AGENTURA OCHRANY PŘÍRODY A KRAJINY ČESKÉ REPUBLIKY

Lesnická a dřevařská fakulta Mendelova univerzita v Brně

NATURE AND LANDSCAPE MANAGEMENT STANDARDS

ARBORIST STANDARDS	**CARE OF WOODY PLANTS ALONG UTILITY LINES**	**SPPK A02 011:2018**
SERIES A		

Péče o dřeviny kolem veřejné technické infrastruktury

Pflege der Bäume und Sträucher entlang Stromleitungen

This standard is intended as a definition of technical and work procedures for ensuring safe and reliable operation of transmission and distribution systems of public technical infrastructure.

References:

PNE 33 3300-0 (2010): Proposal for Change to ČSN EN 50341-3/Z2:2007 Outdoor power lines with voltages above 45 kV AC, National standardization aspects for the Czech Republic.
PNE 33 3301 (2008): Outdoor power lines with voltages above 1 kV AC up to 45 kV, included.
PNE 33 3302 (2010): Outdoor power lines with voltages up to 1 kV AC.
PNE 33 0000-6 (2007): Operation and work on electric equipment for electricity generation, transmission and distribution.
TPG 90501 (2013): Basic requirements for operating safety of gas works equipment.
ČSN EN 1594 (2014): Gas supply equipment – Gas pipelines with maximum operating pressure above 16 bar – Functional requirements.
ČSN EN 12007-1 to 4 (2013): Gas supply equipment – Gas pipelines with maximum operating pressure up to 16 bar, included.
ČSN EN 50423-1 to 3 (2005): Outdoor power lines with voltages above 1 kV AC up to 45 kV, included.
ČSN EN 50341-3 (2013): Outdoor power lines with voltages up to 45 kV AC.

Act no. 89/2012 Coll., the Civil Code, as amended.
Act no. 114/1992 Coll. on Nature and Landscape Protection, as amended.
Act no. 127/2005 Coll. on Electronic Communications and on amendment of certain acts (Electronic Communications Act), as amended
Act no. 183/2006 Coll. on Spatial Planning and Building Rules (Building Act), as amended
Act no. 458/2000 Coll. on Requirements for Business and Public Administration in Energy Industries and on amendment of certain acts (Energy Act), as amended
Act no. 500/2004 Coll., Rules of Administrative Procedure, as amended

Decree no. 189/2013 Coll. on Felling Permission Process, as amended
Decree no. 395/1992 Coll., Executing some Provisions of Czech National Council Act no. 114/1992 Coll. on Nature and Landscape Protection, as amended
Decree no. 50/1978 Coll. on Professional Qualification in Electrical Engineering, as amended

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I . Standard purpose and contents

1.1 Standard purpose

1.1.1 The standard "Care of woody plants along utility lines" defines the scope and techniques of interventions in woody plants implemented in order to ensure safe and reliable operation of public technical infrastructure (PTI) pursuant to Act no. 458/2000 Coll.

1.1.2 The standard describes the scope of possible interventions in woody plants to prevent unpermitted interventions in non-forest trees (see Section 7, Para. 1 of Act no. 114/1992 Coll. and Section 2 of Decree no. 189/2013 Coll.).

1.1.3 The standard is intended for application to woody plants growing outside forest around PTI components. It can be applied adequately to woody plants growing on land intended for performance of forest functions.

1.2 Qualifications of persons

1.2.1 Owners or users of land plots on which woody plants pose a threat to safe and reliable operation of PTI make interventions in the woody plants at their own risk while respecting occupational safety rules and adhering to applicable legal and technical standards.

1.2.2 In cases where an intervention in the woody plants poses a threat to lives or health of people or the PTI components themselves, the land owners or users always proceed with the approval of the PTI operator under conditions set for the work.

1.2.3 Qualification requirements for persons making interventions in woody plants growing around PTI components at the expense of the PTI operator are specified by the applicable PTI operator with a view to potential safety risks and legal regulations in force. The applicable PTI operator may also specify whether interventions into woody plants around PTI components require supervision and the minimum qualification of such personnel.

