

# **Guidelines on Arboriculture Occupational Safety and Health**

**GREENING, LANDSCAPE AND TREE MANAGEMENT SECTION  
DEVELOPMENT BUREAU**

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## **1.0 Introduction**

1.1 Risk is inherent in all forms of works and tree work is no exception. A culture of safety and health is essential in any organization. This should permeate all levels of the organization and be established and maintained through training, qualifications, procedures, etc. Under **Section 6(1) of the Occupational Safety and Health Ordinance**, *“Every employer must, so far as reasonably practicable, ensure the safety and health at work of all the employer's employees.”* Employer covers both the employer of a company and of a service contract.

1.2 Tree work includes pruning, tree removal, cabling, bracing, guying, cavity treatment and/or other arboricultural treatment to be undertaken at ground or elevated level. Tree work, if not properly carried out with adequate safety measures, can be hazardous for those engaged in it and for people and property in the vicinity of the work.

1.3 Provision of a safe system of work is essential and tree work should be undertaken by trained and experienced personnel. A suitable and safe method should be adopted and adequate occupational safety and health measures should be implemented in carrying out the tree work. Such information, instruction, training and supervision as may be necessary to ensure, so far as reasonably practicable, the safety and health at work of the employer's employees should also be provided.

## **2.0 Provision of a Safe System of Work**

2.1 A safe system of work is a formal procedure which results from systematic examination of a task in order to identify all the hazards. It defines safe methods to ensure that hazards are eliminated or risk minimized.

2.2 Where hazards cannot be eliminated and some elements of risk remain, a safe system of work should be developed and put in place before commencement of tree work.

2.3 Employers responsible for tree work should provide and maintain safety system of work to ensure the safety and health of the employees/workers involved in tree work. This requires the employers to assess the task, identify the hazards, define safe methods, implement the system and monitor the system.

2.4 Reference should be made to the Labour Department's prevailing guidelines on occupational safety and health including “Safe System of Work” and “Five Steps to Information, Instruction and Training” (<http://www.labour.gov.hk/eng/public/index.htm>).

### **3.0 Team Work**

3.1 Tree work is a team work which should be carried out by trained and experienced personnel. The employer should assign a Tree Work Supervisor who is competent to supervise the tree work to ensure that the work is carried out in accordance with good arboricultural practice and adequate occupational safety and health measures, including procedures as laid down in the safe system of work.

3.2 Workers participating in tree work operations should receive relevant training for the assigned tasks to be performed. As a general rule of thumb, tree work operations should not be performed alone by a Tree Worker and effective communication should be maintained between members of the team. The team should include Tree Work Supervisor and Tree Workers who have met the requirements as detailed in Annex I.

### **4.0 Adoption of a Suitable and Safe Method**

4.1 The Tree Work Supervisor should assess the task, identify the potential hazards, evaluate the risks and formulate the most appropriate and safe method to carry out the tree work. Risk assessment on the potential hazards, method to be adopted and relevant occupational safety and health measures to be implemented should be prepared and properly documented and communicated to all personnel involved in the tree work.

4.2 Wherever practicable, the work should be carried out from ground level. This may be achieved by using suitable job method such as using extending equipment or tools to perform the work from ground level.

4.3 If it is inevitable to work at height, appropriate access equipment such as elevating work platforms, scaffolds, podium steps or ladders should be used as safe means of access. Also, elevating work platforms and scaffolds should be used to provide safe means of support when work is being carried out.

4.4 In situations where the use of the above means are not reasonably practicable, other alternative means, such as the use of rope access system, can be considered. The Tree Work Supervisor should confirm the appropriateness of the method if rope access is adopted. The aerial tree work by climbing should be carried out by Tree Workers satisfying the requirements in Annex I(C) (i.e. Tree Worker (Tree Climbing)). Relevant safety practices/instructions and devices in accordance with recognized standards should apply (please refer to paragraph 5.6 below).

4.5 Before carrying out the tree work on site, risk assessment on the potential hazards, method adopted, occupational safety and health measures

should be properly documented and communicated to all personnel involved in the tree work.

