

NOTES FOR EXCAVATION & RELATED ITEMS:

No working space shall be considered beyond the width of the foundation concrete (width of PCC) shown in the drawings. The quoted rate should be inclusive of required working space, dewatering (if required), shoring & strutting (if required). The quoted rate shall include the quantity of earth work to be done for working space and also for re-filling in the foundation and plinth. For payment, the measurement shall be restricted only to the foundation width (width of PCC) shown in the drawings. No extra shall be permitted and measured for payment on account of working space / battering / benching for excavation and refilling in foundation & plinth or as directed by the EIC.

1.01a Earth work in Excavation up to 1.5 m depth from Natural Ground Level by mechanical means (Hydraulic Excavator) or manual means for FOUNDATION TRENCHES, etc. in ALL KINDS OF SOILS including dressing of sides, ramming of bottom, disposing the surplus excavated materials within Institute campus all as per specification. Note: Disposed soil to be leveled by breaking clods (if any) and neatly dressed with compaction. The quoted rate should be inclusive of Refilling in foundation and plinth or as directed by the EIC. The quoted rate should be inclusive of shoring & strutting (if required), dewatering (if required) and compaction of refilling.

1.0 General :

1.1 Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. falls under this category. For materials and workmanship for earthwork and excavation, relevant specifications of IS 1200 (Part I) and IS: 3764 shall be followed.

2.0 Clearing the Site :

2.1 The site on which the structure is to be built shall be cleared and all obstructions, loose stones, materials and rubbish of all kind, bush shall be removed, as directed. The materials so obtained shall be the property of the Institute and shall be conveyed and stacked as directed, within 50-m. lead. The roots of the trees coming in the sides of the trenches shall be cut and coated with hot asphalt.

2.2 The rate of site clearance is deemed to be included in the rate of earthwork, for which no extra will be paid.

3.0 Setting out :

3.1 After cleaning the site, the centerlines will be given by the Engineer-in-charge. The Contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the work. Contractor shall supply labours, materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

4.0 Excavation :

4.1 The excavation in the foundation shall be carried out in true line and level and shall have the width and depth, as shown in the drawings or as directed. The Contractor shall do the necessary shoring and strutting or shall provide necessary slopes to a safe angle or steps, as required or directed, at his own cost. No extra payment shall be made for such precautionary measures, taken. The bottom of the excavated area shall be leveled both longitudinally and transversely, as directed, by removing excess soil and watering, as required. No earth filling will be allowed for bringing it to level, if by mistake or any other reason, excavation is made deeper or wider than shown on the drawings or as directed.

The extra depth or width shall be made up with concrete of the same proportion, as specified for the foundation concrete, at the cost of the Contractor. The excavation up to 1.5 m. depth shall be measured under this item.

4.2 The Contractor shall at his own expense and without extra charge make provision of supporting all utility services, lighting the trenches, separating and stacking serviceable materials neatly, shoring, timbering, strutting, bailing out water either sub-soil or rainwater, including pumping at any stage of the work. Trenches shall be kept free of water while masonry or concrete works are in progress and till the Engineer-in-charge considers it necessary, i.e. till the concrete is sufficiently set.

4.3 The rates for excavation items shall include for clearing of site, surface dressing, making layout of building, fixing permanent grid points with MS angle iron posts and embedding them in C.C. 1:2:4, placed sufficiently away from the building lines, establishing bench marks etc. complete.

5.0 Disposal of the Excavated Stuff :

5.1 The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground in layers, including ramming and watering etc. complete.

5.2 The Contractor shall remove the balance of the excavated quantity from the site of work, to a place, as directed, within a lead upto 50 m. and for all lift.

6.0 Mode of Measurement and Payment :

6.1 The measurement of excavation in trenches for foundation shall be made according to **the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge**. No payment shall be made for surplus excavation made in excess of above requirements or due to stepping and sloping back as found necessary, on account of conditions of soil and requirements of safety.

6.2 The rate shall include for clearing the site, surface dressing, making layout of the building, fixing permanent grid points with MS iron posts, embedded in C.C. 1:2:4, placed sufficiently away from the building and establishing bench marks etc.

6.3 The rates shall include for necessary shoring, timbering and strutting for protection of sides of the excavated trenches and pits, pumping out rain or surface water at any stage of construction so as to keep the trenches/pits dry, to the satisfaction of the Engineer-in-charge.

6.4 The rate shall include leveling and ramming the bottoms of excavations to receive concrete, etc. including trimming to slope wherever necessary etc. complete.

6.5 In filling and refilling, clods bigger than 50 mm. shall not be allowed. The **rate shall also include backfilling of trenches up to NGL only** consolidated measurements of filling shall be paid. Consolidation to be done by mechanical compactor as per item no. 1.07.

6.6 The rate shall be for a unit of one m³.

B03 Earth work in Excavation up to 1.5 m depth from Natural Ground Level by mechanical means (Hydraulic Excavator) or manual means for FOUNDATION TRENCHES, etc. in ALL KINDS OF SOILS for lead upto 1 km and all lifts including dressing of sides, ramming of bottom, disposing the surplus excavated materials within Institute campus all as per specification for lead up to 1 km and all lifts, etc..

Note : Disposed soil to be levelled by breaking clods (if any) and neatly dressed and compacted. The quoted rate should be inclusive of Refilling in foundation and plinth in layers not exceeding 15cm depth consolidating each deposited layer by ramming, watering and dressing, etc. as directed by the EIC. The quoted rate should be inclusive of shoring & strutting (if required), dewatering (if required) and compaction of refilling.

The relevant specifications of item no. 1.01.a shall be followed.