1.2.4 **Basic tree inspection** as part of PTI condition checks pursuant to 4.2 is made by trained persons authorised by the PTI operator.

1.2.5 The recommended qualification for persons performing **tree pruning at a height** around PTI is at least completed secondary education in the field or another recognised national or international proof of professional knowledge in the area of arboriculture, qualification for safe movement in the tree crown using climbing equipment or lift platform and safe handling of the chainsaw.[1]

1.2.6 Tree assessment is of an interdisciplinary nature and involves analysis of a wide range of factors. It is an expert activity that has to be done by qualified persons, who may be:

- judicial experts under Act no. 36/1967 Coll. with a specialisation including tree assessment or similar, or

[1] *For example, European Treeworker, ISA Certified Tree Worker Aerial Lift Specialist, ISA Certified Tree Worker Climber Specialist, ABA International level A2, Czech Certified Arborist – Platform Worker, Czech Certified Arborist – Tree Climber, Arborist Technician, etc.*

- graduates from study programmes and specialisations of faculties of forestry, horticulture, scientific, environmental, etc., where tree assessment issues are taught, or
- holders of a national or international proof of expert knowledge in the area.[2]

[2] For example, Czech Certified Arborist – Consultant, European Tree Technician, etc.

2. Legal framework

2.1 Protective zones around PTI are defined in **Act no. 127/2005 Coll**. and **Act no. 458/2000 Coll**.

2.2 Pruning of woody plants in non-forest environments can generally be performed by the owner or another authorised person without prior permission or notification of a nature protection authority to the extent and using a technique that does not result in unpermitted intervention in non-forest trees (see **Section 7, Para. 1 of Act no. 114/1992 Coll.** and **Section 2 of Decree no. 189/2013 Coll.**).

2.3 An exception from 2.2 comprises woody plants with a special protection regime pursuant to **Act no. 114/1992 Coll.**:

- woody plants promulgated as memorable (Section 46, Para. 2),
- woody plants representing a biotope for specially protected species (Section 56), specially protected species of wild woody plants, i.e., European yew, Bohemian rowan, Sudeten rowan, dwarf common juniper (Section 56),
- the intervention cannot result in damage or destruction of nests and eggs of wild birds or their death or significant upsetting, particularly during nesting, unless the nature protection authority has specified a different procedure (Section 5b, Para. 1),
- woody plants that are part of a notable landscape feature (Section 4, Para. 2).

In such cases, tree treatment requires prior adequate administrative action of the applicable nature protection authority.

2.4 Tree pruning carried out in protected heritage areas and zones that are a cultural monument, national cultural monument, heritage reserve, heritage zone or are within the protective zone of an immobile cultural monument, heritage reserve or heritage zone has to be in accordance with **Act no. 20/1987 Coll.** (for instance, the general obligation of everybody to act so as not to cause any adverse change in condition of cultural monuments or their environment pursuant to Section 9, Para. 3, etc.).

2.5 Tree pruning around PTI components has to be arranged by the land owner or user. If they neglect their obligation even after prior notification and definition of extent, persons authorised by the PTI operator have authorisation to perform the adequate pruning to the necessary extent.

2.6 Entry to other owners' land and the right to prune woody plants to assure safety and reliable operation of transmission and distribution systems (in power and gas industries), mining gas pipelines, gas production facilities and transport system, if the landowner or user has not done so after prior notification and definition of extent, proceed based on authority defined by **Act no. 458/2000 Coll.**

3. Woody plant planting and removal

3.1 Planting distances

3.1.1 Terms and conditions for presence and growth of woody plant vegetation around PTI in the power and gas industries are defined in Act no. 458/2000 Coll. and Act no. 127/2005 Coll.

3.1.2 Planting of new woody plants is possible only outside defined protective zones (see Annex 1).

3.1.3 For selected types of PTI, shrubs up to 3 m tall and temporary trees (such as fruit orchards, Christmas tree plantations, etc.) can be planted. These plantings require an approval with activity within the protective zone, which should also handle subsequent site modification after the completion of the permitted activity.

3.1.4 Planting of woody plants in open strips of land in forest firebreaks defined by Act no. 458/2000 Coll. for selected PTI types (if such an open strip is required) is inadmissible. These open strips of land are maintained by the PTI operator at its own expense, and the owner or user of the concerned property has to enable the maintenance.