## **5.0 Occupational Safety and Health Measures**

### **5.1 General**

5.1.1 Compliance with the relevant prevailing occupational safety and health requirements and guidelines as promulgated by Labour Department is essential. The following paragraphs introduce the general occupational safety and health measures, which are not exhaustive, associated with tree work for reference. All Tree Workers should receive relevant training for the required skills in carrying out tree work. The Tree Work Supervisor should formulate specific occupational safety and health measures to suit the operation.

5.1.2 When tree work is to be conducted at or near public area, the Tree Work Supervisor should assess potential hazards to the public. Appropriate measures, such as provision of warning signs, temporary fencing and/or guarding, should be adopted when there is a potential risk affecting the public.

### **5.2 Good Communication**

5.2.1 Good communication should be maintained between Tree Workers and Tree Work Supervisor involved in the tree work so that each one is well aware of the duty, work arrangement, potential hazards, occupational health and safety measures and progress of the operation. A job briefing should be provided before tree work begins to facilitate good communication in carrying out the tree work on site.

### **5.3 Personal Protective Equipment (PPE)**

5.3.1 Tree Workers should wear appropriate clothing and footwear. Loose-fitting clothing and slippers should not be allowed. The PPE includes, but is not limited to, head protection (helmets), reflective vests, protective gloves, sturdy boots, chainsaw-resistant chaps, safety goggles and hearing protection. They should comply with relevant standards to suit the work required.

5.3.2 Suitable and adequate PPE should be provided for use by Tree Workers involved in carrying out tree work. They should also be trained in the proper use, care and maintenance of PPE.

5.3.3 The employer should implement a monitoring system to ensure proper use of the PPE by the workers. Proper maintenance programme of the PPE so provided by the employer should be in place to ensure that the PPE is kept in a serviceable state as well as a safe-to-use manner.

## **5.4 Traffic Flow**

5.4.1 For tree work to be performed in area with traffic flow, Temporary Traffic Arrangement (TTA) has to be instituted to protect the safety of the public as well as the Tree Workers. Adequate lighting, signing and guarding complying with the requirements of "Code of Practice for the Lighting, Signing and Guarding of Road Works" issued by Highways Department should be provided (<http://www.hyd.gov.hk/eng/public/publications/index.htm>).

## **5.5 Underground Utilities**

5.5.1 Underground utilities include gas pipes, electrical cables, cables for telephones, water pipes, drainage and sewerage pipes buried underground. Tree work, such as planting or removal of tree stump, may cause damage to underground utilities which in turn poses hazards. The presence of underground utilities should be checked and identified on site with adequate precautions if the required excavation or stump removal work, particularly removal of large deep-rooted stump along public pavement, may affect the underground utilities.

5.5.2 When working in the vicinity of utilities, hand tools should be used with due care. Relevant utility companies should be contacted for precautionary protection measures.

## **5.6 Work at Height**

5.6.1 If work at height is required, a safe access, egress and working condition to prevent fall from height, including steep slope, should be provided. The following publications and the prevailing guidelines issued by the Labour Department are relevant (<http://www.labour.gov.hk/eng/public/index.htm>).

- ◆ “Safety at Work – A Guide to Ladders and Elevated Working Platforms”
- ◆ “Guidance Notes on Safe Use of Power-operated Elevating Work Platforms”

- ◆ “Code of Practice for Metal Scaffolding Safety”
- ◆ “Code of Practice for Bamboo Scaffolding Safety”
- ◆ “Guidance Notes on Classification and Use of Safety Belts and their Anchorage System”

Other relevant references include:

- ◆ “2011 Best Practice Guidelines for Safety and Health in Tree Work Part one: Arboriculture” New Zealand: The New Zealand Arboricultural Association: 2011.
- ◆ “A Guide to Good Climbing Practice” UK: The Arboricultural Association: 2005.
- ◆ “AFAG 401 Tree-climbing operations” UK: The Health and Safety Executive.
- ◆ “American National Standard for Arboricultural Operations – Safety Requirement (ANSI® Z133.1-2006)”. Champaign: International Society of Arboriculture: 2006.

## **5.7 Falling Objects**

5.7.1 Falling objects may include materials, tools, debris and/or cut tree parts falling from height. Loose tools should be carried in tool bags and properly secured. Throwing of large cut tree parts from height should be avoided as far as possible. Where a working platform is used, the working platform should be fully boarded and toe-boards alongside the edge of working platform should be installed.