B04 Earth work in Excavation from 1.5 m to 3.00 m depth from Natural Ground Level by mechanical means (Hydraulic Excavator) or manual means for FOUNDATION TRENCHES, etc. in ALL KINDS OF SOILS for lead upto 1 km and all lifts including dressing of sides, ramming of bottom, disposing the surplus excavated materials within Institute campus all as per specification for lead up to 1 km and all lifts, etc..

Note : Disposed soil to be levelled by breaking clods (if any) and neatly dressed and compacted. The quoted rate should be inclusive of Refilling in foundation and plinth in layers not exceeding 15cm depth consolidating each deposited layer by ramming, watering and dressing, etc. as directed by the EIC. The quoted rate should be inclusive of shoring & strutting (if required), dewatering (if required) and compaction of refilling.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 1.5 to 3.0 m. The excavation work from 1.5 m. to 3.0 m. shall be measured and paid under this item.

B05 Earth work in Excavation from 3.0 m to 5.00 m depth from Natural Ground Level by mechanical means (Hydraulic Excavator) or manual means for FOUNDATION TRENCHES, etc. in ALL KINDS OF SOILS for lead upto 1 km and all lifts including dressing of sides, ramming of bottom, disposing the surplus excavated materials within Institute campus all as per specification for lead up to 1 km and all lifts, etc..

Note : Disposed soil to be levelled by breaking clods (if any) and neatly dressed and compacted. The quoted rate should be inclusive of Refilling in foundation and plinth in layers not exceeding 15cm depth consolidating each deposited layer by ramming, watering and dressing, etc. as directed by the EIC. The quoted rate should be inclusive of shoring & strutting (if required), dewatering (if required) and compaction of refilling.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 3.0 to 5.0 m. The excavation work from 3.0 m. to 5.0 m. shall be measured and paid under this item.

1.01.b Excavation for foundation for a depth of 3.0 to 5.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in all kind of soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 3.0 to 5.0 m. The excavation work from 3.0 m. to 5.0 m. shall be measured and paid under this item.

1.01.c Excavation for foundation for a depth of 5.0 to 7.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in all kind of soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 5.0 to 7.0 m. The excavation work from 5.0 m. to 7.0 m. shall be measured and paid

under this item.

- 1.01.d Excavation for foundation for a depth of 7.0 to 9.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in all kind of soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.**

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 7.0 to 9.0 m. The excavation work from 7.0 m. to 9.0 m. shall be measured and paid under this item.

- 1.01.e Excavation for foundation for a depth of 9.0 to 11.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, , in all kind of soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.**

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 9.0 to 11.0 m. The excavation work from 9.0 m. to 11.0 m. shall be measured and paid under this item.

- 1.02.a Excavation for foundation upto 1.5 m. depth, including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in Black cotton soil excluding refilling the trenches as per item no. 1.07, including dressing the base of trench etc. complete, as directed.**

1.0 General :

- 1.1 Soil which generally possess typical characteristics of shrinkage and swelling due to moisture movement through it with atmospheric changes and soil which has its grains in the form of platelet or sheet is termed as Black Cotton Soil. It easily yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement. This soil type will have very low bearing capacity and will be blackish in colour.

2.0 Workmanship and Mode of Measurements and Payment :

- 2.1 The relevant specifications of the item no. 1.01.a shall be followed except that excavation shall be done in Black cotton soil. The rate excludes refilling the trenches.

- 2.2 The rate shall be for an unit of one m³.

- 1.02.b Excavation for foundation for a depth of 1.5 to 3.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in Black cotton soil excluding refilling the trenches as per item no. 1.07, including dressing the base of trench etc. complete, as directed.**

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 1.5 to 3.0 m., in Black cotton soil. The excavation work from 1.5 m. to 3.0 m. shall be measured and paid under this item. The rate excludes trench filling.

- 1.02.c Excavation for foundation for a depth of 3.0 to 5.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in Black cotton soil excluding refilling the trenches as per item no. 1.07, including dressing the base of trench etc. complete, as directed.**

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 3.0 to 5.0 m., in Black cotton soil. The excavation work from 3.0m. to 5.0 m. shall be measured and paid under this item. The rate excludes trench filling.

1.02.d Excavation for foundation for a depth of 5.0 to 7.0 m., including sorting out and stacking of useful materials, disposing of the excavated stuff upto 50 m. lead, in Black cotton soil excluding refilling the trenches as per item no. 1.07, including dressing the base of trench etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 5.0 to 7.0 m., in Black cotton soil. The excavation work from 5.0m. to 7.0 m. shall be measured and paid under this item. The rate excludes trench filling.

1.03.a Excavation for foundation upto 1.5 m. depth, including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead, in dense or hard soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.

1.0 General :

1.1 Any soil which generally requires close application of pickaxes or jumpers or scarities to loosen it, stiff clay and cobble stone etc., fall under this category.

2.0 Workmanship and Mode of Measurements and Payment :

2.1 The relevant specifications of the item no. 1.01.a shall be followed except that excavation shall be done in dense or hard soil.

2.2 The rate shall be for an unit of one m³.

1.03.b Excavation for foundation for depth of 1.5 to 3.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead, in dense or hard soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 1.5 to 3.0 m., in dense or hard soil. The excavation work from 1.5 m. to 3.0 m. shall be measured and paid under this item.

1.03.c Excavation for foundation for depth of 3.0 to 5.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead, in dense or hard soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 3.0 to 5.0 m., in dense or hard soil. The excavation work from 3.0 m. to 5.0 m. shall be measured and paid under this item.

1.03.d Excavation for foundation for depth of 5.0 to 7.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead, in dense or hard soil including refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 5.0 to 7.0 m., in dense or hard soil. The excavation work from 5.0 m. to 7.0 m. shall be measured and paid under this item.