3.1.5 Tree planting on non-forest land follows SPPK A02 001 Planting of trees; shrub planting follows SPPK A02 003 Planting and pruning of shrubs and climbing plants.

3.2. Removal of inappropriately growing woody plants

3.2.1 The PTI operator is authorised to regularly remove woody plants growing in protective zones of PTI components that pose a threat to their safe and reliable operation, notably due to inappropriate planting, neglected care or natural renewal.

3.2.2 If a collision between the protective requirements of overhead PTI lines and woody plants makes it impossible to perform satisfactory reduction or other pruning without seriously and irreversibly damaging the woody plant, its felling can be regarded as the better option.

3.2.3 Removal of inappropriate woody plants on **land intended for performing forest functions** is made based on negotiation with the forest manager.

3.2.4 Removal of **canopied tree vegetation in protective zones** with a total area above 40 m^2 on **non-forest land** requires notification to the locally competent nature conservation 15 days before any felling in the protective zone.

3.2.5 Removal of **trees within protective zones of PTI components** with a trunk circumference at breast height (1.3 m) above 80 cm **on non-forest land** requires notification to the locally competent nature conservation authority 15 days before any felling (with the exception of felling pursuant to 3.2.8).

3.2.6 Any need to **remove trees outside a protective zone on non-forest land** requires approval of the land owner and, as the case may be, negotiation of a felling permit with the locally competent nature conservation authority (with the exception of felling pursuant to 3.2.8).

3.2.7 Prior administrative action of the competent nature conservation authority is required for removal of woody plants in the following cases:

- woody plants promulgated as memorable (memorable tree protection has to be lifted before felling, Section 46),
- woody plants representing a biotope for specially protected species (Section 56),
- specially protected species of wild trees, i.e., European yew, Bohemian rowan, Sudeten rowan, dwarf common juniper (Section 56),
- woody plants that are part of a notable landscape feature (Section 4, Para. 2),
- the felling cannot result in damage or destruction of nests and eggs of wild birds or their death or significant upsetting, particularly during nesting, unless the nature protection authority has specified a different procedure (Section 5b, Para. 1),
- the felling poses an intervention in landscape character (Section 12).

3.2.8 In the case of detection of a tree whose condition **apparently and immediately threatens safety** or poses a risk of considerable damage (both within protective zones and within impact distance from PTI components), the defect is documented and the tree is felled immediately. Within 15 days of the felling, the PTI operator or a person specified by the PTI operator has to inform the applicable nature protection authority about the felling pursuant to Section 8, Para. 4 of Act no. 114/1992 Coll.

3.2.9 The tree felling shall respect SPPK A02 005 Tree felling.

4. Inspection of PTI equipment condition

4.1 Purpose of inspection

4.1.1 In order to reduce the risk of fall of trees or their parts on PTI components, inspection of PTI equipment condition involves basic inspection of the condition of trees growing within protective zones and around PTI. At the same time, inspection to rule out the risk of dangerous approach of vegetation to lines is made in protective zones.

4.1.2 Basic inspection of tree condition is made periodically with a view to safe and reliable operation of PTI; see 4.2. Intervals and dates of inspections are defined by the PTI operator's internal regulations.

4.1.3 **Basic inspection** of tree condition is arranged by the PTI operator.

4.1.4 In justified cases, it is recommended to develop a **comprehensive assessment** of tree condition pursuant to SPPK A01 001 Tree assessment, made by a professional with qualifications pursuant to 1.2.6.

4.1.5 Justified cases under 4.1.4 are, for example:

- trees growing as part of prominent landscape features,
- tree with a trunk diameter of more than 1 m at a height of 1.3 m (trunk circumference above 3.14 m),
- trees with documented presence of specially protected species,
- trees featuring major defects pursuant to 4.3.

4.1.6 The following scope of inspection is associated with the basic inspection of condition of trees growing around PTI components.

4.2 Scope of basic inspection of tree condition

4.2.1 Basic inspection of tree condition is made using visual examination methods.

4.2.2 All defects resulting from conflicts between PTI and woody plants, including fire outbreak risk assessment, are registered.

