

Technical Specification

**WORKS AT
MAHINDRA WORLD CITY, JAIPUR**

1.0 DESCRIPTION OF SITE AND PROJECT

1.0 BRIEF PROJECT DESCRIPTION

CLIMATE:

(a) TEMPERATURE:

The Jaipur lies on 442m above sea level the prevailing climate in Jaipur is known as a local steppe climate. During the year there is little rainfall. The hot season lasts for 2.5 months, from April 14 to June 30, with an average daily high temperature above 97°F. The hottest day of the year is May 25, with an average high of 104°F and low of 82°F. The cool season lasts for 2.4 months, from December 5 to February 16, with an average daily high temperature below 77°F. The coldest day of the year is January 6, with an average low of 48°F and high of 70°F.

(b) RAIN FALL, HUMIDITY:

Jaipur experiences extreme seasonal variation in monthly rainfall. The rainy period of the year lasts for 5.0 months, from May 15 to October 15, with a sliding 31-day rainfall of at least 0.5 inches. The most rain falls during the 31 days centered around August 2, with an average total accumulation of 6.1 inches.

The rainless period of the year lasts for 7.0 months, from October 15 to May 15. The least rain falls around December 3, with an average total accumulation of 0.1 inches.

(c) ACCESS TO SITE:

The site is Located within the Municipal limit of Jaipur, The project is situated in the southern west part of Jaipur and extends over 3000 acres adjoining the NH-8

(d) PROJECT LAYOUT:

Project layout for the contracts is given in the drawings.

(e) **EXPECTED CONSTRUCTION PERIOD:**

Expected construction period for the contracts is as laid in GCC

(f) **FACILITY AND SERVICES PROVIDED BY THE EMPLOYER:**

Free access to the work sites will be assured by the Employer.

The appointed contractor will organize for the supply of water and electricity during the period of works completion. Subsequently, during the period of maintenance, the employer will provide for the same. Contractor to price accordingly.

2.0 SCOPE OF WORKS

2.1 SCOPE OF WORKS

All the Soft cape works, pertaining to the Landscape works, will have to be done at **MWCJ, JAIPUR** . as per the special conditions of the contract. The entire project area is primarily low fertile with the basic nature of the soil being brown soil and minimum percolation which allows selective vegetation. While utmost care has been taken on landscape proposal for the area but plantation works require dedicated effort for ensuring survivability of the planting materials requires appropriate level of expertise and experiences in handling of the work .The landscape shall be in stages, primarily as per the availability of the site after completion of the Road Works on the desired stretch. The broad scope of work is mentioned as below while the detailed performance of the contractor shall be gauged based on the schedules as provided in the “**Conditions of Contract and Specification**”.

a) SPEEDY WORK:

Follow-up with the road Contractors for handing over of the site in desired state for speedy landscape works. Owner shall not be responsible for any delay on account of the said reasons whatsoever.

b) SITE CLEARANCE:

The landscape Contractor shall ensure the area of concern to be cleared of all the unwanted materials like cement mix, aggregates, debris, and wastes of any type or left over of the civil contractors before starting his work. The same should be cleared off by the civil contractor and to be followed-up by the landscape contractor. In-event of the same not being removed off the site by the civil contractors, Landscape Contractor shall be required to get the undesirable waste including wild vegetations cleared off the off the site as per instruction of the Site-In-Charge. The site clearance and preparation shall be at no additional cost but form the part and parcel of the landscape works. The site shall be signed off for landscape works only after signoff by the Site-In-Charge on joint inspection with the Landscape Contractor.

c) SOIL PREPARATION:

Rough grading and earthworks per section of the specification. This work shall include the supply, placement, shaping of earth worms, and or excavation and removal of unwanted soils to tip, as may be required and as indicated in the grading drawings, details and tender documents. This section includes the setting and formation of rough grading to plus or minus 15cm with suitable materials to achieve the level, worms and earth contouring as indicated in the drawings and documents. This section includes the fine grading to finish levels to plus or minus 25mm. The contractor shall be responsible for plantation works in the right soil medium (pH-value not exceeding 7.5) besides other chemical composition suitable for planting materials. The contractor shall be required to get the proposed good soil tested as recommended & accepted by the owner for entire Landscape site at definite intervals (As per instruction of the site-in-charge) as per instruction of the Site-In-Charge.

Also, the soil test shall be for the final mixture ready for plantation and should be reported appropriate for plantation works. The test will be conducted on behalf of the contractor by the owner and shall be liable for deduction from the landscape bill as raised by the contractor on plantation works.

Also, the contractor shall be required to create landforms (mounds & worms) as per drawing and instruction of the site-in-charge for facilitation of the drainage and aesthetic value in the landscape area. This section includes the fine grading to finish levels to plus or minus 25mm. The payment shall be based on the total volume of the earthworks payable in cu.mt.

d) PLANTATION WORKS:

The landscape contractor shall be required to complete the plantation works as per the planting schedule

e) EXISTING TREES:

The landscape contractor is required to assess and take over maintenance works of existing fully grown trees within that work site.

f) MAINTENANCE WORKS:

The contractor shall be responsible for maintenance of the Plantations works for a period of one year after handover. The cost of fertilizer, pesticides, manure, and labour will be included in the quotation.

3.0 SPECIFICATION

SPECIFICATION**3.1. GENERAL -TERMS OF REFERENCE FOR WORK EXECUTION****Terms of Reference Description****a) Design & Details**

Contractor must work as per the designs and lineout details provided by Landscape Consultant. Difficulty on site in execution as per the plan/ design must be brought to the notice of site-in charge immediately.

Any discrepancies in the design subject to execution hurdles and alteration required should be reported to site-in-charge and the same should be improvised by the landscape consultant or as per instruction of the site-in-charge and contractor shall have to work only after due approval of the modification.

b) Landscape**Site Preparation**

The landscape site should be free of any Construction Debris or wild vegetation. It shall be responsibility of the contractor to ensure that the site is in working condition as per instruction of the site-in charge. The contractor shall also ensure proper grading of the landscape site in terms of aesthetics as well as drainage providing mounts and slopes with a gentle slope towards natural drainage direction All rubbles and debris if any and dispose it of in the suitable location possibly in low lying areas as identified by the contractor and approved by site-in-charge.