1.03.e Excavation for foundation for depth of 7.0 to 10.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead, in dense or hard soil including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 7.0 to 10.0 m., in dense or hard soil. The excavation work from 7.0 m. to 10.0 m. shall be measured and paid under this item.

1.04.a Excavation for foundation upto 1.5 m., depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead, in hard murrum including refilling the trenches as per item no. 1.07 etc. complete, as directed.

1.0 General :

1.0 The hard murrum shall be disintegrated rocks, which contain silicone material and natural mixture of clay of calcareous origin. The size of hard murrum will not be more than 20 mm.

2.0 Workmanship :

2.1 The relevant specifications of item no. 1.01.a shall be followed except that the excavation work shall be carried in hard murrum.

3.0 Mode of Measurements and Payment :

3.1 The relevant specification of item no. 1.01 shall be followed.

3.2 The rate shall be for an unit of one m³.

1.04.b Excavation for foundation for depth of 1.5 to 3.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead in hard murrum including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 1.5 to 3.0 m., in hard murrum. The excavation from 1.5 to 3.0 m. shall be measured and paid under this item.

1.04.c Excavation for foundation for depth of 3.0 to 5.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead in hard murrum including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 3.0 to 5.0 m., in hard murrum. The excavation from 3.0 to 5.0 m. shall be measured and paid under this item.

1.04.d Excavation for foundation for depth of 5.0 to 7.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. in lead in hard murrum including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 5 to 7.0 m., in hard murrum. The excavation from 5.0 to 7.0 m. shall be measured and paid under this item.

1.04.e Excavation for foundation for depth of 7.0 to 10.0 m., including sorting out and stacking of

useful materials and disposing of the excavated stuff upto 50 m. in lead in hard murrum including refilling the trenches as per item no. 1.07 etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 7.0 to 10.0 m., in hard murrum. The excavation from 7.0 to 10.0 m. shall be measured and paid under this item.

1.05.a Excavation for foundation upto 1.5 m. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in soft rock not requiring blasting, excluding refilling the trenches etc. complete, as directed.

1.0 Workmanship :

1.0 The relevant specification of item no. 1.01.a shall be followed except that the excavation shall be carried out for foundation upto 1.5-m. lift in soft rock not requiring blasting, excluding refilling the trenches.

1.1 The excavation in soft or disintegrated rock shall be carried out by crowbars, pickaxes or pneumatic drills or any other suitable means.

1.2 If the Contractor desires to resort to blasting, he can do so after obtaining prior permission from the relevant authorities, Engineer-in-charge but nothing extra shall be paid to him.

1.3 The materials available from soft rock excavation shall be properly stacked within 50-m. lead and 1.5 m lift and shall be the property of the Institute.

1.4 The classification of strata of the foundation excavated material shall be done by the Engineer-in-charge as per clause 301-2 of MORTH and shall be acceptable to the Contractor.

1.5 However, this shall include the type of rock and boulder, which may be quarried or split with crowbars. Laterite and conglomerate also come under this category.

2.0 Mode of Measurements and Payment :

1.0 The relevant specification of item no. 1.01.a shall be followed.

1.1 The rate shall be for an unit of one m³, excluding refilling the trenches.

1.05.b Excavation for foundation for depth of 1.5 to 3.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in soft rock not requiring blasting, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 1.5 to 3.0 m., in soft rock, excluding refilling the trenches. The excavation from 1.5 to 3.0 m. shall be measured and paid under this item.

1.05.c Excavation for foundation for depth of 3.0 to 5.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in soft rock not requiring blasting, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation

will be from 3.0 to 5.0 m., in soft rock, excluding refilling the trenches. The excavation from 3.0 to 5.0 m. shall be measured and paid under this item.

1.05.d Excavation for foundation for depth of 5.0 to 7.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in soft rock not requiring blasting, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 5.0 to 7.0 m., in soft rock, excluding refilling the trenches. The excavation from 5.0 to 7.0 m. shall be measured and paid under this item.

1.05.e Excavation for foundation for depth of 7.0 to 10.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in soft rock not requiring blasting, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.01.a shall be followed except that the depth of excavation will be from 7.0 to 10.0 m., in soft rock, excluding refilling the trenches. The excavation from 7.0 to 10.0 m. shall be measured and paid under this item.

1.06.a Excavation for foundation upto 1.5 m. depth, including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in hard rocks, using blasting and drilling, excluding refilling the trenches etc. complete, as directed.

1.0 Workmanship :

1.1 The relevant specification of item no. 1.01.a shall be followed except that the excavation for foundation work shall be carried out in hard rock, excluding refilling the trenches.

1.2 Excavation shall be done by blasting to the dimensions shown in the drawings or as directed. Unless otherwise specified, IS : 4081, safety code for blasting and relevant code for drilling operations shall be followed. As far as possible all blasting shall be completed prior to the commencement of construction. At all stages of excavation, precautions shall be taken to preserve the rock below and beyond the lines specified for excavation, in the soundest possible condition. The blasting shall be carried out only with written permission of the Engineer-in-charge. The Contractor shall obtain license from Public/District authorities for carrying out the blasting work. All the laws, regulations etc., pertaining to the precautions, acquisition, transport, storage, landing and use of explosives shall rigidly be followed. The magazine for the storage of the explosive shall be built as per the design and specifications of the explosive authority and shall be located at the approved location. Unauthorized persons shall not be permitted to enter into the magazine and when it is not in use, it shall be kept securely locked. No matches or inflammable materials shall be allowed to be taken into the magazine. However, the Engineer-in-charge shall have access to the magazine for checking the explosives and the accounts maintained by the Contractor. The magazine shall have an effective lightening conductor. The rules of explosive 1940 revised from time to time, shall be followed strictly for obtaining and handling the explosive and undertaking the blasting work. Explosives shall be kept dry and shall not be exposed to direct sunrays. Only the required quantity of explosive shall be brought to the site of blasting and the excess left after filling the holes shall be taken back to the magazine. In no case blasting shall be allowed closer than 30 m. to any structure or to locations where concrete has

just been placed. In the latter case, the concrete must be atleast 7 days old.