5.7.2 Where members of the public may be present within the tree work area, measures to ensure their safety should be instituted e.g. cordoning off the work area with suitable barriers, erecting appropriate warning signs and arranging Tree Workers to guard the work area.

## **5.8 Manual or Mechanical Handling**

5.8.1 To reduce the hazards associated with lifting or delivery of tree parts, large tree parts should be cut into smaller manageable sizes. The size of tree parts should be determined by the Tree Work Supervisor to avoid overloading, taking into account the working load of the equipment, machinery and environmental

condition e.g. strong wind.

5.8.2 Tree parts, particularly sizable pieces, should be secured properly before cutting and delivery. Care should be taken for possible physical damage to the Tree Worker caused by swinging of tree parts during operation.

## **5.9 Impact with Overhead Obstacles or Tree Parts**

5.9.1 Overhead obstacles should be identified, particularly overhead electrical lines and apparatus. Adequate safety precautions, including keeping safe clearance from overhead obstacles should be adopted in carrying out tree work. When elevating work platform is in use, the travelling route should be within the vision of the operator of the platform.

5.9.2 In tree felling operations, the tree can split upward from the back cut (known as “barber chair”) which may hit the Tree Worker standing directly behind the tree. The Tree Worker should stand to one side of the tree when making the back cut and plan for an escape route on either side 45° opposite to the direction of fall. Adequate steps should also be taken to prevent tree trunk from rolling on sloping site when the branches are removed to minimize hazards to the Tree Worker.

## **5.10 Electrical Hazards**

5.10.1 Tree Workers should receive relevant training in handling electrical hazards. Electrical hazards should be identified before performing tree work. These include the existence of overhead power lines, underground cables or electrical apparatus and the use of electrical tools. A safe working distance from overhead electrical line or electrical apparatus should be maintained when carrying out tree work. Reference should be made to the “Code of Practice on Working near Electricity Supply Lines” issued by the Electrical and Mechanical Services Department.

## **5.11 Use of Equipment**

5.11.1 All equipment, including hand tools or machinery, should be inspected prior to operation and should be properly and regularly maintained. The equipment should be fit for the purposes and should comply with relevant standards with evidence of conformity.

5.11.2 Tree Workers should use all equipment in correct posture. They should



receive relevant training in the use of hand tools and mechanical equipment, such as pole pruner and chainsaw, so that hazards associated with the use of them can be minimized.

## **5.12 Heat-Related Disorders**

5.12.1 Heat-related disorders include heat stroke, heat cramps and heat exhaustion. They are associated with working under prolonged and/or high environmental heat exposure which results in overheating and dehydration.

5.12.2 As precautionary measures, wearing of suitable clothing to facilitate heat dissipation and provision of adequate drinking water and rest breaks to Tree Workers are required. Training on the awareness of heat-related disorders and associated first aid procedures should be provided to all personnel involved in tree work.

## **5.13 Application of Chemicals**

5.13.1 Application of chemicals, such as fungicides and insecticides, is a common practice in tree care operations. The chemicals should be properly labeled and stored in a cool, dry and well-ventilated place away from direct sunlight and dampness. Dosages and application methods as recommended by the manufacturers should be followed. Disposal of chemicals should follow an approved hazardous waste management procedure.

5.13.2 The intake of chemicals can be made through direct contact, inhalation and/or ingestion. Tree Workers should wear suitable protective clothing, gloves, goggles or face shields to prevent direct contact with chemicals. Properly fitted respirators should be worn to protect Tree Workers from inhaling harmful chemicals. Eating or smoking should not be allowed during chemical applications and before cleansing procedures have completed after chemical applications.

5.13.3 Tree Workers should also take note of the surroundings and minimize harms to the public caused by inhaling or contacting chemicals. This includes guarding the site with warning notices and paying attention to the wind direction during spraying to avoid spreading chemicals. If required, warning notices should be posted to keep people and their domestic animals off the site after application of chemicals.

## **5.14 Inclement Weather**

5.14.1 This includes poor weather conditions, such as strong wind, thunderstorm and heavy rainstorm, which adversely affect the safe operation of

tree work. With the exception of emergency work performed by well-trained Tree Workers having adopted necessary safety precautions, no tree work should be carried out during inclement weather.

