

PART-II

TECHNICAL SPECIFICATIONS

- **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 of for landscape works only after sign-off by the Site-In-Charge on joint inspection with the Landscape Contractor.
 - **SOIL PREPARATION:** Rough grading and earthworks per section 2 of the specification. This work shall include the supply, placement, shaping of earth berms, 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, berms 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 form the landscape bill as raised by the contractor on plantation works. Also the contractor shall be required to create landforms (mounds & berms) 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 on the basis of the total volume of the earthworks payable in [cu.mt.](#)
-
- **PLANTATION WORKS:** The landscape contractor shall be required to complete the plantation works as per the planting schedule provided in —Section-5 of Special Conditions of the Contract.
 - **MAINTENANCE WORKS:** The contractor shall be responsible for maintenance of the plantations works for 12 months.
 - All the Contract Works shall be executed in full compliance with all requirements and always to the satisfaction of the Employer.
 - he Contractor shall be deemed to have inspected, tested and examined the site and surroundings and to have satisfied himself as to all the conditions, factors and risks which can be reasonably obtained or inferred from the inspections, tests and examinations that may influence or affect the progress and cost of Contract Works.
 - The Contractor acknowledge that he understands the Special Economic Zone (SEZ) rules and regulation as per SEZ Act 2005 and he further acknowledge that he will abide all the rules and regulations of SEZ Act, laws related to custom duties, notified area and all other related things affecting the Contract works directly or indirectly and shall not make any claim in any account whatsoever related to SEZ acts, rules and regulations.
 - The Contractor shall resolve local constraints and problems, liaise, seek, and obtain any consent,

permit, license, approval, etc. from all Relevant Authorities including paying all fees, charges, levies, etc all at his own cost.

- Clearing all debris and disposing to location approved by Relevant Authorities during progress of Contract works and before and after the dates of Completion.
- All temporary works, haul/access roads that are necessary for the proper and due completion of the Contract Works.

GENERAL -TERMS OF REFERENCE FOR WORK EXECUTION

	Terms of Reference	Description
a)	Design & Details	Contractor has to work as per the designs and lineout details provided by Landscape Consultant. Difficulty on site in execution as per the plan/design has to 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 Top Soil (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 8-10 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)	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 installment..
		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

(f)	Reports	The Contractor shall submit daily 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 daily report along with evidence in form of photographs. Also the contractor shall be required to maintain Stock Register at all times for the planting material sourced to Owner's site and Supply for plantation in the Nursery maintained by the Contractor.
	Nursery Maintenance Office Set-up	The Contractor shall be required to set-up Office for its staff and 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.
(g)	Vermi-Composts	Contractor shall mandatorily 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 require 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.
(h)	Payment Schedule	<p>The Payment shall be processed on the basis of SLA on monthly basis during this contract period.</p> <p>Payment Terms based on the item rates for the quantum of the certified virtual completion of the work shall be as follows</p> <p>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.</p>

2. PLANTING SCHEDULE

I. Tree Plantations during Mortality		
Sl.No	Terms of Reference	Instruction & Procedures
A. Supply of Trees		
1	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
2	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.
3	Specification of Trees	<p>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.</p> <p>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-in-charge in special case after due confirmation of the landscape consultant.</p> <p>3. 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.</p>
B. Planting of Trees		
1	Pit Size	Minimum Pit Size for all trees should be of the size 1mtX1mtX1.2mt In case of larger trees pit size should be of 1mtX1mtX1.2mt
2	Soil Preparation- Preparation of tree pits:	The soil shall be essentially good Earth mixed with 1/3 rd of decomposed farmyard manure along with additives like Gypsum, sulphur ,Zinc Sulphide (ZnS)etc to maintain ph-value of the soil between 7 - 7.5

3	Planting of trees	<p>a) 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.</p> <p>b) 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 need to replace the same with equally well grown healthy plant.</p>
4	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.

5	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
6	Watering Arrangement	Making basin around Trees (1mtr dia clear space) and maintaining Tools and Tackles/Hose-pipes, tractor mounted Water Tankers or as required in sense all arrangement for water distribution and watering equipments/manpower to be managed by the Contractor for watering the trees;
Handing Over of Trees		
1	Name Plate for Trees	All Tees 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
Maintenance of Trees		
1	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

1) Watering of plantation area as per Site requirement and physical inspection.

2) Applying FYM as per Site requirement and physical inspection. Trimming, pruning as & when required under guidance of the site-in-charge etc.

4) 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

I. Shrubs Plantations against Mortality		
Sl.No	Terms of Reference	Description
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.
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	<p>a) 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.</p> <p>b) 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 farm yard manure or vermicompost. Treat the soil with chlorophyriphos / 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.</p> <p>c) Preparation of pits for shrubs, creepers and hedges : The bed</p>

	Planting	a) 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
--	----------	---

		<p>b) 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 need 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</p>
		<p>c) 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 need to replace the same with equally well grown healthy plant.</p> <p>d) 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 month 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</p>
	<p>Fertilizers /organic solid manures and liquid manures, spray bioinsecticides, parasites, predators</p>	<p>Required at the time of Plantation and entire period of maintenance as per Maintenance Schedule</p>

	Watering Requirements	Tools and Tackles/Hose-pipes, tractor mounted Water Tankers or as required to be managed by the Contractor for watering the trees;
C. 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
M	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
D Maintenance of Shrubs		
		1. 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.
		2. 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.
		3. Removal of wild grass normally found growing in rainy season by cutting and/or uprooting so as to keep the areas free of grass.
Plantation of Lawns against Mortality		
		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, fertizer 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)
Planting of Lawns		
	Soil Preparation	Top 200 mm depth: The soil shall be essentially good Earth mixed with 1/3 rd of decomposed farmyard manure along with additives like Gypsum, sulphur etc to maintain ph-value of the soil between 7 - 7.5

	Planting	<p>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 mowing; keep the edges with trees, shrubbery and flower beds clean.</p> <p>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 adges for smooth carpet lawns. The watering of the lawn should be sufficient for thriving of the lawn to grow then vigorously</p>
	Fertilizers /organic solid manures and liquid manures, spray bio-insecticides,	Required at the time of Plantation or as per maintenance schedule

MAINTENANCE

GENERAL OBLIGATIONS

- 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.