1.3 The Contractor shall be responsible for damage to property, workmen and public, due to any accident

on use of explosives and blasting operations. The quantity and strength of the explosive used, shall be such as will neither damage nor crack the rock outside the limits of excavation.

1.4.0 Precautions :

- 1.4.1 The blasting operation shall remain in charge of competent and experienced supervisor and workmen of the Contractor, per set of operation, who are thoroughly acquainted with the details of handling explosives and blasting operations. The blasting shall be carried out during fixed hours of the day, preferably during the mid-day/lunch hours or at the close of the work, as ordered in writing by the Engineer-in-charge. The hours of blasting shall be notified in advance to the people in the vicinity. The engineer in charge shall prepare all the charges only.
- 1.4.2 Red danger flags shall be displayed prominently in all directions before the blasting operations.
- 1.4.3 People except those who actually light the fuse shall be prohibited from entering into this area. The flag shall be stationed as much as 200 m. away from the firing site, in all directions and all persons, including workmen shall be excluded from the flagged area, atleast 10 minutes before the firing warning whistle being sounded for this purpose.
- 1.4.4 During excavation in rock by blasting, the lowest 15 cm. of the strata shall be blasted with light charges so as not to shatter or weaken the underlying rock on which the foundation will actually be laid. If excavation in rock is done to larger width and length than those shown on the drawings or as directed, no payment shall be made for such over break. If excavation is done to depth greater than shown on the drawings or as directed, excess depth shall be made up with foundation grade concrete, as directed, at the Contractor's cost.
- 1.4.5 The charged hole shall be drilled to the required depth with pneumatic drills. The drilling pattern shall be such that the rock pieces after blasting shall be suitable for handling without secondary blasting. In dry weather and normal dry excavation, ordinary low explosive like gunpowder may be used. In damp rocks, high explosive like gelatin, dynamite with detonator and fuse wire may be used. Under water or in rocks with substantial accumulated seepage water, electric detonator shall be used. When blasting is done with powder, the fuse shall be cut to the required length and shall be inserted in the holes and the powder dropped in. The powder shall be gently tamped with copper rod with rounded ends or wooden tamping rod with a flat end. The explosive powder shall then be covered with trapping materials, which shall be tamped lightly but firmly. When blasting is done with dynamite and other high explosive, dynamite/explosive cartridges shall be prepared by inserting the square cut ends of fuse into the detonator and finished with dippers at the open ends. The detonator should be gently pushed into the primer leaving 1/3rd of the copper exposed outside. The primer shall be housed into the explosive. Bore holes shall be of such size that the cartridges can be easily passed down. The holes shall be cleared of all debris before the explosive is inserted. A space of about 20 cm. above the charge shall then be gently filled with dry clay, pressed home and the rest of the tamping is firmed with any convenient materials gently packed with a wooden cover.
- 1.4.6 At a time, not more than 20 nos. of such charges shall be prepared and fired. The man in charge shall blow a whistle, in a recognized manner, for cautioning the people. All the people shall then be required to move at safe distances. The charges shall be lighted, preferably electrically, by the engineer- in- charge only. The man in charge shall count the number of explosions. He shall satisfy himself that all the charges have been exploded before allowing the workmen to go to the work site.
- 1.4.7 The Contractor shall be fully responsible to strictly follow the prevailing rules and procedures regarding blasting procedures. When blasting is done near any existing building or any other

property, it shall be done under cover and the Contractor shall make all necessary muffling arrangements. Covering may be preferably done with MS plate with adequate dead weight over them. Blasting shall be done with small charges only and where directed, a trench shall have to be cut by chiseling prior to the blasting operation, separating the area under blasting from the existing structures.

- 1.4.8 When excavation has almost reached the desired level, hand trimming shall be done for dressing the surface to the desired level. Any rock excavation beyond the limit of 75 mm. shall be filled up as directed by the Engineer-in-charge, with concrete of grade not less than M-150. The cost for the same shall be borne by the Contractor. Stepping in rock shall be done by hand trimming.

1.5 Misfire :

- 1.5.1 In case of a misfire, the following procedure shall be observed.

- 1.5.1.1 Sufficient time shall be allowed to account for the delayed blast. The man in charge shall inspect all the charges and determine the missed charge.

- 1.5.1.2 If it is the blasting powder charge, it shall be completely flooded with water. A new hole shall be drilled at about 45 cm. away from the misfired bore. This should blast the old charge. If it will not blast the old charge, then the above procedure shall be repeated till the old charge is blasted.

- 1.5.1.3 In case of charge of gelatin, dynamite etc., the man in charge shall gently remove the tamping and the primer with detonator. A fresh detonator and primer shall then be used to blast the charge. Alternatively, the hole may be cleared off for one foot of tamping and the direction of it shall then be ascertained by placing a stick in the hole. Another hole shall then be drilled 15 cm. away and parallel to it. This hole shall then be charged and fired so that the misfired hole should explode at the same time. The man in charge shall report to the office at once for all cases of misfire, the cause of the same and what steps were taken in connection therewith.

- 1.5.1.4 If a misfire has been found due to a defective detonator or dynamite, the whole quantity in the box from which defective article was taken must be sent to the authority, as directed for inspection to ascertain whether all the remaining materials in the box are also defective or not.