c) Soil Testing

The Soil to be used as Topsoil (Good Soil/earth) for all plantation works shall be primarily imported fertile soil from agriculture fields off the site. The contractor should get the soil test report and accordingly with experts and consultants would meet the requirement for additives and soil conditioner to possibly maintain pH value of the soil between 7.0 - 7.5 before plantation works. Also, after every 6 months or as required on poor performance of the plantation shall accordingly get the soil tested and measures taken for maintaining the pH value within acceptable range. Also, Contractor shall undertake treatment as per advice of the experts to soil conditioning during the entire maintenance period

d) Manpower Employment

Contractor should employ qualified & experienced garden supervisors and adequate number of gardeners to maintain the quality of garden and tree plantation to the satisfaction of Horticulture Department. A senior supervisor [M. Sc. (Horticulture) or B.Sc.(Agriculture) with 5 Years of relevant & similar work experiences. should be deputed as an overall in-charge of the whole contract who will ultimately report to the Site-In-Charge The deployment of the

maintenance staff should be adequately provided as per the Schedule of the Maintenance Staff.

e) Handing Over

The complete work can be chosen for completion in stages provided the same is submitted as a structured schedule for work completion showing stage completion as milestone before start of the work and hence approved by the site-in-charge. The stage completion of the work shall be deemed as part completion and liable for maintenance period of the contract agreement. However, final completion liable for issue of the virtual completion of the work shall be only after completion of the total work.

f) Billing

Running Bill shall be raised based on virtual completion of the partial scope of work as milestone completion of the work order value.

Final billing will be done on the basis of actual quantum of work done.

Tree /Delonix regia/Peltaphoram Plantation would be considered as per number of trees Shrubs/Ground Covers/lawn plantation would be considered as per area in Sq.mt with spacing of shrubs as per specification provided in the drawing/BOQ. The quoted rates to include all taxes applicable, water, electricity, labour, labour related expenses, safety related items.

g) Penalty

For evaluation of maintenance work, a joint inspection will be carried out on 25th day of every month or the 1st working day after the schedule date.

- i. Damage to lawn/ hedges/ edges/ ground covers etc.: Term 'Damage' represents any kind of unhealthiest or un-acceptable look to the garden features. A fine of **Rs.600/- per sq.mt** shall be imposed on unhealthiness /mortality of the shrubs on basis of the plantation bed. The contractor shall be required to attend special care to the plantation bed. In absence of proper care and attention, the plantation bed not in state of acceptance by Site-In-Charge, further fine of **Rs.60/- per/ Sq/mt/week** shall be levied till the period the state is re-instated into good health by application of fertilizers/insecticides/pesticides . In case of the plants suffering mortality, the same shall be replaced immediately to avoid penalty.
- ii. Dieing of Designated trees: the term 'Designated Tree' represents the new plantation or the trees computed for their maintenance during joint inspection after award of contract. Death or Poor maintenance state of trees will cause fine @ **Rs. 600/- per tree** at the end of the month. The trees have to be supplied and planted at the respective

location at the earliest, failing which will lead to increase in penalty by 10% **per Tree** upto the time the tree is replaced. The fine shall be deducted from the quarterly stage payment.

The lawns shall be maintained green with the desired maintenance effort. The contractor shall be liable for being fined in event of the lawns not performing as desired by the owner. The fine shall be **Rs.60/- per sq.mt** of the lawn area not found acceptable or dead.

h) Disposal of Waste- General Cleanliness of Landscape Site

The arrangement of transport for disposal of waste, shifting of plants, etc. has to be made by the contractor. The generated waste has to be disposed of within 48 hrs. of generation or as instructed. Failing which arrangement shall be made for disposal of the same by the company at risk and cost of the landscape contractor. It is the contractor's responsibility to keep the area in green, healthy and in proper condition all the time. owner will provide the place for disposal of garden waste within premises for Vermicomposting to be compulsorily adopted by the Contractor

i) Provision for Water

For Trees-@ 20 ltrs/every alternate day of watering should be provided to each of the tree planted.

For Shrubs-@15 ltrs/sq.mt/every alternate day of watering should be provided by the contractor

For Lawns-@ 25 liters/sq.mt/weekly requirement of watering should be provided by the contractor

The maintenance of tankers or any appropriate system shall be integral responsibility of the Contractor to meet the watering requirements of the Trees, shrubs and lawns under any circumstances during the planting period.

j) Electricity

It will be Contractor's responsibility to make arrangement for Electricity/Diesel Generator set to meet their requirement.

k) Maintenance

The Contractor shall adhere to the maintenance schedule During the maintenance period of all the Plants, contractor shall be responsible for any replacement towards mortality and the trees or the area of the plantation under shrubs/creepers/ground covers etc should be in healthy condition during the inspection conducted by the site-in charge on every 25th day of the month to avoid the penalty clause (g) and also subsequently amounting to holding of the payment due for quarterly instalment.

Contractor shall maintain record of maintenance & operations on site and submit daily report for all the areas certified for virtual completion of the work. Also, the contractor shall take note of the observation of the site-in-Charge or his representative/Horticulturist and seek compliance of the same at the earliest before nearest schedule to avoid any penalty as per penalty terms

l) Reports

The Contractor shall maintain weekly report on the deployment details as well as work planned for the day to the Site-In-Charge in prescribed format. All instructions and activities shall be recorded as per the desired format. Any problem or hindrance shall be brought to notice in the weekly report along with evidence in form of photographs. Also, the contractor shall always be required to maintain Stock Register for the planting material sourced to Owner's site and Supply for plantation in the Nursery maintained by the Contractor.

m) Nursery

Maintenance Office Set-up

The Contractor shall be required to set-up Office for its staff and Temporary Nursery with good micro-climate to store the supply of the plants. In case of propagation of the plants in the nursery, the same shall be used on site only.

n) Vermi-Composts

Contractor shall mandatory have Vermi-Composting System developed at appropriate location where all the pruning wastes, organic wastes shall be dumped with weeds, weed seeds or bulbs, stones etc., mix it well in the soil in the ratio (6:1), level as per grade.(point of unloading 0-50m). The process shall be requiring approval of the site-In-Charge and periodic maintenance of the activity. Approval of site in charge prior to dispatch of material for use on site is must.

o) Payment Schedule

The Payment shall be processed on the basis of the area handed over after development and planting as completion of the milestone .The certificate and the date there in for the virtual completion of the work shall entitle the contractor for continuance of the maintenance for 12 months. Payment Terms based on the item rates for the quantum of the certified virtual completion of the work shall be as per condition of contract

The site-In-Charge shall be fully empowered to hold the payment in case the contractor is observed negligent to the maintenance works, mortality of plants not attended by the contractor for immediate replacement of the same by healthy plants.

