**Technical specifications for preservation of mature trees designated for preservation in the Turkish railway plan – Eliphelet Station – Tel-Aviv Yaffo**

**1 – Instructions for tree preservation**

* A total of 43 trees were designated for preservation. All details and characteristics of these trees are presented in the table in the tree appendix.
* All the trees designated for preservation should be preserved in their current location. Felling or transplanting of these trees is absolutely prohibited.
* To prevent damage to the trees’ surroundings, a fence should be erected around each tree, serving as protection during the period of roadworks. The fence should be erected at a distance of 2 m from the tree trunk. A “tree for preservation” sign should be attached to the fence in a prominent position (see example in the photographs).
* To prevent damage to roots, excavation works should not be conducted within a radius of 4 m from the tree trunk.
* In the event of damage to roots (cutting), an experienced arborist authorized by the Ministry of Agriculture should be employed to treat the damaged roots. The arborist will make a clean cut, rub the root with tree paste, and wrap the exposed roots with a geotextile fabric—a necessary measure to prevent dehydration until the root is covered with soil. During the treatment, the root surroundings should be kept moist by indirect spraying with water.

**Technical specifications for transplanting trees designated for transplanting in the Turkish railway plan – Eliphelet Station – Tel-Aviv Yaffo**

**1 – General**

* 2 trees were designated for transplanting: 2 individuals of common oak (*Quercus calliprinos*), 1 terebinth (*Pistacia palaestina*)*,* 1 olive tree (*Olea europaea*) and 1 Mediterranean medlar (*Crataegus azarolus*). The characteristics of these trees are presented in the table in the tree appendix.
* The planting site for the transplanted trees will be defined before commencing the transplanting process, in coordination with the plan’s landscape architect.
* The purpose of the actions described below is to enable the trees to continue functioning after they have been moved to their new location.
* All transplanting activities will be performed by a professional arborist, officially authorized by the Ministry of Agriculture to transplant trees.
* A supervisor, who is not connected professionally to the arborist, will accompany all stages of the tree transplanting process. The project manager is responsible for appointing the supervisor for the transplanting work. The supervisor will be authorized by the Ministry of Agriculture to supervise tree transplanting.

**2 – Preparing trees for transplanting**

* Since we are dealing with two evergreen trees, the most appropriate time for transplanting is March-April. If this is not possible, the trees may be transplanted during May, but no later.
* A U-shaped trench should be excavated to a depth of 40 cm around the tree, at a distance of 2.5 m from the tree. If a root is cut during excavation, a clean cut should be made (rather than tearing it off with an excavator).
* Each tree should be irrigated 3 times, once every 10 days: the first irrigation with 3 m3 water and two additional irrigations of 1.5 m3 each.

**3 – Method for pruning prior to transplanting**

* The tree’s skeleton should be retained to at least the second level of branching. The main stem should not be damaged. The primary branches should not be pruned and at least 50% of the canopy should be retained. In any case, the original canopy of the tree should not be reduced by more than 2/3. The circumference of pruned branches should not exceed 8 cm. Pruned branches with circumference greater than 4 cm should be treated with tree paste (see above).
* A branch should be chosen for tying for the purpose of detaching and raising the tree and soil ball.
* Basic sanitation procedures should be administered: removal of dead branches, removal of projections, clean cuts on pruned branches.
* If the supervisor sees fit, the trunk and primary branch bases may be sprayed with whitewash to prevent sun scald. However this is not necessary if the transplanting takes place as required during March-April.

**4 – Preparing the root ball for removal**

* The circumference of the root ball should be 2.5 m, i.e. 2.5 m from the trunk to the edge of the soil ball, containing the roots, which will be transplanted.
* The root ball should have a minimum depth of 75 cm.
* During excavation around the tree, exposed roots should be cut with a sharp tool (chain saw), and should not be torn with an excavator or a shovel. It is very important to make clean cuts on the roots as well.
* After cutting the roots, there should be a mandatory waiting period of 30 days to enable development of as many feeder roots as possible within the transplanted soil ball. During this period the entire soil ball, including the roots, should be maintained moist, but not saturated, by spraying it with water. The amount of water and frequency of wetting will be determined by the supervisor according to the field conditions and the meteorological conditions during the period of preparation for transplanting.
* After this period, excavation of the soil ball should be completed using an excavator with a shovel bucket. The circumference of the soil ball must not be reduced during excavation. The shape of the soil ball should reflect the distribution of the roots as revealed during excavation, such that a volume of soil with a high concentration of roots will be retained even if it is at a distance greater than the defined dimensions of the soil ball.

**5 – Detaching the root ball from the soil and transportation to new site**

* The root ball should be detached gradually by excavation below the soil ball until it is completely disconnected from the underlying soil. To complete detachment, the ball can be gently nudged using an excavator. If the supervisor deems necessary, a crane may be used as long as the branches can be tied without damaging the tree.
* Care must be taken to ensure that the root ball is not damaged by the heavy equipment used for detaching and raising it.
* If thick roots are exposed beneath the root ball they should be cut with a sharp tool (chain saw).
* The tree and its root ball should be raised by a crane truck with a platform. The lifting capacity of the crane should be adjusted for the weight of the tree and its root ball as well as for the distance between the location of the truck and either the planting hole or the location from which it is to be raised.
* If the planting hole is close to the uprooting site, the root ball may be moved with a bulldozer. Transplanting a tree in this way should be done only after authorization by the supervisor.
* No more than 6 hours should pass between uprooting and planting. In the event of an unexpected problem or delay in the timetable, the root ball should be covered with impermeable sheets and wet twice a day until planting.

**6 - Planting**

* The planting holes should be prepared in advance, before the trees reach the planting site.
* The circumference and depth of the holes should match the dimensions of the soil balls to be planted, with an additional 50 cm in both circumference and depth.
* Local soil should be used to fill the hole; the soil should not be contaminated with seeds of invasive plants.
* The required irrigation equipment should be prepared in advance, prior to detaching and planting.
* The planting hole should be filled with water, and the tree should be planted into wet soil, with gradual filling of the hole with soil. Extra water may be added as required, until the soil is distributed evenly and fills all the gaps between the roots to prevent formation of air pockets.
* The height of the root crown should be 20 cm above the final soil surface at the planting site.
* After half-filling the hole, compost and slow-release fertilizer should be applied at the edges of the soil ball.
* The hole should be filled with soil up to 10 cm above the soil surface. In any case the root crown should not be covered.

**7 – After planting**

* Two days after planting, a broad pit should be formed around the planting hole, for irrigating the tree with 1.5 m3 water.
* A permanent irrigation system with drippers should be installed immediately after completing the transplanting process. Two drip circles should be placed around the trunk at distances of 30-40 cm and 60-80 cm, respectively, from the root crown.
* The trees should be irrigated continuously with 0.5 m3 per month for a period of 3 years, weekly or biweekly. In the third year, trees should be irrigated biweekly to monthly. Inadequate aeriation due to excessive irrigation should be avoided.
* Soil moisture should be tested periodically by inserting a steel rod to a depth of at least 1 m.
* The irrigated area should be covered by wood chips to a depth of at least 20 cm, and a radius of 1 m around the trunk. The wood chip layer should be applied immediately after the first irrigation. The layer should be replenished every six months. Replenishment should continue for a period of one year after transplanting the tree.

**8 – Supervision and reporting**

* Once a month, the transplanting supervisor should assess the success of tree establishment. A report should be sent to the project manager and the landscape architect. Monitoring should continue for 3 years.

Dr. Jean-Marc Dufour-Dror

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