- 1.6 **Accidents :** The Contractor shall be solely responsible for any accident during the entire procedure of handling explosive and blasting and shall pay necessary compensation to persons affected or damage to lands or property etc., due to the blasting without extra claims on the Institute.

- 1.7 **Account :** A careful and day-to-day account of explosive shall be maintained by the Contractor, in an approved manner and shall be open to inspection of the Engineer-in-charge, at all times. Surprise visit may also be paid by the Engineer-in-charge, to the storage and in case of any unaccountable shortage or unsatisfactory accounting, the Contractor shall be liable to be penalized by forfeiture of part or whole of his security deposit or by cancellation of tender in which case he shall not be entitled for any compensation.

1.8 Disposal of Excavated Materials :

- 1.8.1 No materials excavated from foundation trenches of whatever kind they may be, are to be placed even temporarily nearer than 1.5 m. from the distance prescribed by the Engineer-in-charge, from the outer edge of excavation. All materials excavated shall remain the property of the Institute. The rate for excavation includes sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable and useful for back filling or other use shall be stacked in

convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach upon the area required for constructional purpose. The site shall be left clean of all debris on completion.

1.8.2 Disposal of excavated materials is subject to the following :

1.8.2.1 Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead of 50 m., as directed. Useful materials obtained from clearing site and excavation shall be stacked within a lead of 50 m., beyond the building, as directed. Materials suitable for back filling shall be stacked at convenient places within a lead of 50 m. from the structure for reuse. Useful stones from rock excavation shall be stacked neatly within a lead of 50 m. and will be allowed to be used by the Contractor, on payment at rates laid down in the contract or if not so paid down, at a mutually agreed rates.

1.8.3 If surplus materials are required to be conveyed beyond 50 m., conveyance will be paid for under a separate item.

2.0 Mode of Measurements and Payment :

2.1 The work shall be measured for the work limited to the dimensions shown on drawings or as directed. Excavation to dimensions in excess of the above will not be measured or paid for and if so ordered by the Engineer-in-charge, the Contractor shall have to fill up the excess depth with cement concrete specified for foundation, without extra payment.

2.2 Driving of sounding bards, drill holes to explore the nature of substratum upto a total length of meter, distributed in two or three places, in each foundation, if necessary, will be considered incidental work and will not be paid for separately. Shoring and strutting shall be provided, as demanded by the site conditions.

2.3 Removal of slips and blows in the foundation trenches will not be measured or paid for.

2.4 If it is necessary in the opinion of the Engineer-in-charge, to carry the foundation below the levels shown on the plans, the excavation for the first 1.5 m. of additional depth will be included in the quantity for the particular classification and will be paid for as extra work, at rate to be decided under the general conditions of contract, unless the Contractor is willing to accept the payment at tendered rates.

2.5 The rate shall be for an unit of one m³.

1.06.b Excavation for foundation for depth of 1.5 to 3.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in hard rocks, using blasting and drilling, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.06.a shall be followed except that the depth of excavation will be from 1.5 to 3.0 m., in hard rocks, excluding refilling the trenches. The excavation from 1.5 to 3.0 m. shall be measured and paid under this item.

1.06.c Excavation for foundation for depth of 3.0 to 5.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in hard rocks, using blasting and drilling, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.06.a shall be followed except that the depth of excavation

will be from 3.0 to 5.0 m., in hard rocks, excluding refilling the trenches. The excavation from 3.0 to 5.0 m. shall be measured and paid under this item.

1.06.d Excavation for foundation for depth of 5.0 to 7.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in hard rocks, using blasting and drilling, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.06.a shall be followed except that the depth of excavation will be from 5.0 to 7.0 m., in hard rock, excluding refilling the trenches. The excavation from 5.0 to 7.0 m. shall be measured and paid under this item.

1.06.e Excavation for foundation for depth of 7.0 to 9.0 m., including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 m. lead, in hard rocks, using blasting and drilling, excluding refilling the trenches etc. complete, as directed.

The relevant specifications of item no. 1.06.a shall be followed except that the depth of excavation will be from 7.0 to 9.0 m., in hard rock, excluding refilling the trenches. The excavation from 7.0 to 9.0 m. shall be measured and paid under this item.

1.07 Filling / Backfilling (only Up to Plinth works above Natural Ground level) with available selected/approved excavated earth the quantity of earth stacked anywhere inside the campus (excluding rock and black cotton soil) in foundation, trenches, plinth & plot etc, in layers not exceeding 15 cm. in depth, including breaking the clods, watering to optimum moisture content, ramming and compacting by mechanical means of suitable type of vibrator, including freight, transportation, loading, unloading, screening, passes etc. all complete as instruction & directions of the Engineer-in-charge (Consolidated measurements of fill shall be paid for under this item). The rates shall include for all leads and lifts including transporting using mechanical / manual means. Note: Using excess available excavated earth from foundations and dressing of the plot area. Note: Refilling for Foundation and trenches shall not be measured and paid for.

1.0 Workmanship :

1.1 The earth to be used for filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken to a size not bigger than 50 mm.

1.2 As soon as the work in foundation has been completed and measured, the sides of foundation shall be cleared of all debris, brick bats, mortar dropping etc. and filled with earth in layers not exceeding 15 cm. Each layer shall be adequately watered, rammed well and consolidated before the succeeding layer is laid. The earth shall be rammed with mechanical rammer of different capacity as per site condition.

1.3 The **plinth & plot** shall be similarly filled with earth in layers not exceeding 15 cm., adequately watered and consolidated by ramming with iron rammers & **mechanical compactor**. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

1.4 The finished level of filling shall be kept to shape and gradient, intended to receive any floor finish.

1.5 In case of large heavy duty flooring like factory flooring, the consolidation may be done by **vibratory / static rollers**, where so specified or as directed. The extent of consolidation required shall also be as specified or as directed.