3.2. PLANTING SCHEDULE

3.2 A TREE PLANTATIONS

Sl.No Terms of Reference Instruction & Procedures

a. Supply of Trees

i. Physical Condition

All plant materials shall be healthy, sound, vigorous with good foliage, Plants supplied shall be conforming to the names listed on the plant list. No plant materials will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted

ii. Health of Trees

All plant materials shall be free from plant diseases, insect pests, or their eggs, and shall have healthy well-developed root systems. Plant material shall be well formed and shaped true to type and free from disease, insect and defect such as knots, windburn, sun-cold, injuries, abrasion or disfigurement.

iii. Specification of Trees

In no case, the specification of the material in terms of height, Girth & Foliage as mentioned in the BoQ shall be acceptable for plantation works. In case of in- availability of the particular species or the planting material as per specification in BoQ ,the alternate species or lower specification as the case may be shall have to be approved by site-uncharged in special case after due confirmation of the landscape consultant.

Lower Specification as mentioned in the BOQ accepted by the site-in-charge under special condition shall be re-negotiated for a lower rate depending upon the specification of the plants sourced by the contractor.

b) Planting of Trees

i. Pit Size:

Minimum Pit Size for all trees should be of the size as specified in BOQ. In case of larger trees pit size should be of as specified in BOQ.

ii. Soil Preparation:

Preparation of tree pits:

The soil shall be essentially good Earth mixed with 1/3rd of decomposed farmyard manure along with additives like Gypsum, Sulphur ,Zinc Sulphide (ZnS)etc. or as

specified in BOQ to maintain ph.-value of the soil between 7 - 7.5.

iii. Planting of trees:

Planting of trees and stacking / propping to protect the trees from wind and irrigate on need basis. Maintain the tree basins - free of weeds by regular hoeing. Planting the tree with root ball in the pit (tin grown / poly bag grown) after removing carefully and without disturbing the root. Pressing the soil firmly around the tree planted. Preparing the basin around the tree and watering after staking and tying. The plant should be well maintained, disease free, well trimmed at the time of handing over. In case of death of the plant the contractor needs to replace the same with equally well grown healthy plant.

iv. Stacking / Propping:

To ensure protection from Winds-staking/ propping it with bamboo tripod using jute string. In all condition, tree should be standing in erect position the staking should have anti-termite treatment.

v. Fertilizers /organic solid manures and liquid manures, spray bio insecticides, parasites, predators:

All the planting materials shall be periodically examined for termite attacks or plant disease and appropriate measure (application of liquid manures/ growth regulators/ pesticides as per need, weeding regularly so as to keep the plant healthy all the time) shall be undertaken for entire period of the contract... Required at the time of Plantation and entire period of maintenance as per Maintenance Schedule

vi. Watering Arrangement

Making basin around Trees (1mtr dia clear space) and maintaining Tools and Tackles/Hosepipes, tractor mounted Water Tankers or as required in sense all arrangement for water distribution and watering equipment's/manpower to be managed by the Contractor for watering the trees.

c) Handing Over of Trees

i. Name Plate for Trees

All Trees planting should have Name Tag with name of the relevant species and well placed on trees with good visual characteristics .In case of row plantation of similar species, the same can be repeated at definite intervals may be on every 5th tree from the start.

d) Maintenance of Trees

i. Maintenance of Trees

Apart from the essential watering of the plants as per the maintenance manual, Nurture the trees with organic solid manures and liquid manures, spray bio insecticides, parasites, predators to protect the trees from pest and disease. Amend the soil on regular basis with proper soil amendments to keep the pH level between 7 - 7.5 after completion of (12)Twelve month maintenance period the plants should be maintained by regular watering, weeding, replacing dead plants, applying pesticides, Use of plant physical protection measures etc. so as to grow them vigorously. Newly Planted should be maintained by

- a. Watering every alternate days @ 20 liters/watering cycle
- b. Applying FYM @ 10kg/ tree/ annum
- c. The Trees should have proper staking so as the tree should stand erect till the Tree settles with no possibility of bending due to Wind or Rain
- d. Trimming, pruning as & when required under guidance of the site-in-charge etc.

3.2 B SHRUBS PLANTATIONS**a) Sl.No Terms of Reference Description****b) Supply of Shrubs, Creepers, Ground Covers**

Health of Shrubs/Ground Cover/Creepers etc.

Plant material shall be well formed and shaped true to type and free from disease, insect and defect such as knots, windburn, sun-cold, injuries, abrasion or disfigurement.

Physical Condition

All plant materials shall be healthy, sound, vigorous with good foliage, and free from plant diseases, insect pests, or their eggs, and shall have healthy well-developed root systems. Plants supplied shall be conforming to the names listed on the plant list. No plant materials will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted.

Specification of Shrubs

The species should be in appropriate specification in terms of height & Foliage as provided in BOQ. Species below specification shall be liable for deduction of the item rate as agreed upon.

c) Planting of Shrubs, Creepers, Ground Covers Bed Sizes

As per the specification and depth should be minimum 300 mm deep exclusive of the top 50mm where top edge is defined for watering and flooding. The plantation bed shall be the

basis of all billing purpose including maintenance charges to be paid to the contractor

Soil Preparation

Dig and remove all weeds, debris, rubbles, and stones from 18" depth of the surface soil level to be maintained in due course. The soil shall be essentially good Earth mixed with 1/3rd of decomposed farmyard manure along with additives like Gypsum, Sulphur etc. to maintain ph-value of the soil between 7 - 7.5.

Preparation of soil for grass, ground cover, edges, shrubs and flower beds: . Then prepare the same soil with 2-3" thick layer of well decomposed, weed free farmyard manure or vermicompost. Treat the soil with chlorpyrifos / Lindane / Neemcake depends upon the infestation of soil borne pests. Treat the soil with proper herbicide to control the weeds only on need basis. Finally level the soil as per the drawing or planting details.

Preparation of pits for shrubs, creepers and hedges : The bed shall be prepared with good earth mixed with 1/3rd quantity of decomposed farmyard manure along with Planting a sapling of shrubs, ground covers, lilies, suckering plants etc. as per design plant spacing – 30-60 cm. maintaining(application of liquid manures/ growth regulators/ pesticides as per need,

Weeding - regularly so as to keep the plant healthy all the time) it for a period of 12 Months days from the date of virtual completion of development work Planting shrub/ground cover- Planting of shrub in the bed prepared earlier by filling garden soil and manure (67:33 ratio).Planting the shrub with root ball in the pit (tin grown / poly bag grown) after removing carefully and without disturbing the root. Pressing the soil firmly around the tree / shrub planted. Preparing the bed around the shrub and watering after staking and tying. Maintenance of shrub/ground cover up to 12(Twelve)months by regular watering and attending the inter-cultivation practices such as weeding, racking, watering gap filling ,free of weeds by regular hoeing. etc.

