



LANDSCAPE DBR

VOL -III

**CONSTRUCTION OF PROPOSED CENTRE OF
EXCELLENCE OF FIRE TESTING TRAINING AND
RESEARCH LABORATORY AT IIT, PATNA**

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1. OBJECTIVE

This section describes the landscaping elements used in defining outdoor spaces for arrival garden, banquet lawn, drop-off/entry plaza, pedestrian/ vehicular circulation and recreation. The landscaping design demonstrates principles of site planning and functionality to provide users, guests and visitors outdoor spaces for various activities, with landscaping elements that enhance the context within which they are placed.

Proposed landscape design focuses on landscape interventions which facilitate the activities associated with the project and enhance the overall site based on environmentally sensitive design taking into consideration site planning, storm water management, existing and proposed vegetation. Interventions such as paving material, seating, furniture and planting palette are basic components.

Note – Design of Landscape should be as per the design standard mentioned in NBC part 2-clause no -5.2. All prepared drawings to be evaluated and needs to get approved from BCD before execution of work. Landscape specification may change as per the direction and requirement given by the BCD.

2. LANDSCAPE WORKS

Special precautions shall be taken by the Contractor to avoid damage to existing sewerage pipes, storm water drains, and pipes, storm water grids, and inlets, manholes, valve casings, water pipes and taps, fire hydrants, irrigation pipes and equipment, electrical cables, completed landscaping works, telephone and light poles, vegetation and other services.

2.1. Protection of Existing Property

- a) The Contractor shall take all necessary precautions against damage that might occur to any person, animal, building, structure, services, vegetation, vehicles etc.
- b) Enough warning signs, railings, lighting etc. shall be placed around excavations, obstacles, and heaps.
- c) Foot bridges, shall be placed over trenches, where necessary for the convenience of the public.
- d) Construction activity is to be limited to pre-designated areas and with the prior approval of the client's representative.

2.2. Guidelines for Trees to be removed

Any existing trees identified as “to be removed” or any dead trees:

- a. Contractor shall engage a suitably experienced arborist to undertake any tree works. Trees should be for removal or cut and fell, as close to the ground as possible;
- b. Trunks to be cut to convenient lengths for removal or integration with the landscape works;
- c. Root stumps to be removed to a minimum depth of 800mm below ground level, with lateral branches over 100mm in diameter removed from the site;
- d. Any debris or material that comes from the above works shall be utilized in accordance with Waste Management Plan.

2.3. Guidelines for Trees to be retained

- a. All retained trees should be clearly identified “TO BE RETAINED” and information signs should be displayed on site in prominent positions at each entrance and noted on the Site Protection plan
- b. All retained trees shall be marked by visible, durable tags, lettered to tree number or symbol (if any) on the drawings and these numbers should be clearly identified on the Site Protection Plan prepared by the Contractor
- c. Trees should be fenced off the works area if possible, in all cases tree trunk and roots should be protected from site works;
- d. Protected area should be in a shape of a circle around each tree to the extent of the canopy drip line or to a radius of 3m, measured from tree trunk for trees under 5 mts in height.
- e. Do not store any materials or allow site equipment or vehicles to pass under or near the trees to avoid soil compaction Prevent damage to tree bark; do not attach any items to trees.
- f. Do not add or remove topsoil within the drip line of trees; do not fill against tree trunks even temporarily;
- g. Open excavation under tree canopy should be carried for as short period as possible. If exposing roots unnecessarily, temporarily line excavation with polyethylene sheet to reduce evaporation;
- h. Use only hand methods to locate, expose, and cleanly remove the soil around roots on the line of excavation. Root systems should be preserved intact.

- i. When it is necessary to cut the roots bigger than 25mm diameter, make sure the cutting does not disturb remaining root system. Cut should be smooth with no ragged edges. Clean cut surface should be immediately treated with bituminous fungicidal sealant.