1.6 The excavated stuff of the selected type only shall be allowed to be used for filling the **trenches, plinths and plot filling**. Under no circumstances, black cotton soil shall be used for filling the plinths.

2.0 Mode of Measurements and Payment :

2.1 The payment shall be made for filling in **plinth, sides of foundations & plot (if back filling is excluded in excavation Item)**. No deductions shall be made for shrinkage or voids, if considered as instructed above. Only consolidated measurements shall be paid.

2.2 The rate shall include the cost of mechanical compaction by compactors.

2.3 The rate shall be for an unit of one m³.

1.0 Materials :

1.1 Murrum or selected earth brought from outside shall be clean, of good binding quality and of approved quality obtained from approved pots/quarries of disintegrated rocks which contain silicones materials and natural mixture of clay of calcarious origin. The size of murrum shall not be more than 20 mm. and shall be approved by the Engineer-in-charge, before use. It shall conform to M-64.

2.0 Workmanship :

2.1 The relevant specifications of item no. 1.07 shall be followed except that the murrum or selected soil shall be filled in foundations and plinths in 15 cm. layers, including consolidating, ramming well, watering, dressing etc., complete.

3.0 Mode of Measurements and Payment :

3.1 The relevant specifications of item no. 1.07 shall be followed.

3.2 The rate includes cost of collecting and carting murrum or selected earth of approved quality with all lead, lift, **royalty** to Govt. and labour required for filling in foundations and plinth.

3.3 The rate shall be for a unit of one m³.

1.08 Filling, in foundation and plinth (under floors), with good quality coarse river sand, obtained from outside, including watering, ramming well, consolidating and dressing etc. complete all as per specifications and direction of Engineer-in-charge.

1.0 Materials: Sand shall conform to M-6.

2.0 Workmanship :

2.1 The relevant specification of item no. 1.07 shall be followed except that sand shall be filled in foundations and in plinth, under floors, including watering, ramming well, consolidating and dressing etc., complete.

3.0 Mode of Measurements and Payment :

3.1 The relevant specification of item no. 1.07 shall be followed.

3.2 The rate includes cost of collecting, carting good quality sand, with all lead, lift and labour for filling the same in foundations and in plinth, mechanical compaction.

3.3 The rate shall be for an unit of one m³.

B08 Providing & Filling in foundation and plinth (under floors, general development) with good quality coarse river sand obtained from outside, including watering, ramming well, consolidating and dressing etc. complete all as per specification, drawing and directions of engineer-in-charge.

The relevant specifications of item no. 1.08 shall be followed.

1.09 Filling, with good quality cinder concrete of 1:4:8 (1 cement , 4 sand, 8 cinder), as and where directed by the Engineer-in-charge, in sunks in layers of 15 cm. thickness, including watering, ramming well etc. complete, as directed.

1.0 Materials :

1.1 Cinder shall be of best quality (**steam coal**) and shall conform to latest relevant IS specifications.

1.2 All relevant specification of item no. 1.07 shall be followed same except that cinder shall be used instead of excavated earth.

1.10 Providing and laying rubble soling using black trap, of thickness 15 cm. (compacted) or as specified, in plinth and for plinth protection, using 90 to 150 mm. cut size stones, covering and leveling the surface with a layer of good quality coarse river sand after filling the voids (25% of volume of soling) with smaller sized stones 20-40mm, 40-63mm, 63-90mm, 90-150 mm (i.e. Graded stone) size of stone/metals or stone chips, including watering, suitable means of ramming well and consolidating each layer by roller, all as per the specifications and direction of Engineer-in-charge.

1.0 Materials :

1.1 Stone and stone chips shall conform to M-16 and sand brought from outside shall be clean, of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rocks which contain silicones materials and natural mixture of clay of calcareous origin. **The sand shall coarse and shall be approved by the Engineer-in-charge. It shall conform to M-6.**

2.0 Workmanship :

2.1 The relevant specification of item no. 1.07 shall be followed except that first layer of stone, of average size 100 to 150 mm. shall be laid in plinth and for plinth protection. Thereafter, the voids between the stones laid in the first layer shall be filled by hand packing the stones of smaller size or stone chips of the same stones, as directed. The voids shall be filled with 20-40mm, 40-63mm, 63-90mm size of stones. The layers then shall be rammed well and consolidated.

2.2 The surface of the stone layer then shall be covered and leveled with a layer of **good quality coarse river sand**. This shall then be watered and well consolidated using power driven rammers or rollers, as directed. The consolidated thickness of the above layers, totally, should be average 15 cm. thick.

3.0 Mode of Measurements and Payment :

- 3.1 The relevant specification of item no. 1.07 shall be followed.
- 3.2 The rate includes the cost of collecting, carting stones and **river sand**, with all leads, lifts and labour for laying, hand packing and consolidating the same in plinth.
- 3.3 The rate shall be for an unit of one m³.