The plant should be well maintained, disease free, well-trimmed at the time of handing over. In case of death of the plant the contractor needs to replace the same with equally well grown healthy plant. Nurture the shrubs/ground cover with organic solid manures and liquid manures, spray bio-insecticides, parasites, predators to protect the trees from pest and disease. Amend the soil on regular basis with proper soil amendments to keep the pH level between 7 - 7.5 Planting hedges / edges - Planting of hedge / edge in the ground prepared earlier by filling garden soil and manure Preparing a pit of require size (for accommodating the root ball of plant) Planting the plants in 2/3 rows (as per instructions) at specified distance with root ball removed carefully and without disturbing the root ball from poly bag. Pressing the soil firmly around the plant Preparing the basin for watering. Maintain hedge / edge up to two months by regular watering and attending the inter-cultivation practices such as weeding, raking, gap filling, trimming and pruning etc. The hedge / edge should be well maintained, disease free, well-trimmed at the time of handing over. In case of death of the plant the contractor needs to replace the same with equally

well grown healthy plant.

Planting Ground cover - Planting of ground cover plants in the ground prepared earlier by filling garden soil and manure. Preparing a pit of require size in the ground. Planting the ground cover plant root ball at nine inches apart in the pit after removing carefully and without disturbing the root ball. Pressing the soil firmly around the plant Preparing the basin around the plant watering. Maintenance of ground cover up to two months by regular watering and attending the inter-cultivation practices such as weeding, raking, gap filling, trimming and pruning etc. The ground cover should be well maintained, disease free, well-trimmed at the time of handing over. In case of death of the plant the contractor needs to replace the same with equally well grown healthy plant. Fertilizers /organic solid manures and liquid manures, spray, bio insecticides, parasites, predators required at the time of Plantation and entire period of maintenance as per Maintenance Schedule

Watering Requirements

Tools and Tackles/Hosepipes, tractor mounted Water Tankers or as required to be managed by the Contractor for watering the trees.

d) Handing Over of Shrubs

Date of Handing Over

The Shrubs planting should be done in the selected stretch as released complete /partial scope of work Name Plate for Shrubs The Shrubs planting shall be provided with Name Plate to specify the type of shrubs planted as per the bed and in case of longer beds at appropriate intervals so that the same can be identified at distant observations.

e) Maintenance of Shrubs

After completion of planting works during the subsequent 12(Twelve) month maintenance period the plants should be maintained by regular watering, weeding, replacing dead plants, applying pesticides etc. so as to grow them vigorously.

Trees & plants: should show regular healthy growth through regular maintenance by manuring, fertilizing. Use of plant protection measures, adequate watering etc.

Maintenance of all developed features ground cover, hedges and shrubs etc. of the complex. Maintenance work includes timely pruning, weeding and cutting of ground cover plants, hedges, edges, plants planted in the areas mentioned above. Application of fertilizers, manure, etc. to the lawn, plant and spraying pesticide etc. as and when required.

Seasonal flower beds have to be replaced as and when required (approximately thrice in a year). Plant species can be changed w.r.t. season only in consultation with horticulture

department.

Removal of wild grass normally found growing in rainy season by cutting and/or uprooting so as to keep the areas free of grass.

3.2C SUPPLY OF LAWNS

Plant material shall be well formed and shaped true to type and free from disease, insect and defect such as knots, windburn, sun-cold, injuries, abrasion or disfigurement. Supply and planting of lawn: Planting of lawn grass (Paspalum/ cynadon sp./ zoasia sp./ stenotaphrum etc.) as per drawing without disturbing the desired gradient and level, maintaining (forking, mowing, weeding, fertilizer application) it for a period of 12 Months of completion of virtual completion(No irrigation system provided, however water is available free of cost). Contractor has to make his own arrangement for water distribution)

Specification of Lawns

Supply and Laying of carpet lawn (zoasia sp.) as per drawing without disturbing the desired gradient and level, maintaining (forking, mowing, weeding, fertilizer application) it for a period of 12 Months of virtual completion of development work(No irrigation system provided, however water is available free of cost). Contractor has to make his own arrangement for water distribution)

a) Planting of Lawns Soil Preparation

Top 200 mm depth: The soil shall be essentially good Earth mixed with 1/3rd of decomposed farmyard manure along with additives like Gypsum, sulphur etc. to maintain ph-value of the soil between 7 - 7.5. Planting Dibbling of grass: Fine level the soil, apply thin layer of sand, vermicompost and Neemcake mixture of 1" thickness and dibble the grass at 3" distance. Roll the lawn after planting. Irrigate the lawn regularly. Remove weeds on periodical basis. Nurture the lawn with organic, bio-insecticides, parasites, predators to protect the lawn from pest and disease. Mow the lawn regularly and maintain the grass at 50 mm (2") height. Trim all the edges after moving keep the edges with trees, shrubbery and flower beds clean. The Carpet Grass Primarily Japonica would be brought in Rolled carpet form in healthy condition and shall be placed on the already prepared surface and Light roller should be used for setting of the edges for smooth carpet lawns.

The watering of the lawn should be sufficient for thriving of the lawn to grow then vigorously Fertilizers /organic solid manures and liquid manures, spray bio insecticides, parasites, predators Required at the time of Plantation or as per maintenance schedule Watering Requirements Tools and Tackles/Hose- pipes, tractor mounted Water Tankers or as required to be managed by the Contractor for watering the trees.

b) Handing Over of Lawns

The lawn areas should be considered fit for handing over once the lawns have settled and the surface starts showing the lawn effect.

c) Maintenance of Lawns

For 12 (Twelve) month maintenance period the Lawns should be maintained by regular watering, weeding, replacing dead Spots, applying pesticides etc. so as to grow them vigorously. The Lawn should be regularly mowed and maintained as good green carpet till the final completion of the maintenance period as per the maintenance schedule.

3.3 MAINTENANCE SCHEDULE**3.3A GENERAL OBLIGATIONS**

- a) The Landscape Contractor shall maintain the works for the maintenance period. The Employer reserves the right to terminate the maintenance period at any time, whereby no additional charges are to be made by the Landscape Contractor to the Employer.
- b) The extend of the landscape to be maintained by the Landscape Contractor shall be deemed to cover and include all softscape landscape areas within the overall project boundaries as shown on the drawings including any existing soft landscape not affected by the Sub-Contract works and retained intact or nearly so through the end of the Sub-Contract period as well as all the landscape works covered in the Sub-Contract scope of works. No additional charges will be allowed unless specifically agreed to by the Landscape Architect in writing.
- c) The Landscape Contractor's Horticulturist to inspect the site once every week and if required submit a report to the owner on their actions and closure of the pending works .Also on monthly basis, the Contractor's Horticulturist shall prepare a brief schedule of operations planned for the week with target dates.
- d) The weekly report and the monthly schedule shall be running record of proposed operations which would be checked at the maintenance inspections every month. If in the opinion of the Landscape Architect/Site-In- Charge, the maintenance works have not been satisfactorily carried out according to site conditions and the specifications, the quarterly payment will be withheld until the works have been

satisfactorily carried out besides the penalty as in the penalty clause.

