springing parallel to the span of the arch until the width of the arch has been reduced to a minimum which can then be collapsed. Where it is impossible to allow debris to fall to the ground below, centering designed to carry the load should be erected and the arch demolished progressively. The design of the centering should make appropriate allowance for impact.

Where deliberate collapse is feasible the crown may be broken by the demolition ball method working progressively from edges to the centre. Collapse of the structure can be effected in one action by the use of explosives. Charges should be inserted into boreholes drilled in both arch and abutments. This method is the most effective for demolition of tall viaducts.

In multi-span arches before individual spans are removed, lateral restraint should be provided at the springing level. Demolition may then proceed as for a single span, care being taken to demolish the spandrels down to the springing line as the work proceeds. Where explosives are used it is preferable to ensure the collapse of the whole structure in one operation to prevent the chance of leaving unstable portions standing.

4.2.5 CANTILEVERS (NOT PART OF A FRAMED STRUCTURE)

A cantilever type of construction depends on the super imposed structure for its stability. Canopies, cornices, staircases and balconies should be demolished or supported before the tailing down load is removed.

4.2.6 IN-SITU REINFORCED CONCRETE

Before commencing demolition, the nature and condition of the concrete, the condition and position of reinforcement, and the possibility of lack of continuity of reinforcement should be ascertained. Attention should be paid to the principles of the structural design to determine which parts of the structure depend on each other to maintain overall stability.Demolition should be commenced by removing partitions and external non-load bearing cladding. It should be noted that in some buildings the frame may rely on the panel walls for stability. Where hard demolition methods are to be used, the following procedures should be used.

a) Reinforced Concrete Beams

For beams, a supporting rope should be attached to the beam. The concrete should than be removed from both ends by pneumatic drill and the reinforcement exposed. The reinforcement should then be cut in such a manner so as to allow the beam to be lowered under control to the floor.

b) Reinforced Concrete Columns

In case of columns, the reinforcement should be exposed at the base after restraining wire guy ropes have been placed round the member at the top. The reinforcement should then be cut in such a manner so as to allow the column to be pulled down to the floor under control.

c) Reinforced Concrete Walls

Reinforced concrete walls should be cut into strips and demolished.

4.3 MEASUREMENT AND PAYMENT

4.3.1 COMPOSITE RATE

The measurement and payment for the items of the work of Brickwork hereof shall be made corresponding to the applicable CSR items as provided in Contract Agreement and shall constitute full compensation, for procurement, transportation, performance in all respects and completion of work as specified including the site clearance as approved by the Engineer-in-Charge.

4.3.2 LABOUR RATE

The measurement and payment for the items of the work of Brickwork hereof shall be made corresponding to applicable CSR item as provided in Contract Agreement and shall constitute full compensation for procurement transportation, performance in all respects and completion of work as specified including site clearance, as approved by the Engineer-in-Charge except the cost of materials to be provided by Department at designated location as defined in the Contract Agreement.

4.3.3 QUANTIFICATION

The unit of measurement shall be measured as mentioned below in accordance with corresponding CSR items.

1. For Volumetric items, the unit of measurement shall be cubic meter or cubic foot ;
   Item No.: 4-1 to 4-20, 4-45, 4-50 and 4-51
2. For surface area items, the quantity of work shall be measured by surface area. The unit of measurement shall be Square meter or Square foot. Following items of CSR are measured according to this criteria;
   Item No.: 4-21 to 4-30,4-35(a),4-43,4-44,4-46 to 4-49 and 4-55 to 4-64
3. For linear items, the quantity of work shall be measured linearly along centre line of structure. Following items of CSR are measured according to this criteria;
   Item No.: 4-31, 4-36, 4-42 and 4-54
4. The following Items of CSR shall be measured as Each unit;
   Item No.: 4-32 to 4-34 and 4-41
5. The following Item of CSR shall be measured as Each unit for 25mm Bore;
   Item No.: 4-40
6. The following Items of CSR shall be measured per point;
   Item No.: 4-52 and 4-53
7. The following Item of CSR shall be measured as % age increase;
   Item No.: 4-65
8. The following Items of CSR shall be measured as % age Kilogram or Cwt.;
   Item No.: 4-35 (b), 4-37 and 4-38
9. The following Item of CSR shall be measured as unit of two seats;
   Item No.: 4-39