- 1.11 Providing and injecting Chemical emulsion for pre constructional anti-termite treatment for all types of structure with / without basement with RCC foundation/ RCC wall or with load bearing walled foundation or developing areas tree pits, water body etc. all as per specifications. The chemical used shall be chloropyriphos (1:19) of M/s HILBAN or Dursban TC all as per latest IS code no 6313 (Part II) . Plinth area of Building in plan at Ground Floor shall only be measured and paid. A guarantee bond of 10 years shall be furnished. Rate shall be inclusive of material required for Anti Termite Treatment and labour for applying.**
- a) Bottom surface and the sides of the excavation made for masonry foundations at the rate of 4 liters/ of surface area (wherever applicable).
- b) At the rate of 7.5 liter/ Sqm of surface area to the backfill at the depth of 500mm below the original ground level. The soil in the immediate contact with the vertical surface of RCC column shall be treated.
- c) Top surface of the plinth filling at the rate of 5 liter/Sqm of internal plinth area etc. complete.
- d) Internal vertical surface from original Ground level to top of the earth filled in the plinth at the rate of 7.5 liter/Sqm of surface area in contact.
- e) at the rate of 7.5 liter/ Sqm to the external vertical surface below finished Ground level to the full depth of the filling complete by injecting chemical after drilling the holes of 12 to 15mm dia, with depths of approx. 300 to 600 mm and at 150mm centre to centre and as close to the wall as possible.
- f) All holes for electrical data, water supply, drainage etc. shall be treated.

1.0 Materials :

The chemicals used for the soil treatment shall be only one of the following, with concentration shown against each, in aqueous emulsion.

Chemical Concentration :	1. Chloropyriphos 20%
	2. Dursbun of Nocil
	3. Kannodene of Kanoria
	4. Lindane of Kanoria

2.0 Workmanship :

- 2.1 The chemical barrier shall be complete and continuous under whole of the structure to be protected.
- 2.2 The bottom and the sides of foundation upto a height of 30 cm. from the bottom of excavation made for masonry foundation and for basement, and also for plinth level before floor concrete shall be treated with the chemical emulsion at the rate of 5.0 liters/m² ^{20 EC} of the surface area. Periphery treatment before plinth protection at the rate of 7.5 lit chemical emulsion 20 EC per meter length as per IS code or PCI standards, **etc complete all as per the SOQ.**
- 2.3 The chemical treatment shall be carried out when the surface is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil is wet with rain water or sub soil water.
- 2.4 Once formed, treated soil barriers shall be not disturbed. If disturbed, immediate steps shall be taken

to restore the continuity and compactness of the barrier system.

- 2.5 The treatment against termite infection shall remain effective for a period not less than 10 years, from date of issue of the final certificate of completion of work. If at any time during this period, any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed, the Contractor shall rectify the concerned defects within 15 days on receipt of notice from Engineer-in-charge. On Contractor's failure to do so, the Engineer-in-charge may get the same rectified through any other agency at the Contractor's risk and cost, and the decision of Engineer-in-charge as to the cost payable by the Contractor for the same shall be final and binding to the Contractor.
- 2.6 A guarantee bond on Twenty Rupee stamp paper shall be given by the Contractor to the institute, in the manner form described below :
- 2.7 Reconciliation of chemicals brought on site and treated area shall be submitted on completion of job.

FORM OF GUARANTEE BOND

"I/We(Contractor) hereby guarantee that work will remain unaffected and will not be in any way damaged by termite or any other germs of similar types, for a period of 10 years after completion of the work of anti-termite, as per the terms and conditions of the contract and the Contractor hereby indemnifies and agrees to save the Institute from any loss and or damage that might be caused on account of termite and or other similar type of germs and hereby guarantees to make good any loss or damages suffered by the Institute and further guarantees to redo the affected work without claiming any extra cost."

- 2.8 This guarantee shall remain force for the period of 10 years, from the completion of the work under the contract and it shall remain binding to the Contractor for period of 10 years.
- 2.9 The deposit at the rate of 50% of the cost of this item from the running and final bills shall be recovered and retained for the first one year after virtual completion of the work.
- 3.0 Mode of Measurements and Payment :**
- 3.1 The plinth area at ground floor shall be measured and paid. No deduction shall be made nor extra paid for any opening for pipes, etc., upto 0.1 m². The rate shall include the cost of all labour and materials required for the operation involved for satisfactory completion of this item.
- 3.2 The rate shall be for an unit of one m².

B09 Providing and injecting Chemical emulsion for pre constructional anti-termite treatment for all types of structure with / without basement with RCC foundation/ RCC wall or with load bearing walled foundation or developing areas tree pits, water body etc. all as per specifications. The chemical used shall be chloropyriphos (1:19) of M/s HILBAN or Dursban TC all as per latest IS code no 6313 (Part II) . Plinth area of Building in plan at Ground Floor shall only be measured and paid. A guarantee bond of 10 years shall be furnished. Rate shall be inclusive of material required for Anti Termite Treatment and labour for applying.

a) Bottom surface and the sides of the excavation made for masonry foundations at the rate of 4 liters/ of surface area (wherever applicable).

b) At the rate of 7.5 liter/ Sqm of surface area to the backfill at the depth of 500mm below the original ground level. The soil in the immediate contact with the vertical surface of RCC column shall be treated.

- c) Top surface of the plinth filling at the rate of 5 liter/Sqm of internal plinth area etc. complete.
- d) Internal vertical surface from original Ground level to top of the earth filled in the plinth at the rate of 7.5 liter/Sqm of surface area in contact.
- e) at the rate of 7.5 liter/ Sqm to the external vertical surface below finished Ground level to the full depth of the filling complete by injecting chemical after drilling the holes of 12 to 15mm dia, with depths of approx. 300 to 600 mm and at 150mm centre to centre and as close to the wall as possible.
- f) All holes for electrical data, water supply, drainage etc. shall be treated.
Complete all as per direction of engineer in charge.

The relevant specifications of item no. 1.11 shall be followed.

1.12.a Disposing of the surplus excavated earth and/or debris etc. including loading at site, transporting by mechanical or manual means & disposal, unloading, spreading and dressing and compacting etc. complete, as directed beyond the initial lead of 50 m. with in the plot Area all as per specifications and direction of Engineer-in-charge. For civil, plumbing & electrical works.