- e) The Landscape Contractor shall take all necessary measures to ensure that all pot plants, trees and shrubs and other plants shall thrive and become established within this period. All landscape areas will be inspected, and list of remedial works issued after each inspection. All items on the remedial lists are to be carried out by the time of the next inspection.
- f) The Landscape Contractor shall always keep the landscape areas clean and tidy and dispose of all waste materials arising from the cleaning.
- g) If the Landscape Contractors works are found to be unsatisfactory, payment shall be withheld, and the maintenance period extended for the period of time that the landscapes maintenance has not been satisfactory. All cost associated with the extension of time shall be borne by the contractor.

3.3 B MAINTENANCE OF PLANTED AREAS: TREES, SHRUBS, CLIMBERS, HERBACEOUS PLANTS AND GROUNDCOVERS

- a) The Landscape Contractor shall water all trees, Delonix regia/Peltaphoram, shrubs, groundcover, herbaceous plants and other planting areas as often as necessary to keep the ground moist all around and to the full depth of the roots.
- b) Only fresh water shall be used for the Works. The Owner shall provide water requirement of the planting materials, but watering shall be all time (Work presence of the Contractor on site) responsibility of the Contractor till the time proper system (Irrigation) is placed by the Owner. Landscape Contractor shall supply all water requirements at his own costs. The Landscape Contractor shall supply his own hoses and sprinklers to distribute the water.
- c) Water shall be applied using an approved rose or sprinkler so as not to cause compaction or washouts of the soil or loosening of plants. The Landscape Contractor shall immediately make good any such damage.
- d) All planting beds are to be kept in a weed free condition with a weeding operation as per maintenance schedule or more regularly as required. All weeds, stones and rubbish collected from this operation shall be removed from the site by the Landscape Contractor.

- e) Firming up and adjusting of stakes/ties shall be carried out monthly to ensure that the trees and shrubs are firmly held in ground. If required, guy ropes or tree ties shall be adjusted, tightened or loosened. If tree ties or ropes are rubbing the bark of the trees, the ties are to be taken off and retied. Any damaged branches are to be carefully pruned and the wounds sealed.
- f) All protective fencing is to be maintained and kept in good condition as long as required on site.
- g) All shrubs and groundcovers are to be reviewed monthly and pruned as per maintenance schedule or as and when required during the Maintenance Period to promote bushy growth and good flowering characteristics. The shrubs shall be checked and all dead wood, broken, damaged or crossed branches shall be cut back, depending on species.
- h) Pruning for all plants shall be carried out as follows:
 - i. Pruning is to be done with the cut just above and sloping away from an outward facing healthy bud.
 - ii. Removal of branches is to be done by cutting flush with the adjoining stem and in such a way that no part of the stem is damaged or torn.
 - iii. Ragged edges of bark are to be trimmed with a sharp knife.
 - iv. Any cuts or wounds over 25mm diameter are to be painted with an approved sealant such as Arbrex after trimming.
 - v. All pruning is to be cleared up and removed from operation site after pruning for Vermi-Composting.
- i) All hedges, mat forming herbaceous plants and groundcover plants shall be clipped with shears as often as necessary (at least monthly) to maintain a tidy appearance. Tall hedges are to be cut to forms shown on the drawings.
- j) Selective pruning of flowering plants shall be done where special flowering characteristics are required such as for Ixoras, Hibiscus, and Bougainvillea etc.
- k) The Landscape Contractor shall on continual basis supervise and attend to fertilizer needs/disease control/termite or fungus control as maintenance operations during the entire period of contract. An approved fertilizer/insecticides/pesticides shall be applied to each plant at the rate provided in the maintenance schedule or as suggested by the Horticulture Advisor to the Owner. Fertilizer shall be applied evenly spread over the entire area and lightly forked into the soils. All areas shall be well watered immediately after application of fertilizer.

- l) The horticultural requirements of different plants or areas may involve variations to those techniques (such as the use of organic liquid fertilizers for sensitive plants) and variations in method will be authorized as required.
- m) Mulching. An additional 25mm deep mulching layer is to be spread over all planted areas (except groundcover and turf), once every 6 months or as specified in Maintenance Schedule.
- n) The Landscape Contractor shall make regular weekly checks to ensure that the plant material is insect and pest and free.

3.3C MAINTENANCE OF LAWN AREAS

- a) The Landscape Contractor shall mow all lawn areas using approved cutting equipment to maintain a close sward to a height of not less than 20mm and not more than 45mm for all grass types. Mowing shall be carried out weekly, except in dry weather and grass shall not be allowed to flower between cuts. All clippings to be gathered up and removed.
- b) All grass areas are to be watered during dry weather as often as is required to keep the grass green and the soil moist. The Landscape Contractor shall make weekly inspections are to be made to determine the need for water.
- c) Fertilizer of NPK value 10-15-15 or similar approved be spread at a rate of 40gm/m² over all grass areas at 6 months intervals using approved spreading equipment to give an overall even spread. Every three months between the NPK application the grass areas will receive and application of 46-0-0 at 1kg/100m². Grass areas that have been fertilized shall be watered immediately. If the tops of the grass turn red a light application of lime using magnesium, limestone or agricultural lime in powder form is to be applied in dry weather at a rate of 50g/m². After application this is to be well watered into the soil.
- d) The Landscape Contractor shall apply top dressing of not more than 15mm depth of fine sand and granulated compost raked and spread evenly over the lawn areas to fill in the low spots and level the grass areas. The next top dressing shall be applied only after the grass has grown to a mow able height.
- e) There shall be at least two applications of top dressing during the maintenance period. If depressions or bumps over 25mm deep or high occur in turf areas during the maintenance period these are to be levelled out by lifting the turf and raising the soil level with sand/compost mix or trimming soil to level grades, followed by returfing.

- f) Grass areas are to be kept free from weeds, annual grasses, fungus and insect attack, and stones or other debris throughout the maintenance period as often as is required. Assessment of these operations is to be prepared on the basis of the bi- weekly maintenance inspection chart.
- g) If compaction or consolidation takes place or hard panning or baking of the soil occurs, the soil areas are to be well watered first and lightly loosened by mechanical means such as spiking, slitting or hollow tinning using equipment approved by the Landscape Architect.