- 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.

- The Landscape Contractor's Horticulturist shall inspect the site every day and shall submit report to the owner on their actions and closure of the pending works. Also on weekly basis, the Contractor's Horticulturist shall prepare a brief schedule of operations planned for the week with target dates.

- The daily report and the weekly 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.

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.**

- The Landscape Contractor shall keep the landscape areas clean and tidy at all times and dispose of all waste materials arising from the cleaning.

- **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.**

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

- The Landscape Contractor shall water all trees, palms, 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.
- 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. Water shall be applied using an approved rose or sprinkler so as not to cause compaction All shrubs and groundcovers are to be reviewed monthly and

uned 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.

• **Pruning for all plants shall be carried out as follows :**

- Pruning is to be done with the cut just above and sloping away from an outward facing healthy bud.
- 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.
- Ragged edges of bark are to be trimmed with a sharp knife.
- Any cuts or wounds over 25mm diameter are to be painted with an approved sealant such as Arbrex after trimming.
- All pruning are to be cleared up and removed from operation site after pruning for Vermi-Composting.

- 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.
- **Selective pruning of flowering plants shall be done where special flowering characteristics are required such as for Ixoras, Hibiscus, Bougainvillea etc.**

- 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. **shall apply the fertilizer evenly spread over the entire area and lightly forked into the soils. All areas shall be well watered immediately after application of fertilizer.**

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.

Mulching. An additional 25m 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.

DETAILS OF PERIODIC MAINTENANCE ACTIVITIES

Sl.No	Operation	Frequenc v(Times)	Period/Duration after Handing
1	Irrigation		As per Demand or as specified under
(a)	In Summer	15	Month-Every Alternate Day
(b)	In rainy Season	5 to 7	Monthly or as per climatic condition
(c)	In winter	10	Monthly
2	Weeding-	2	Monthly
3	Forking of the Plants & Shrubs-	2	Monthly
4	Edging-	Once	Monthly
5	Grass Cutting-	2	Monthly
6	Trimming of Shrubs/Ground	Once	Monthly or as per instruction of the site-in-charge
7	Pruning of Big Trees	2	Yearly
8	Mulching i.e., 50mm thick layer fine powdered FYM or Cocopit /vermin-compost	Once	Once in a month
9	Fertilizing		
(a)	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
(b)	Shrubs & Ground Covers etc @ 50 gm per sq.mt with enough watering	Once	Quarterly/Half Yearly as
(c)	Trees @ 50 grams per Tree	Once	Quarterly/Half Yearly as
10	Gypsum+ Sulphur for maintaining pH Value at 7 to 7.5 @ 200 or as instructed by Site-In-Charge in consultant with Horticulturist or Landscape Consultant	Once	Yearly
11	Site Cleaning & maintenance of General Appeal of the Site	Daily	As & When required but site should be maintained clean

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 as per satisfaction of employer

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 5 Nos, the location selected randomly by the Site –In-Charge.

Sl.No	Parameters	Acceptance value
**	pH Value	7.5
**	Nitrogen	Between 25-60 ppm
S,	Total Soluble Solids	0.01%
**	Chloride	20 mg/kg
**	Carbonates	Between 1 & 60%
s*	Organic Matter	Between 1 & 60%
**	Phosphorous	Between 4 & 5 ppm
8)	Calcium	Between 150 & 250 ppm
	Magnesium	Between 11 & 20% Between 7 and 10
10)	Salinity	Between 420 & 12 Months0 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 & 1.0ppm
¹⁷⁾	Zinc	Between 1.2 & 3.5 ppm
,M	Copper	Between 0.3 & 1.0ppm

REQUIREMENT OF SOIL PREPARATION, PLANTING AND MAINTENANCE MATERIALS AGAINST MORTALITY

1. 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.

2. Organic Compost

Organic compost shall be an organic vegetable compost produced thorough 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 is 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.

3. Peat Moss

Peat Moss shall be fibrous fresh water peat from vegetable fibre. 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.

4. 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.

5. 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.

6. 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.

7. 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 be submitted 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.

STAKING & SUPPORTS

1. General

- i. **Stakes shall always be used when planting instant trees, standards and single stem palms and for tall shrubs as indicated in the drawings.**
- ii. **Stakes shall be mangrove poles, bamboo or equal and shall be appropriate to the size of the plant to be supported**

2. Double Staking

- i. 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 rootball of the tree so as to form a straight line with the stem at the center. 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.
- ii. Fastening or securing of the tree may be carried out by using either :
 - a) **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.**
 - b) **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.

iii. Where directed by the Landscape Architect the tree may be secured with a second set of loops at a lower level.

3. 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.

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 tilth.

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.

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/m ²
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.

DISEASE CONTROL

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

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 relaid 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.

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.

MAINTENANCE

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.

- i. 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 is installed in a healthy condition in the manner specified.

The Contractor accepts that in the event of supply of any material from Employers side

pursuant to (Supply Of Material). The Item rate quoted by the Contractor shall be re-calculated and the Contractor will not make any claim whatsoever in account of material part of the rates (including all profits, overheads, taxes etc. all) quoted by him in the Bills Of Quantity.