1.0 Workmanship :

1.1 The surplus excavated earth shall be disposed off as and when directed by the Engineer-in-charge, **within the plot area**. lead. The site to which the excavated earth should be disposed off shall be specified by the Engineer-in-charge. The disposal of the stuff includes loading the earth in vehicle, conveyance to the specified site, unloading and spreading the same. The Contractor should contact the Engineer-in-charge before disposing the material, i.e. when the trucks are being loaded for disposal. Every time the truck is loaded, the Engineer-in-charge shall check whether it is loaded properly to the pre-decided level and then note its number in the register used to keep the record of the trips made by the same truck.

2.0 Mode of Measurements and Payment :

2.1 The work shall be measured as 75% of the quantity, in m³, loaded in a single truck. The total no. of trucks shall be taken from the register and the quantity shall thus be calculated for **adhoc certification** The total measurement shall be in m³.

2.2 The rate includes for spreading, dressing etc. complete, at the specified site and shall be for an unit of one m³.

2.3 The final measurements (QTY) shall be calculated from reconciliation.

1.12.b Disposing of the surplus excavated earth and/or debris etc. including loading at site, transporting & disposal, unloading, spreading and dressing etc. complete as directed beyond the initial lead of 500 m. to 1.0 km.

The relevant specifications of item no. 1.12.a shall be followed except that the lead will be from 500 m. to 1.0 km.

1.12.c Disposing of the surplus excavated earth and/or debris etc. including loading at site, transporting by mechanical or manual means & disposal, unloading, spreading and dressing etc. complete, as directed out side the plot area. site (non objectionable place) to be found and selected by the contractor all as per specifications and directions of Engineer-in-charge. For civil, plumbing & electrical works.

The relevant specifications of item no. 1.12.a shall be followed, disposing surplus earth anywhere outside plot boundary **(Non objectionable place) to be found and selected by the contractor.**

- 1.13b Carrying out pre anti termite treatment with anti termite chemicals like aldrin, heptachlor, chlorophyriphos 20 EC in two parts i.e. at plinth level and at periphery of the building as per IS : 6313 (Part I - III)-1981, 1st revision, as directed.**

Relevant specification of item no 1.13a shall be followed except that the treatment shall be done in two parts i.e. at plinth level and at periphery of the building.

- 1.13c Carrying out plinth treatment to post construction/existing structure, by spraying chemical solution for termite control treatment, including Labour and material consistance with IS specifications.**

1.0 Materials :

- 1.1 The relevant specifications of item 1.13.a shall be followed.

2.0 Workmanship :

- 2.1 The relevant specifications of item 1.13.a shall be followed except that the top surface of the consolidated earth within the walls shall be treated with the chemical emulsion, at the rate of 7.5 liters/m². of the surface area, before the sand bed or sub-grade is laid. If the filled earth has been well rammed and the surface does not allow the emulsion to seep through, hole upto 500 to 750 mm. deep, at 3000 mm. centers, both ways, may be made with 12 mm. diameter MS rod, on the surface to facilitate absorption of the emulsion.

- 2.2 The Contractor shall give a Guarantee bond in the form described in item no. 1.13.a to the Institute, on a twenty-rupee stamp paper, duly signed.

3.0 Mode of Measurements and Payment :

- 3.1 The actual treated plan area shall be measured and paid.
- 3.2 No deduction shall be made nor extra shall be paid for any opening for pipes, etc. upto 0.1 m². The rate shall include the cost of all labour and materials required for the operation involved for satisfactory completion of this item.
- 3.3 The rate shall be for an unit of one m².

B02 Clearing of the site and roughly dressing the same using mechanical means or manual means, including removal of the roots, vegetation, grass, brush wood, trees up to girth of 30 cm measured at 1.00 m above ground level, sapling of girth, rubbish and disposing the same outside the Institute Campus. The Constractor is solely resonsible to find out unobjectionable palce out side institute campus

1.0 Materials : NA

2.0 Workmanship :

Clearing of site densely covered with shrubs, hedges, brushwood, small and huge trees having girth

over and upto 100 cm. the Engineer-in-charge, if finds necessary shall direct the Contractor to clear the site using mechanical equipment like bulldozer etc. Before commencing the work, the necessary permission from the Govt./Forest Department shall be taken by the Contractor, at his own expense. The clearing shall include cutting down all vegetation, including trees such as Coconut trees and Palms of any girth sizes and digging out their roots. The cut down trees shall be the property of the Institute. All the materials cleared shall then be disposed off, at the site specified by the Engineer-in-charge.

3.0 Mode of Measurements and Payment :

The rate shall include clearing, loading, conveying, unloading and spreading. Clearing shall be measured in m² of the actual area cleared.

1.14.a Do - as above but disposing and stacking the debris beyond the initial lead of 50 m. upto 500 m.

The relevant specifications of item no. 1.14.a shall be followed except that the cleared debris shall be disposed within a lead between 50 m. to 500 m.

1.14.b - Do - as above but disposing and stacking the debris beyond the initial lead of 500 m. upto 1.0 km.

The relevant specifications of item no. 1.14.a shall be followed except that the cleared debris shall be disposed off within a lead between 500 m. to 1.0 km.

1.15 Felling trees of the following girth (measured at a height of 1 M above ground level) including cutting of trunks and branches removing the roots, filling the pit and depression, stacking of the serviceable materials and disposal of unserviceable material etc., as directed for: (the necessary permission for cutting the same should be obtained by the contractor from relevant authority).

1.15.a. Felling trees beyond 30cm up to including 60cm girth.

1.15.b. Felling trees beyond 60cm up to including 120cm girth.

1.15.c. Felling trees beyond 120cm up to including 240cm girth.

1.15.d. Felling trees beyond 240cm upto including 400cm girth.