2.4. The site-wide execution works within the site include the following:

a. Site Investigation:

1. Site investigation shall provide data to proceed with works.
2. Obtaining all the information on the nature of the site and sub-surface soil conditions for the purpose of preparing an in-depth response and the subsequent execution.
3. Establish records of mean water table; identify all previous known uses of the site; Identify site features to be preserved; identify areas of limited access, incomplete work by others or any other issues which may hamper the execution of the works
4. Demolition works

b. Landscape Zones/ Features:

1. Pathways driveways and parking areas
2. Universally accessible areas
3. Entrance plaza/ gateway/drop-off plaza
4. Shade structures

c. Site Furniture:

1. Benches
2. Mild steel Pergola
3. Rubbish receptacles/Dust Bins
4. Signage – Entry, Directional, Place Identification

d. Earthworks: Excavation and filling

Ground works general, protection of existing trees, site clearance, excavation, placing, ground shaping, grading and compacting earth fill, installation of geotextile and earth reinforcement

1. Excavation and filling to achieve levels and site grading.
2. Excavation and filling works for site drainage.

3. Excavation and filling works for pathways and foundations
4. Excavation and filling for installation of utilities.
5. Dewatering and drainage works

e. Hardscape – Materials: Paving, Coping, Cladding edging in pathways, planters, walls, ramps, steps, etc. including sub-base, leveling and all allied works. All hardscape materials to be of required strength size and approved surface finish.

1. Granite Cobble Stone (of approved compressive strength) for driveway.
2. Granite Grey (Flamed/ Sandblasted/Polished), Granite Black paving stone
3. Granite Stepping stones, Flamed
4. Exposed aggregate concrete finish,
8. Concrete kerb (various sizes)
9. Granite solid stone seat/benches

f. Site Utilities:

1. Post Top Lighting for driveways and pathways and lawns
2. Wall mounted area light
3. Stone Bollard lighting for garden

The lux level at the exterior areas of the building, i.e. car parking and adjoining areas is to be maintained at a minimum of 50 lux. External Lighting is to be designed to take care of both landscape and Security. Fixtures shall be such as low maintenance, low loss, higher lamp life, aesthetically complementary to the surroundings.

g. Wall:

The general requirements for brick and stone masonry for external wall surfaces, also all allied works including all materials, labor, curing, scaffolding, tools etc.

1. Cement rendered masonry wall for Ramps/Steps with stone cladding and coping.
2. Planter walls with stone cladding and coping.

Access:

1. Gradual ramps for all ability movement

2. Steps

h. Soft-scape:

All planting and grassing works associated or implied within the landscape and podium.

Nursery grown, true to species, variety, cultivar, stem form and other features required in the Plants list/schedule. - Free from injury. - Self-supporting. - With caliper at any given point on the stem greater than the caliper at any higher point on the stem, fully branched, foliage size, texture and color consistent with that of healthy specimens for the nominated species.

1. Planter beds
2. Shading trees, Hardy trees, Ornamental trees, Palm trees
3. Shrubs and Groundcover
4. Banquet lawn area
5. Transplanting trees

i. Surface Treatments

All paints and coating on floors, walls, landscape structures and all allied works.

1. Textured Paint to various wall surfaces:
2. Granite/stone/tile cladding.

j. Drainage

1. Permeable surfaces (Grass)
2. Rainwater harvesting pits, trenches, swales and French drains.
3. Surface water drainage at ground level
4. Sub Surface water drainage for podium level
5. Installation of pipes, catch-basins, drains boards, slot drain systems, channel drains, perforated pipes, geo-textile etc. and all allied works.

k. Irrigation

An automatic or semi-automatic system for irrigating all softscape and lawns should be installed adopting best practices of water conservation and usage.

l. Waterproofing works

Provision of appropriate waterproofing base in concrete and masonry works for planters, water features, structural slabs and walls etc.

m. Operation and maintenance:

All systems need to be maintained and operated as per guidelines laid down in operation and maintenance manual for water features, green wall, and softscape etc.

The whole installation of the system to be aesthetically and operationally compatible with the intent of design and extra/special care to be taken to meet the objectives.

3. 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

a) Grass

1) Cynodon Dactylon-Doob, Calcutta, Rajghat Bermuda

2) Improved/hybrid strains of Bermuda grass

3) 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.

b) Farm yard manure: It shall be well decayed free from grits and any other unwanted materials.

c) Good Earth: The soil shall be suitable for gardening free from kanker, Moorum, shingle, rocks, stones, brick-bats, 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.

d) Oil Cake (Neem/Castor): The cake shall be free from husk, dust, grit and any other foreign matter.

e) Sludge: It shall be obtained from approved disposal works.

