

THE PURPOSE OF FOREST PROTECTION PLAN IS TO ENSURE THAT sufficient forest and tree protection be carried out during the entire construction process. Figure 14 outlines the process that should be followed when developing a protection plan. Without protection, the impacts of construction activities to the roots, trunks and limbs of individual trees as well as to the forest floor can be severe (*Figure 15*).

Figure 14

OVERVIEW
OF
PREPARATION
OF
FOREST
PROTECTION
PLANS

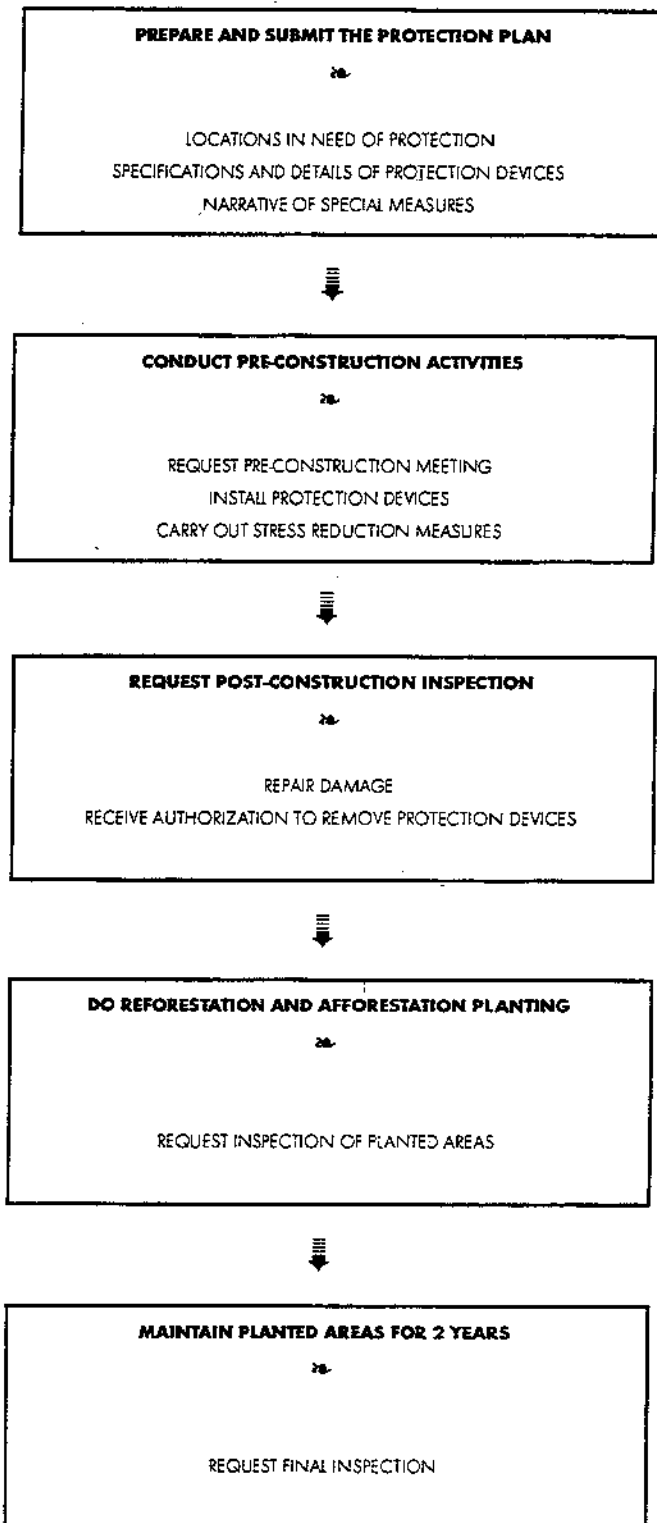
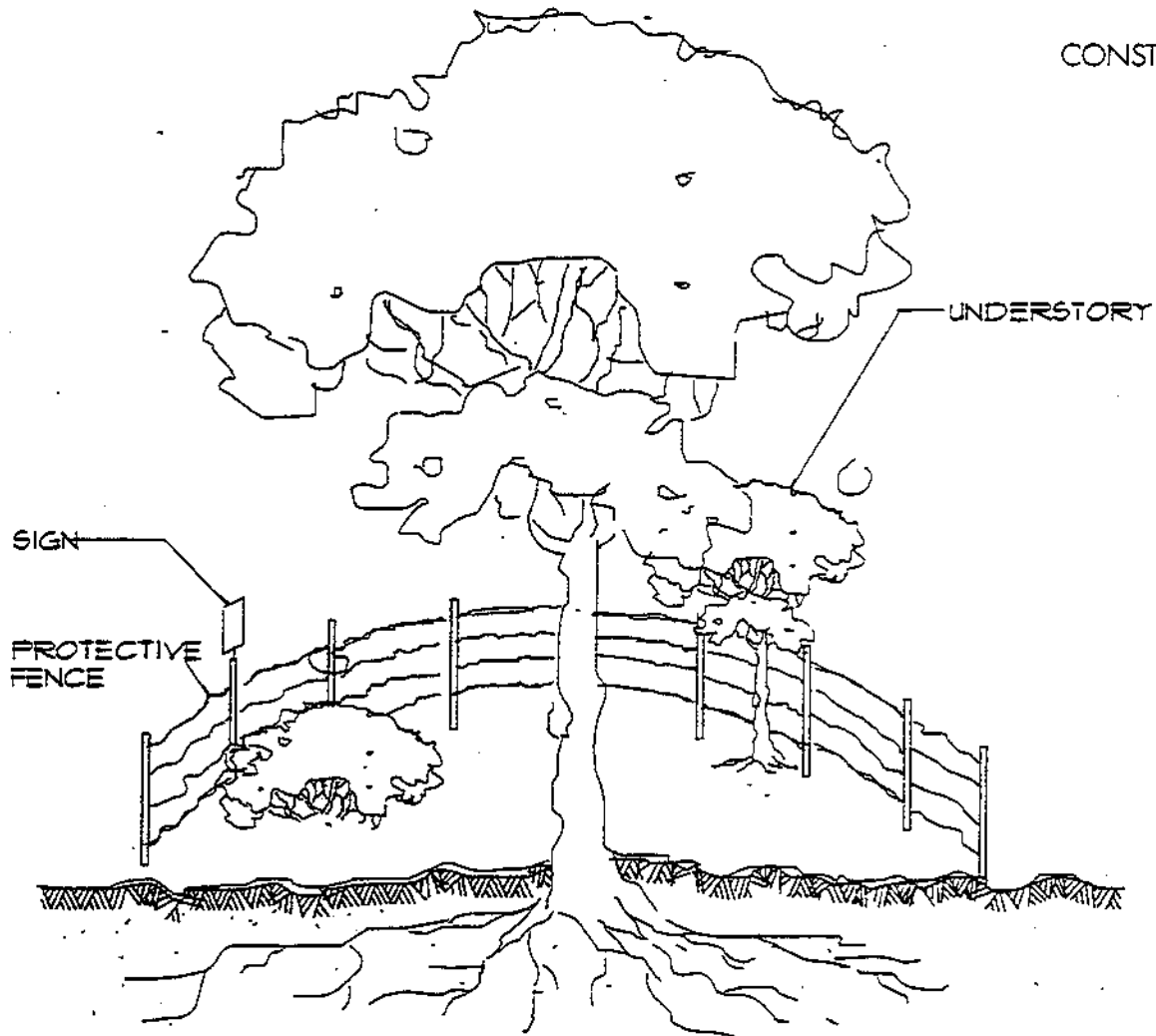