4.2.3 Major tree defects are registered only in the area of resistance to fracture; resistance to windthrow is only recorded in extreme cases of evident commencing failure.

4.2.4 A written inspection report is made from each inspection.

4.2.5 Records on inspection of PTI equipment condition, including tree condition, are maintained for entire PTI sections.

4.3 Major tree defects

4.3.1 **Significantly dry tree**. Necrosis of more than 50% of the crown, including primary boughs, can be a reason for felling.

4.3.2 **Cracked primary branching**. An evident crack in the area of primary branching can be a reason for felling. This includes notably narrow forks with ingrowing bark (known as compression forks).

4.3.3 **Massive infection by wood fungi**. Presence of fungal fruit-bodies on the trunk, primary boughs or in the immediate vicinity of the trunk base can be a reason for assessment of valuable trees by a qualified person pursuant to 1.2.6.

4.3.4 **Presence of cavities**. Open cavities in the bottom part of the trunk or in the area of primary branching can be a reason for felling the tree. Due to the high potential biological value of trees with cavities, the option to leave a torso instead of complete felling is considered notably in rural areas. Trees with detected presence of cavities should be assessed by a qualified person pursuant to 1.2.6.

4.3.5 **Extreme inclination**. A woody plant can be removed because a strong tree inclination towards PTI components, accompanied by signs of uprooting or cracks in the area of the trunk base.
A similar situation can be caused by a **significantly asymmetric crown** without the possibility of making it symmetric by local reduction. It is therefore advisable to assess the cause of the inclination by a qualified person pursuant to 1.2.6.

5. Pruning of trees

5.0.1 Pruning of trees around PTI components is governed by SPPK A02 002 Tree pruning. The rules shown below are an enumeration of basic rules and industry-specified principles.

5.1 Purpose of pruning

5.1.1 Trees around PTI components are pruned in order to assure safe and reliable operation of transmission and distribution systems.

5.1.2 The purpose of this type of pruning is both assurance of minimum required distance of conductors from vegetation and a basic stabilisation of trees.

5.2 Specific aspects of management of woody plants around PTI

5.2.1 The PTI operator or an authorised person negotiates any planned pruning of trees, including handling of the woody material produced, with the owner or user of the concerned land.

5.2.2 Use of cranes and similar types of machinery within protective zones of HV and VHV lines with the lines powered is only possible if requirements set by the power distribution system operator are met.

5.2.3 Pruning or felling of woody plants must not result in body parts or tools coming within:

- 0.3 m (ideally 1 m) from LV lines,
- 2 m from HV lines,
- 3 m from VHV lines.

5.3 Securing of protective zones

5.3.1 **Protective zones** of PTI are specified in Annex 1. Moreover, HV and VHV lines require an access strip 4 m wide on one side of the line.

5.3.2 Thehe distance between vegetation (tree and shrub branches and trunks) and live parts of power lines has to be such to prevent any threat to operation of the lines or persons moving under them.

5.4 Assuring a safety distance between woody plants and PTI (outdoor LV grid)

5.4.1 Pruning of woody plants has to take into account deflection of trees or parts of crowns due to climate effects (rain, snow, rime).

5.4.2 As a consequence of regular increment of woody plants, it is advisable to extend the safety distance (see Annex 1) by twice the length of the annual increment of the woody plant (no more than 2 m).

5.4.3 For isolated LV conductors, repeated contact of vegetation with the isolation surface has to be prevented, so preventing its damage.

5.5 Pruning technique

5.5.1 Side branches are pruned to the **branch collar (ring)**, i.e., the side branch is pruned at the exact boundary between the branch wood and the trunk wood. The cut is made immediately past the bark ridge and follows the "collar" of the trunk or parent branch so as not to damage it (see Annex 3, Fig. 1).

5.5.2 **Pruning of conifer branches**. Where the branch collar is evident, the pruning follows 5.5.1. If it is not evident, the cut is made at the exact boundary between the branch wood and the trunk wood, parallel to the trunk (without damaging it).