C. EXECUTION

a) Trenching: Trenching shall consist of the following operations:

1) The whole plot shall be divided into narrow rectangular strips of about 1.5 m. width or as directed by the Engineer-in-Charge.

2) 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.

3) In excavation and depositing care shall be taken that the top soil 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.

4) 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.

b) 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.

c) SPREADING GOOD EARTH

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.

d) UPROOTING WEEDS FROM TRENCHED AREAS

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 of as directed by the Engineer-in-Charge.

e) FINE DRESSING THE GROUND

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.

f) MIXING OF GOOD EARTH AND SLUDGE / MANURE

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.

g) GRASSING WITH 'DOOB GRASS'

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 up to 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%

4. MAINTENANCE SCHEDULE

4.1. 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 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.
- d. 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.
- 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 keep the landscape areas clean and tidy at all times 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.

4.2 MAINTENANCE OF PLANTED AREAS: TREES, SHRUBS, CLIMBERS, HERBACEOUS PLANTS AND GROUND COVERS

- a. 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.
- 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 wash-outs 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:

- 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.
- 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 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.
- 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.

4.3 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 applications 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.

5. LANDSCAPE DESIGN INTENT

The landscape has been designed to aesthetically augment the architectural spaces with complementary functions. The landscape spaces can be divided into three major components or parts.

The design should cater to and facilitate the day to day activities to be conducted in the campus. Appropriate street design needs to be followed with shaded pathways for user experience and to improve the microclimate of the site. Pathways and safe bicycle movement should be facilitated on the campus.

Landscape plazas and design for entrance gates and entrance areas of buildings should be focused upon to create identity and orientation for the user and visitors.

Design of hardscape areas should be robust and low maintenance.

Softscape design should respond to the intended importance and use of the space and plant selection should be done appropriately to highlight the space. Areas around important buildings can be high maintenance with more manicured plant design while boundary areas, inaccessible low usability spaces and incidental spaces can be low irrigation low maintenance with more of native hardy plants.





6. LANDSCAPE SPECIFICATION





Sl.No.	Description Of Work	Unit
1.00	Cutting , clearing thin jungle including vegetation and grass and removal of roots with an initial lead of 50m and lift of 1.5 meters	sq.m.
2.00	Trenching in ordinary soil upto a depth of 60cm including removal and stacking of serviceable materials and then disposing of by spreading and neatly levelling with in a lead of 50m and making up the trenched area to proper levels by filling with earth or earth mixed with sludge or/and manure before and after flooding trench with water (excluding cost of imported earth, sludge or manure).	cu.m.
3.00	Supplying and stacking of good earth at site including royalty, loading, unloading and carriage upto 10 km (earth measured in stacks will be Reduced by 20% for payment).	cu.m.






4.00	Supplying and stacking sludge at site including royalty, loading, unloading and carriage upto 10 km (sludge measured in stacks will be reduced by 8% for payment).	cu.m.
5.00	Supplying and stacking at site well decayed cow dung manure from approved source, including loading, unloading and carriage upto 10 km (manure measured in stacks will be reduced by 8% for payment) :	cu.m.
6.00	Rough dressing the trenched ground including breaking clods.	sq.m
7.00	Uprooting weeds from the trenched area after 10 to 15 days of its flooding with water including disposal of uprooted vegetation.	sq.m.
8.00	Fine dressing the ground	sq.m.
9.00	Spreading of sludge, dump manure or/and good earth in required thickness (Cost of sludge, dump manure or/ and good earth to be paid separately).	cu.m.
10.00	Mixing earth and sludge or manure in proportion specified or directed	cu.m
11.00	Grassing with 'Doob' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for mowing including supplying good earth if needed (the good earth shall be paid for separately).	
	Grass variety --quote /smt	
11.01	Calcatta doob	sq.m.
11.02	Shade grass.	sq.m.
11.03	Carpet grass	sqm