3.4 DETAILS OF PERIODIC MAINTENANCE ACTIVITIES

- a) Sl.No Operation Frequency
(Times) Period/Duration after Handing Over
 - i. Irrigation As per Demand or as specified under
 - a. In Summer 1.5 Month-Every Alternate Day
 - b. In rainy Season 5 to 7 monthly or as per climatic condition
 - c. In winter 10 times Monthly
 - ii. Weeding- 2 times Monthly
 - iii. Forking of the Plants & Shrubs- 2 Monthly
 - iv. Edging- Once Monthly
 - v. Grass Cutting- 2 Monthly
 - vi. Trimming of Shrubs/Ground Covers:
 - vii. Once Monthly or as per instruction of the Site-in-charge.
 - viii. Pruning of Big Trees 2 Yearly
 - ix. Mulching i.e., 50mm thick layer fine powdered FYM or Coco pit /vermin compost
Once in a month.
 - x. Fertilizing
 - Lawn (NPK value 10-15-15)-250 Grm/sq.mt at interval of after planting with enough watering Once Quarterly/Half Yearly as instructed by Site-In-Charge

- Shrubs & Ground Covers etc. @ 50 gram per sq.mt with enough watering Once Quarterly/Half Yearly as instructed by Site-In-Charge
 - Trees @ 50 grams per Tree Once Quarterly/Half yearly as instructed by Site-In-Charge.
- xi. Gypsum+ Sulphur for maintaining pH Value at 7 to 7.5 @ 200 grm/sq.mt or as
- xii. instructed by Site-In-Charge in consultant with Horticulturist or Landscape Consultant Once Yearly.
- xiii. Site Cleaning & maintenance of General Appeal of the Site Daily as & when required but site should be maintained clean.

3.5 DETAILS OF MAINTENANCE STAFF REQUIREMENT

As per the minimum need of the maintenance requirement to the landscape developed area on gross basis as per the maintenance schedule, the following number of the person shall be required for desired activities based on 14140 sqm of landscape area within the 500 Acres campus.

Sl.No Manpower Description Nos:

- a) Trained Gardeners/ labourers - 1 person daily basis
- b) Supervisor / tractor driver / helper - as required for maintenance
- c) Besides, the contractor shall have to deploy a horticulturist as per criteria specified in Clause 3.1, d) and Clause 3.3A, c)

3.6 SOIL TESTING

The Contractor shall be required to get the soil test done as per instruction and supervision of the Site-In- Charge for ensuring the soil correction before the plantation works. The soil test shall be done @ minimum 20 Nos, the location selected randomly by the Site –In- Charge. No extra payment shall be made for test conducted and assumed to be considered in the quoted rates.

Sl.No Parameters Acceptance value

- 1)pH Value 7.5
- 2)Nitrogen Between 25-60 ppm
- 3)Total Soluble Solids 0.01%
- 4)Chloride 20 mg/kg
- 5)Carbonates Between 1 & 60%
- 6)Organic Matter Between 1 & 60%

- 7) Phosphorous Between 4 & 5 ppm
- 8) Calcium Between 150 & 250 ppm
- 9) Magnesium Between 11 & 20% Between 7 and 10 ppm
- 10) Salinity Between 420 & 12 Months 0 ppm
- 11) Sodium Less than 5%
- 12) Potassium Between 90 & 125 ppm
- 13) Sodium Adsorption Ratio (SAR) Between 12% to 15
- % 14) Sulphure as Sulphate Between 7 & 12 ppm
- 15) Iron Between 5 & 20 ppm
- 16) Boron Between 0.5 & 1.0 ppm
- 17) Zinc Between 1.2 & 3.5 ppm
- 18) Copper Between 0.3 & 1.0 ppm

3.7. PLANTING PRACTICES-APPLICATION

a) REQUIREMENT OF SOIL PREPARATION, PLANTING AND MAINTENANCE MATERIALS

i. Soil Conditioner

Soil Conditioner shall be Peat Moss, organic compost composted rice hulls or other approved fibrous organic matter suitable for mixing with topsoil to make a friable growing medium for plants. It shall be resistant to rapid decay, free from soluble salts (below 900ppm), pH 6-7, free from large lumps or debris. Coco-Peat will not be accepted. A sample shall be submitted to and approved by the Landscape Architect prior to installation.

ii. Organic Compost

Organic compost shall be an organic vegetable compost produced through a horticultural or industrial composting process. Compost is to be clean, decomposed, smell free, and free of any debris, refuse, clay or visible fungus. A sample and test data are to be submitted for approval before use. All compost is to be sterilized before being packed for transport. Any odorous materials delivered to site will be rejected. Any vermin resulting from use of organic compost will have to be controlled by the Landscape Contractor within 12 hours.

iii. Peat Moss

Peat Moss shall be fibrous freshwater peat from vegetable fiber. Peat will have a pH of 5.8 – 6.5 and shall be free of soluble salts greater than 900 micromos; Peat shall be

free of lumps, sticks or stones greater than 5mm.

iv. Composted Rice Hulls

Rice hulls shall be partially composted and free from live rice or weed seeds. The rice hull compost shall be nitrogen stabilized and free of particles greater than 5mm.

v. Sand

Sand shall be clean, coarse, well graded material, free from soluble salts. Particles shall range in size so that 80-100% passes the 1mm sieve and 0-50% passes the 250-micron sieve.

vi. Fertilizers

Chemical fertilizers shall be approved granular fertilizers. Fertilizer may be single element or compound, normal or slow release compound fertilizers. They shall be stored in waterproof sealed bags under shelter away from water and direct sunlight. Samples shall be submitted to, and approved by the Landscape Architect, before use in the Works. Organic fertilizers shall be organic products such as organic liquid fertilizer, pellets or granules manufactured primarily from organic materials. These products are to be from accredited sources and technical data indicating sources of origin and manufacturing process must be submitted and approved before use.

Animal by-products must be sterilized before being packed for transport and odorous materials used on site will be rejected.

vii. Mulches

Mulches shall be an approved friable-composted organic material such as Oil Palm husks, organic compost or an approved mix. Coco-peat will not be allowed unless mixed in a proportion of 50-50 with another mulching material free from soluble salts or toxic materials and resistant to rapid decay. Mulches shall have a pH of 5.5 - 7.0. Samples are to submit to the Landscape Architect and approved before use. Mulches are to be applied in a 50mm thick layer over the entire surface of shrub and groundcover areas. Mulching is to be re-applied to expose soil in planting areas every 3 months after initial installation until the end of the maintenance period or until complete surface cover by vegetation is achieved. Initial mulching is to take place within two days of installation of planting.

b) STAKING & SUPPORTS

i. General

Stakes shall always be used when planting instant trees, standards and single stem *Delonix regia*/*Peltaphoram* and for tall shrubs as indicated in the drawings.