5.5.3 **Branch cutting "in three goes"** – in branches that cannot be (due to their weight) safely carried in one hand, a cut is first made from the bottom to the centre (approximately to 1/4 or 1/3 of the branch diameter) at approx. 100–300 mm from the branch collar. Another cut is made from the top down past the bottom cut (outwards) until the branch falls off without snagging bark or bast. The remaining stub is removed by a cut to branch collar or another suitable technique (Annex 3, Fig. 2).

5.5.4 **Pruning to side branch** is a pruning technique used for shortening (reduction) of a thicker branch to a thinner one so that the remaining part is able to take over the function of the removed branch. The cut is made past the bark ridge on the opposite side than in pruning to branch collar. The "one-third rule" is observed (see 5.6.4; see Annex 3, Fig. 4).

5.5.5 **Blind pruning** is a pruning technique used in exceptional cases for necessary massive reduction of branches that cannot be reduced to side branches or buds. It can be applied to woody plants with good crown regeneration. Afterwards, once the secondary shoots start to grow, withered portions of branches can be removed.

5.5.6 **Shoot pruning to base** – a very short cut made immediately above the shoot base so that the basal dormant buds are retained and can make new shoots.

5.6 Pruning wound size

5.6.1 The pruning wound size has to be minimised by removing only those parts of the crown necessary to meet the pruning objective. It is advisable to make more smaller cuts rather than a few larger cuts lower in the crown.

5.6.2 As a standard, the size of the pruning wound should not exceed 100 mm in diameter.

5.6.3 The diameter of the branch being removed should normally not exceed a maximum of 1/3 of the diameter of the parent branch or trunk; this is the so-called "one-third rule" (see Annex 3, Fig. 3).

5.6.4 When reducing branches, the remaining side branch has to be of a diameter equalling at least 1/3 of that of the removed branch; this is the so-called "one-third rule" (see Annex 3, Fig. 3).

5.6.5 If the pruning is done in trees with neglected maintenance or trees requiring removal pruning (S-SSK, S-RS), the wound size can generally exceed the specified sizes (see 5.6.2, 5.6.3).

5.7 Wound treatment and pruning periods

5.7.1 Wounds left after pruning are not brushed over as a rule.

5.7.2 Pruning in species with **intense spring sap flow** in early spring is possible. Profuse discharge of sap from the wounds is not interpreted as a process error.

5.7.3 The optimum period for tree pruning differs depending on the technique (see SPPK A02 002 Tree pruning):

full growing season (approximately April to September)	all types of establishing and maintenance pruning
outside growing season (approximately December to March)	stabilisation pruning (more extensive reductions), shaping pruning
any time of the year	local reduction (S-RL) and safety pruning (S-RB)

5.7.4 Performance of establishing and maintenance pruning outside the optimal periods is not viewed as process error.

5.8 Tree and site protection during pruning

5.8.1 Parts of the trunk and branches retained must not be injured, including disruption of the epidermis. Trees in the surroundings of the individual being treated must not be damaged.

5.8.2 Use of climbing irons in tree pruning is inadmissible.

5.8.3 Use of installation (lift) platforms must not result in compaction of soil within the projected area of the crown of a tree growing in an open area. If a tree grows in a paved area, platform traffic is only possible on the paved surface.

5.8.4 Pruning of a tree must not cause a reduction in the treated individual's operating safety or stability.

5.9 Selected pruning process categories

The following selected pruning process categories are typically considered when assuring safe and reliable operation of PTI. A complete list of pruning process categories, including descriptions, is made in SPPK A02 002 Tree pruning.

Maintenance pruning		
S-RB	Safety pruning	
S-RL	Local reduction pruning category	
	S-RLSP	Local reduction towards obstacle
	S-RLLR	Local reduction for stabilisation
	S-RLPV	Adjustment to underpass clearance profile
Stabilisation pruning		
S-RO	Perimeter reduction	
S-SSK	Secondary crown stabilisation	
S-RS	Removal pruning	
Shaping pruning		
S-RT	Shaping pruning	
Pruning of fruit trees		

5.9.1 Safety pruning (S-RB)

5.9.1.1 This type focuses only on assurance of current operating safety of the tree. It does not deal with comprehensive structural condition of the individual as a whole (e.g., risk of windfall, trunk breakage, crown disintegration, etc.).