Figure 15

PROTECTING
TREES
DURING
CONSTRUCTION



PREVENT THE FOLLOWING IMPACTS:

CROWN

- . Broken or damaged limbs
- . Wounds to bark
- . Disease/insect infestation
- . Upper crown dieback

TRUNK

- . Sun scald
- . Wounds to bark
- . Disease/insect infestation
- . Wind-throw

CRITICAL ROOT ZONE

- . Tearing/Removal/Crushing/Burial
- . Soil compaction
- . Flooding
- . Dessication
- . Toxins
- . Changes in soil pH
- . Removal of understory

A. Preparation Of Protection Plan

The measures that will be necessary to ensure protection of forest and tree retention areas should be considered early in the forest conservation plan development process. Site grading will dictate what is necessary for protection. The protection plan must be developed concurrently with the final grading and sediment and erosion control plans. In general the final protection plan must be submitted with the final site grading prior to issuance of the sediment and erosion control permit. *(Some protection measures may be required earlier. See section B.)*

The protection plan should be overlaid on the final forest conservation plan, and must show:

- the locations of temporary and permanent protection devices
- stockpile areas and borrow pits
- specifications and details for the protection devices
- a narrative of stress reduction or other measures which are needed for specific trees.

B. Pre-Construction Phase

The pre-construction phase of development is the period of time between plan approval and the beginning of clearing and grading. At this time, the initial steps of the protection plan listed below must be put in place. They must be completed before Planning Department enforcement and monitoring staff will authorize the start of clearing and grading.

1. Pre-Construction Meeting

After the limits of disturbance have been staked and flagged, but before any clearing or grading begins, the applicant must request a pre-construction meeting at the construction site. The attendance at this meeting should include:

- the developer, contractor or project manager;
- the on-site (*subcontractor*) foreman, or superintendent in charge of land disturbing, clearing, sediment control and grading work;
- the tree professional contracted by the developer (*if applicable*); and
- the appropriate local inspectors.

The purpose of the meeting will be to field verify the limits of clearing specified on the approved plan, authorize necessary adjustments, and authorize installation of protection devices. Enforcement staff will also discuss the value and importance of the preservation areas and outline responsibilities and the possibility of violations and penalties. An additional inspection may be required after installation of the protection devices, and/or after initial clearing (*if selective clearing is planned*) before construction is authorized to begin.

2. Stress Reduction Measures

Trees along the edge of forest retention areas and specimen trees which are either part of the forest retention area or which stand alone are subject to various stresses during development. These trees must be evaluated by a qualified tree care professional to determine if they will experience any of the following impacts during any phase of the construction process.

- Damage to the critical root zone (*greater than 30% of the CRZ disturbed*): Grade changes, utility installation, excavation, soil compaction
- Altered natural conditions: Hydrology changes, removal of surrounding trees
- Damaging construction activities: Blasting, vibrations from equipment
- Extreme weather conditions: Temperature and moisture extremes

The applicant must provide a list of recommended stress reduction measures for each specimen tree. These measures must be taken as far in advance of construction in order to better the tree's chance for survival. Appropriate measures (*see Appendix D*) could include:

- ROOT PRUNING - Prune before construction using proper pruning equipment to ensure a clean cut. Exposed roots should be covered immediately with topsoil, peat moss or other suitable material.
- CROWN REDUCTION OR PRUNING - Remove no more than 1/3 of the crown using acceptable pruning standards at the specified times of the year.
- WATERING - Design a watering system as directed by a tree care professional.
- FERTILIZING - Apply a low nitrogen, slow release fertilizer in late fall or early spring.

- 2a. MULCHING - Mulch may be applied at a maximum of four to six inches (*minimum of 2 inches*).

3. Installation Of Protection Devices

Construction activities cannot take place in a forest retention area. This includes siting or construction of utility lines, access roads, staging areas, storage areas, temporary parking, stormwater management facilities, impervious surfaces, and limits of grading. Retention areas which are lost due to these types of impacts must be compensated by other retention areas or reforestation and afforestation and may subject the applicant to the non-compliance penalties as stipulated in the forest conservation law.

Protection devices must be installed around all forest and tree retention areas. Protection devices include those intended to protect plants during construction and those needed to ensure survival for the long term. Specifications for these measures are included in Appendix D.

SHORT-TERM FOREST PROTECTION DEVICES

These devices must be highly visible at least 4 feet high, and placed totally outside of the retention area. They are to be put in place prior to any land clearing or grading and shall be maintained during the entire construction phase including fine grading and final seeding. No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within the protected areas. None of these devices shall be in any way anchored or attached to the trees to be saved.