Stakes shall be mangrove poles, bamboo or equal and shall be appropriate to the size of the plant to be supported.

ii. Guying

Guying shall be used for large trees or *Delonix regia*/*Peltaphoram*. A minimum of three wire guys are to be used per tree. Each guy wire is to be fastened by a loop around the lowest branches of the tree at the junction with the main trunk or stem. Loops are to have protective rubber or plastic hose to prevent chafing and are to be fastened back to the guy wire by means of U-clamps. Wire shall be 2.5mm PVC coated GI wire, green colour. *Delonix regia*/*Peltaphoram*/equivalent tree shall have 5mm x 3mm x 30mm batons fastened about the trunk with GI wire at the height where the guy wires are to be secured. Guy wires will fasten to the batons and not to the main trunk.

Guy wires are to be fastened at ground level to short stakes firmly driven at an angle into the ground. Stakes shall be 5mm GI coated angle iron or 75mm Mangrove. Stakes shall be a minimum length of 600mm and are to be driven deep enough to resist movement. A notch is to be made near the top of each stake for the fastening of the guy wire. Stakes shall be positioned equally around the tree and shall extend at least 300mm beyond the tree pit. Distance away from the tree shall be gauged on site to provide firm and secure guying. Distance of stakes and final positions shall be finalized on site to provide firm and secure guying.

Each guy wire is to have one turnbuckle located near the fastening to the stake. Guy wires are to be kept properly tension and adjusted to maintain the tree in a vertical position without guy wires being rigid.

iii. Double Staking

Double staking shall be used for standard trees. Two 50mm x 50mm stakes shall be driven into the ground vertically on either side of and outside the root ball of the tree so as to form a straight line with the stem at the centre. Stakes shall be driven in to penetrate the bottom of the tree pit and be deep enough to resist lateral movement when tested. Stakes shall not extend beyond the lowest branch of the tree and if necessary are to be sawn off at the top.

iv. **Fastening or securing** of the tree may be carried out by using either:

- **Cross bar** – a wooden cross bar of same section as the stakes is fastened in a horizontal position to the outside of the stakes by nails or tying securely at a level below the lowest branch. The tree is fastened to the cross bar with a single adjustable tie of an approved rubberized or plastic type with a spacer and shall be fastened to prevent any chafing or abrasion of the bark. Nails or fittings are not to be driven into the tree trunk.
- **Wire/Hose loops** – Two separate wire or rope loops are made about the stem just below the lowest branch with each being fastened back to one of the vertical stakes. Each loop is to have a protective outer covering or sheath of rubber hose to prevent chafing or abrasion of the bark. The wire is to be fastened to the stakes in a manner that allows adjustment of the tension to be made easily. Tension on each wire to be equal to maintain the tree in a vertical position. The wire shall be 2.5mm PVC-coated GI wire, green colour. Where directed by the Landscape Architect the tree may be secured with a second set of loops at a lower level.
- **Single Staking**
Single Staking shall be used for field trees. A single 50mm x 50mm stake is driven vertically into the ground 150mm – 250mm away from the tree. The stake is driven down beyond the base of the tree pit and shall be firm when tested. The top of the stake shall be 100mm below the top of the tree. Ties are to be fastened to avoid rubbing, chafing or abrasion of the bark.
- **“Dead Man” Guying**
“Dead Man” Guying shall be used where directed by Landscape Architect. This method of supporting trees is for use in areas where other conventional methods of support are not feasible. Prior to backfilling two pairs of preservation treated hardwood planks, minimum 100mm x 50mm, are laid across the top of the rootball at right angles so that the trunk or stem is enclosed in a square. The timber planks should be positioned as far out towards the edge of the rootball as possible but kept approximately 100mm in from the edge. Two pairs of galvanized or stainless-steel cables are then led over at right angles to the timber planks and the ends firmly fastened into the ground at the base of the rootball or preferably fastened to a structure nearby. Twin buckles at the mid point of each cable are installed to tighten the cables to a suitable degree. Cables should be tightened only to hold the root-ball firm. Over-tightening may cause the rootball to settle deeper into the ground than desired. Wherever “Dead Man” guying is directed refer to the Sub-Contract drawings for particulars. If Dead Man guying is directed without a drawing the Landscape Contractor is to notify the Landscape Architect.
- **Climber Wires**

Climber wire for training climbing plants against walls shall be approved lightweight PVC coated wire mesh, fixed at 600mm intervals to GI screw eyes. Maximum mesh coverage shall be 12 Months 0mm high x 2400mm wide. The climbing plants shall be trained through the wire mesh with the shoots directed upwards and tied.

c) WATERING OF ALL PLANTS

After planting of all plants are to be thoroughly watered using enough water to soak the ground all around the rootball. After the water has percolated away leaving the surface relatively dry the soil is to be lightly cultivated to give an even soil tilt.

d) MULCHING

After completion of planting, watering and light cultivation operations, a 50mm deep layer of approved mulch shall be spread over all planting areas except turf and groundcover beds. Mulching is to be done within 2 days of completing planting and watering in. The cost of mulching is cleared to be included in the unit rates for planting.

e) FERTILIZING

After planting and before the commencement of maintenance operations all planting areas will be fertilized at three month intervals. Planting beds and pits shall be fertilized with an approved slow release fertilizer at the rate of:

Trees: 250gm per tree

Shrubs/Climbers: 50gm per plant or 50gms/m²

Groundcover: 50gm per square meter

Herbaceous/Rooted shoots: spread around the base of the plants

Turf areas shall receive area 46.0.0 at a rate of 1kg/100m². All fertilized areas are to be watered immediately after fertilizer application

f) DISEASE CONTROL

The Landscape Contractor shall take all necessary precautions to prevent or eradicate any outbreak of disease or insect attack.

g) PLANTING INTO TURF AREAS

Where planting is to be carried out in areas of turf, the turf shall be carefully cut to the size of the tree or shrub pit, rolled and stored for re-use, being kept moist and in shade. After planting, turf shall be re-laid around the base of the plant. The Landscape Contractor shall replace any turf, which is damaged during planting operations. Trees in turf areas shall receive a 15cm high plastic trunk collar to protect the trunk from damage during turf cutting.

h) PROTECTION OF PLANTED AREAS

The Landscape Contractor shall be responsible for protecting all planted areas. If it is necessary for the Landscape Contractor to erect temporary protective fencing, the Landscape Contractor shall be responsible for keeping the fencing in position and in good repair until the end of the maintenance period. Fencing proposals shall be submitted to the Landscape Architect for approval.

i) MAINTENANCE PRIOR TO COMPLETION

- i. After planting and prior to the onset of the maintenance period, the Landscape Contractor shall be responsible for carrying out all necessary measures to ensure that the plant material thrives and becomes established and that the landscape areas are kept in a clean and tidy condition.
- ii. The Landscape Contractor shall allow for carrying out the following maintenance operations when necessary prior to the onset of the maintenance period, all as specified in section 7 of this specification.
 - Replacement of dead/missing plants
 - Grass cutting
 - Watering
 - Cultivation and loosening of soil
 - Weeding
 - Pruning and clipping
 - Firming up and adjustment stakes and ties
 - Eradication of pest or insect attack
 - Top drawing and mulching
 - Fertilizing
- iii. The Landscape Contractor shall be responsible for replacing any plants which fail to survive as a result of inadequate maintenance operations, poor workmanship or poor quality of plant material prior to completion
- iv. The Certificate of completion will not be issued until all plants scheduled on the Drawings and Schedule of Works are installed in a healthy condition in the manner specified.