12.00	Renovating lawns including weeding, cheeling the grass, forking the ground, top dressing with sludge or manure, mixing the same with forked soil, watering and maintaining the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for mowing and disposal of rubbish as directed, including supplying good earth if needed but excluding the cost of sludge or manure (the good earth shall be paid for separately) alongwith 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.	sq.m.
13.00	Preparation of beds for hedging and shrubbery by excavating 60cm deep and trenching the excavated base to a further depth of 30cm, refilling the excavated earth after breaking clods and mixing with sludge or manure in the ratio of 8:1 (8 parts of stacked volume of earth after reduction by 20% : one part of stacked volume of sludge or manure after reduction by 8%), flooding with water, filling with earth if necessary, watering and finally fine dressing, levelling etc. including stacking and disposal of materials declared unserviceable and surplus earth by spreading and levelling as directed, within a lead of 50m lift upto 1.5 m complete (cost of sludge, manure or extra earth to be paid for separately).	sq.m.
	Shrub planting works	
14.00	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any with all leads and lifts (cost of manure, sludge or extra good earth if needed to be paid for separately) :	
14.01	Holes 0.75 m x 0.75x 0.75 for Trees	each






14.02	Holes 0.60 x0.60 x 0.60 for Shrubs	each
14.03	Holes 0.45 x0.45 x 0.45 for small Shrubs	each
15.00	Filling mixture of earth and sludge or manure in the desired proportion in trenches, flooding with water and levelling (cost of supplying earth and sludge or manure and mixing excluded).	cu.m.
16.00	Providing and planting following herbs in garden including preparation of soil, base plantation, providing and spreading different fertilizers, soil and sand:for Plant list refer the table below (including the following Maintenance Schedule)	
	<p>Maintenance of shrubs,plants, groundcover (Item No. to Item no.)After completion of 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.</p> <p>b) Trees & plants: should show regular healthy growth through regular maintenance by manuring, fertilizing. Use of plant protection measures, adequate watering etc.</p> <p>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.</p> <p>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.</p> <p>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.</p>	



16.01	Acaalypha		each
16.02	Aphelandra		each
16.03	Eranthemum		each
16.04	Crotons		each
	Shade plants-----2' height species		

16.13	Cordyline snow bush		each
16.16	Philodendron		each
16.17	Syngonium		each
16.19	Schefflera		each
	Supplying of Ornamantal		

17.01	Lawsonia		each
17.02	Coleus		each
17.03	Duranta variety		each
17.04	Acalypha variety		each
17.05	Ophiopogon		each

18.00	Planting of Trees and their Maintenance for one Year (Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year)	each
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	Specimen Trees --- 7ft Height, 2”girth		
18.01	Plumeria alba Glyricidia		each
18.02	Lagerstroemia		each
18.03	Tabebuia Rosea		each
18.04	Bottle brush		each
18.05	Cassia fistula		each

18.06	Gulmohar		each
18.07	Jacaranda		each
19.00	ANNUAL TREE MAINTENANCE SCHEDULE		
19.01	ANNUAL TREE MAINTENANCE SCHEDULE 1) Watering every alternate days @ 20 litres/watering cycle 2) Applying FYM @ 10kg/ tree/ annum 3) 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 4) Trimming, pruning as & when required under guidance of the site-in-charge etc.(NEW PLANTED)		each
19.02	ANNUAL TREE MAINTENANCE SCHEDULE 1) Watering every alternate days @ 20 litres/watering cycle 2) Applying FYM @ 10kg/ tree/ annum 3) 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 4) Trimming, pruning as & when required under guidance of the site-in-charge etc.(EXISTING)		each

7. GREEN BUILDING RATINGS

As the building is to be constructed as per GRIHA norms and intended for minimum 3 Star rating, the Contractor has to comply all the specific requirement at their own cost such as barricading the site at required height, covering the construction material, sedimentation tank, conserve the top soil, arrangement of wheel wash for all inward and outward vehicle, segregation of all scrap material, disposal of hazardous extract generated during construction at appropriate place etc.

The contractor shall appoint a suitable green building Department for preparation and submitting required energy simulations, documentations and other requirements to GRIHA for getting minimum 3-star rating. The Contractor should extend their all-out support to the GRIHA Team as and where required for achieving the desired GRIHA rating.