Short-term protection devices may include the following (*or others approved by staff*):

- 2a. Chain-link Fence
- 2a. Barbed Wire
- 2a. Snow Fencing
- 2a. Orange Plastic Fencing
- 2a. Signage
- 2a. Filter Cloth
- 2a. Straw Bale Dike
- 2a. Perimeter Dike or Swale
- 2a. Jersey Barriers

PERMANENT FOREST PROTECTION DEVICES

These measures should be taken when a significant portion of the critical root zone of a specimen tree or retention edge is impacted by construction such

that without these measures the trees will die. These devices include:

- root aeration systems
- retaining walls
- raised sidewalks
- pier and panel walls
- tunneling

During the life of the project, enforcement staff will perform periodic inspections. These inspections shall typically take place during and just after the clearing has taken place, after major storm events, during and after trees have been newly planted and in response to complaints from citizens or others. Enforcement staff will give written notice of any problems to the project manager who will be expected to correct them in a timely manner. Recommendations from a qualified tree care professional may be required if inspection staff determines that it is necessary. Failure to respond appropriately to written notice will cause the site to be placed in non-compliance and penalties shall be applied.

Problems caused by construction impacts may include:

- Dead dying or hazardous trees or tree limbs
- Protective barriers need repair or replacement
- Storage of material, stockpiles or trash in retention areas
- Excessive flooding or siltation of the retention areas
- Overclearing

C. Construction Phase

D. Project Completion Phase

1. Corrective Measures

An inspection should be requested after construction has been completed. At this time, enforcement staff may require that a qualified tree professional be consulted to evaluate the remaining trees and suggest corrective actions. When the problem is directly related to damage or impacts which occurred during the construction process, corrective action must be taken. These measures, which must be carried out by a qualified tree professional, include the following:

- Removal of Dead or Dying Trees (*Should be limited to the individuals which could be hazardous with the others being left*)

for wildlife. Removal should be authorized by enforcement staff.)

- Pruning of dead or declining limbs
- Soil Aeration
- Fertilizing
- Watering
- Wound Repair
- Clean up retention areas

2. Inspection And Approval

Following the completion of all corrective measures, the applicant will request an inspection by staff. The project inspector will inspect the entire site for compliance with the forest conservation plan. The limits of disturbance will be measured against those of the original plan. If any portion of the retention areas are found to be damaged or destroyed, or if trees have died due to negligence, a noncompliance fee will be assessed per square foot of damaged or destroyed forest area. Penalties shall not apply to tree which are destroyed by natural causes. Noncompliance will also apply to areas where the temporary structures have not been removed and where trash or excessive silt layers are left in the retention areas.

Certification that corrective measures have been undertaken and that the remaining trees are likely to survive may be required by a qualified tree care professional hired by the applicant. Upon receipt of this certification, authorization will be given to remove temporary protection structures.

3. Removal Of Temporary Structures

After construction has been completed, it is necessary to remove all temporary structures such as roadways, short-term protection devices, and sediment control devices. During this stage, the following should be considered:

- No burial of discarded materials will occur on-site.
- No additional clearing or disturbance shall take place around the trees except by hand and as approved by a county official. Hand removal of vines, excessive dead material and pre-existing trash may be permitted.
- No clearing for the purpose of sodding or planting grass shall be permitted within the forest conservation area.

E. Extended Maintenance Phase

The extended maintenance phase begins when afforestation or reforestation areas are planted, or as specified in the approved construction timetable. The applicant will be required to maintain planted areas for a two year period. Protection measures such as signage or fencing may be needed during this time. At the end of the maintenance period, a final inspection shall be requested. Enforcement staff will authorize release of financial security after confirming that the site meets the survival requirement. If the survival rate falls below the requirements, the financial security will not be released until re-enforcement planting has been provided.

The criteria for release of the security after the two year maintenance period includes:

- 100 trees per acre or at least 75% of the total trees planted per acre (*whichever is greater*) must be alive and in good condition
- In areas established as forest cover, 75% of the shrubs must also be alive and in good condition after two years

F. Summary Of The Requirements

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| <ul style="list-style-type: none"> • develop protection plan concurrently with grading and sediment control • specifications and details • narrative of necessary stress reduction procedures | <p>STEP 1
Forest Protection Plan</p> |
| <ul style="list-style-type: none"> • stress reduction • pre-construction meeting • installation of protective devices | <p>STEP 2
Pre-Construction Activities</p> |
| <ul style="list-style-type: none"> • periodic inspections | <p>STEP 3
Construction Activities</p> |
| <ul style="list-style-type: none"> • repair of damage • removal of temporary protective measures | <p>STEP 4
Post-Construction Activities</p> |
| <ul style="list-style-type: none"> • Final inspection and release of financial security | <p>STEP 5
Maintenance Period</p> |