## **5.15 Hazards associated with Plants and Animals**

5.15.1 These hazards include bites by snakes or insects (such as mosquitoes, bees and Red Imported Fire Ants) and direct contact with poisonous plants. Training should be provided for identification of hazardous plants and animals and the associated treatment.

5.15.2 Tree Workers should wear suitable clothing and gloves to minimize skin exposure to insect bites and scratches by poisonous plants. They should apply insect repellent to exposed skin when required. If severe reactions upon bites or contact with poisonous plants are observed, prompt medical treatment should be sought.

## **5.16 Fire Precautions**

5.16.1 Fire may result from improper use of gasoline-powered equipment. Smoking should be prohibited when handling flammable liquid. Trucks transporting tree work equipment should be equipped with fire extinguishers and Tree Workers should be trained to use fire extinguishers in case of fire to reduce the risk of personal injury and spread of fire to other wooded area.

## **5.17 First-aid and Emergency Procedures**

5.17.1 Procedures covering emergency arrangements, rescue and first aid procedures should be formulated and well-communicated to the Tree Workers by the Tree Work Supervisor. Emergency drills should be regularly conducted, with the performance properly recorded and reviewed. First-aid kits with appropriate medical and rescue contents should be provided and maintained.

5.17.2 For tree climbing operations, a minimum of two Tree Workers must be present and one of them should be stationed on the ground, competent and equipped to perform aerial rescue without delay.

**Requirements of Tree Work Supervisor and Tree Workers**

**A) Tree Work Supervisor**

A Tree Work Supervisor is a person who has:

<b>Training</b>	(a) received relevant training in occupational safety and health relating to tree work operation covering, hazard identification, risk assessment and supervision, and
	(b) (i) completed training in tree work operations provided by trainers with practical experience and expertise recognized by the employer; or (ii) completed training or vocational assessment in tree work operations offered by recognised institutions or industry organisations; or (iii) be a Certified Arborist of the International Society of Arboriculture, Registered Arborist (Level 3 or above) of Arboriculture Australia, Technician Member or above of the Arboriculture Association of the United Kingdom or the Accredited Arboricultural Practitioner of the Hong Kong Institute of Landscape Architects, those having taken the Professional Diploma Programme in Arboriculture of the Chinese University of Hong Kong or equivalent or above, and
<b>Work Experience</b>	(c) with at least 2 years work experience in tree care.

**Notes:**

- a) Training in tree work operations provided by trainers with practical experience and expertise recognized by the employer include in-house training provided by government departments.
- b) Examples of recognized institutions or industry organizations include Occupational Safety and Health Council, Vocational Training Council and Construction Industry Council.
- c) The employer may appoint two persons to cover for the above requirements in (1) arboricultural and (2) occupational safety and health aspects separately if necessary. Each of them should have at least 2 years relevant work experience. However, they should work together to address the occupational safety and health issues associated with tree work.

**B) Tree Worker**

A Tree Worker is a person who has:

<b>Training</b>	(a) received basic training in occupational safety and health relating to tree work operation; and
	(b) (i) completed relevant job/task specific training in tree work operations by trainers with practical experience and expertise recognized by the employer; or  (ii) completed relevant job/task specific training or vocational assessment in tree work operations by recognized institutions or industry organisations; and
<b>Work Experience</b>	(c) with at least 1 year work experience in tree care if aerial tree work is involved.

**C) Tree Worker (Tree Climbing)**

A Tree worker (Tree Climbing) is a person who has:

<b>Training</b>	(a) received basic training in occupational safety and health relating to tree work operation; and
	(b) (i) completed training in tree work operations (including tree climbing (rope access), use of chainsaw and aerial rescue) by trainers with practical experience and expertise recognized by the employer; or  (ii) completed training or vocational assessment in tree work operations (including tree climbing (rope access), use of chainsaw and aerial rescue) by recognized institutions or industry organisations; or  (iii) be a “Certified Tree Worker Climber Specialist” of the International Society of Arboriculture, those having taken Professional Diploma Programme in Arboriculture of the Chinese University of Hong Kong or equivalent or above; and
	(c) with at least 1 year work experience in tree care.

**Notes:**

- a) Training in tree work operations provided by trainers with practical experience and expertise recognized by the employer include in-house training provided by government departments.
- b) Examples of recognized institutions or industry organizations include Occupational Safety and Health Council, Vocational Training Council and Construction Industry Council.