4.0 OTHER CONDITIONS

4.1 GENERAL HORTICULTURAL & LAND SCAPING SPECIFICATIONS

a) GENERAL

Horticultural operations shall be started on ground previously levelled and dressed to require formation levels and slopes.

In case where unsuitable soil is met with, it shall be either removed or replaced or it shall be covered over to a thickness decided by the Engineer-in-Charge with good earth.

In the course of excavation or trenching during horticultural operations, any walls, foundations, etc., met with shall not be dismantled without pre-measurement and prior to the written permission of the Engineer-in-Charge.

B) MATERIAL

i. Grass

- Cynodon Dactylon-Doob, Calcutta, Rajghat Bermuda
- Improved/hybrid strains of Bermuda grass
- Zoyasia grasses.

The grass shall be fresh, free from weed and rank vegetation but having #Rhizome# with sufficient nodes and shall be approved by Engineer-in-Charge before planting.

- ii. **Farmyard manure** : It shall be well decayed free from grits and any other unwanted materials.
- iii. **Good Earth** : The soil shall be suitable for gardening free from kanker, Moorum, shingle, rocks, stones, brickbats, building rubbish and any other foreign matter. The earth shall be free from clods or lumps of sizes bigger than 75 mm in any direction. It shall have P.H. Value ranging from 6 to 8.5.
- iv. **Oil Cake (Neem/Castor)** : The cake shall be free from husk, dust, grit and any other foreign matter.
- v. **Sludge** : It shall be obtained from approved disposal works.

c) EXECUTION

i. **Trenching** : Trenching shall consist of the following operations :

- The whole plot shall be divided into narrow rectangular strips of about 1.5 m. width or as directed by the Engineer-in-Charge.
- These strips shall be sub-divided lengthwise into about 1 m. long sections. Such sections shall be excavated serially, and excavated soil deposited in the adjacent section preceding it.
- In excavation and depositing care shall be taken that the topsoil with all previous plant growth including roots, get buried in the bottom layers of trenched area, the dead plants so buried incidentally being formed into humus.
- The excavated soil shall be straight away dumped into the adjoining sections so that double handling otherwise involved in dumping the excavated stuff outside and in back filling in the trenches with leads is practically eliminated.

ii. Rough dressing the trenched ground:

Rough dressing the area shall include making kiaries for flooding. The trenched ground shall be levelled and rough dressed and if there are any hollows and depressions resulting from subsidence which cannot be so levelled, these shall be filled properly with earth brought from outside to bring the depressed surface to the level of the adjoining land and to remove discontinuity of slope and then rough dressed again. The supply and spreading of soil in such depressions is payable separately. In rough dressing, the soil at the surface and for 75 mm depth below, shall be broken down to particle to size not more than 10 mm in any direction.

II. Spreading Good Earth

a. Good earth sludge shall be removed from stacks by head load and spread evenly over the surface to the thickness ordered by the Engineer-in-Charge. It shall be spread with a twisting motion to avoid segregation and to ensure that spreading is uniform over the entire area.

III. Uprooting Weeds from Trenched Areas

a. After 10 days and within 15 days of flooding the rough dressed trenched ground with water, the weeds appearing on the ground, shall be rooted out carefully and the rubbish disposed off as directed

by the Engineer-in-Charge.

IV. Fine Dressing the Ground

a. Slight unevenness, ups and downs and shallow depressions resulting from the settlement of the flooded ground, in drying and from the subsequent weeding operations, shall be removed by fine dressing the surface to the formation levels of the adjoining land as directed by the Engineer-in-Charge, and by adding suitable quantities of good earth, brought from outside, if necessary. Such supply and spreading of good earth stacked at site is, however, payable separately. In fine dressing, the soil at the surface and for 40 mm depth below shall be broken down to particles of size not exceeding 6 mm in any direction.

V. Mixing of Good Earth and Sludge / Manure

a. The stacked earth shall, before mixing, be broken down to particles of sizes not exceeding 6 mm in any direction. Good earth shall be thoroughly mixed with sludge or manure in specified proportion as described in the item or as directed by the Engineer-in-Charge. The mixing shall be spread as described in 18.5.1 to the thickness ordered by the Engineer-in-Charge.

VI. GRASSING WITH 'DOOB GRASS'

vii. The area from where the grass roots are to be obtained shall be specified by the Engineer-in-Charge at the time of execution of the work and no royalty shall be charged on account from the contractor. The soil shall be suitably moistened and then the operation of planting grass shall be commenced. The grass shall be dibbled at 10 cm, 7.5 cm., 5cm., apart in any direction or other spacing as described in the item. Dead grass and weeds shall not be planted. The contractor shall be responsible for watering and maintenance of levels and the lawn for 30 days or till the grass forms a thick lawn free from weeds and fit for moving whichever is later. Generally planting in either direction at 15 cm., 10 cm, spacing is done in the case of large open spaces, at 7.5 cm. spacing in residential lawns and at 5 cm, spacing for Tennis Courts and sports ground lawns.

d) PRECAUTIONS :

During the maintenance period, any irregularities arising in ground levels due to watering or due to trampling by labour, or due to cattle straying thereon, shall be constantly made upto the proper levels with earth as available or brought from outside as necessary. Constant watch shall be maintained to ensure that dead patches are replanted, and weeds are removed.

e) MEASUREMENT

Length, breadth and depth shall be measured correct to a cm., where unit of measurement is cum and the volume shall be calculated in cum correct to two places of decimal.

Length and breadth shall be measured correct to a cm., where unit of measurement is sqm and the area shall be calculated in sqm correct to two places of decimal.

Length shall be measured correct to a cm., where unit of measurement is meter. The items shall be enumerated, where the unit of measurement each.

For the items of supply of material, the stacks measurement shall be taken for length breadth and depth correct to a cm. The volume of stacks shall be reduced for voids, as given below, to arrive at the net quantity for payment:

FARMYARD MANURE	8%
GOOD EARTH	20%
SLUDGE	8%