5.9.1.2 S-RB removes or reduces branches or shoots:

- thick dead branches impairing operating safety;
- broken or cracked, of reduced stability;
- mechanically damaged;
- overgrown secondary shoots that pose a structural risk;
- with defective branching;
- hanging loosely.

5.9.1.3 S-RB can be carried out at any time of year.

5.9.2 Local reduction (S-RL)

5.9.2.1 The specified parameters apply to the following prune types:

S-RL	Local reduction pruning category	
	S-RLSP	Local reduction towards obstacle
	S-RLLR	Local reduction for stabilisation
	S-RLPV	Adjustment to underpass clearance profile

5.9.2.2 The object of S-RLSP and S-RLPV is to adjust the underpass clearance, reduce the crown in the direction towards an obstacle, attain a span distance defined by law, standard, etc., or produce a vista.

5.9.2.3 The objective of S-RLLR is local reduction in order to make a part of the crown lighter or more symmetrical and thus increase its stability.

5.9.2.4 The S-RL repeating interval has to consider the site, tree species, tree condition and nature of obstacle, extent of destabilisation as necessary, etc.

5.9.2.5 S-RL primarily employs the technique of pruning to a lateral branch.

5.9.2.6 S-RL can be carried out at any time of year.

5.9.3 Perimeter reduction (S-RO)

5.9.3.1 S-RO is done in order to reduce the risk of windthrow, trunk fracture or crown disintegration in trees with disrupted stability and **primary crowns**.

5.9.3.2 S-RO is carried out particularly in the top third of the crown in order to reduce the strained surface of the crown and lower the tree's centre of gravity. Branches in the top part of the crown are reduced the most; the reduction length decreases downwards (Annex 3, Fig. 5).

5.9.3.3 Each intervention should not remove more than 30% of the assimilation organs.

5.9.3.4 S-RO implementation has to consider the species properties, vitality, shading by neighbouring individuals, etc.

5.9.3.5 If possible the pruning should not alter the crown shape desirable and typical of the species or cultivar.

5.9.3.6 S-RO cannot be done on young and middle-aged trees in the dynamic length increment stage; it is intended primarily for adult and senescent (old and biologically valuable) trees.

5.9.3.7 S-RO is done ideally outside the growing season, preferably in its latter half.

5.9.4 Secondary crown stabilisation (S-SSK)

5.9.4.1 This concerns necessary removal of an overgrown **secondary tree crown** in order to assure its stability. S-SSK consists in a radical perimeter reduction of overgrown secondary shoots using the technique of pruning to a lateral branch or "blind" pruning (see Annex 3, Fig. 6).

5.9.4.2 It is carried out mainly on individuals whose primary crown was reduced radically in the past (by pruning or natural phenomena) without adequate follow-up management.

5.9.5 Removal pruning (S-RS)

5.9.5.1 Removal pruning refers to a deep reduction to the primary crown down to the main branches or to the trunk. The intervention is destructive for the tree, resulting in a worsening of its health condition.

5.9.5.2 S-RS is only possible in cases of danger of structural tree failure, if there is a justified interest in retaining it. It can only be done in **large-crowned poplars and willows**.

5.9.5.3 S-RS has to be carried out during periods of vegetative rest. The exception is urgent solutions to critical tree condition (for example, after a gale).

5.9.6 Shaping pruning (S-RT)

5.9.6.1 These pruning methods are used as part of juvenile pruning or after achievement of desired height and repeated at short intervals throughout the tree's life. The objective of shaping pruning is to maintain the tree crown in the desired shape by repeated prunes implemented at frequent periodic intervals.

5.9.6.3 The shaping pruning technique employed is removal of leader shoots or pruning to base. Blind pruning is the basic technique when forming hedges and tree walls.

5.9.6.4 It is done on woody plants with good crown and trunk regeneration (such as the common hornbeam – *Carpinus betulus*, European beech – *Fagus sylvatica*, linden genus – *Tilia* spp., etc.).

5.9.6.5 It is done outside the growing season, ideally just before leaf sprouting.

5.9.7 Pruning of fruit trees

5.9.7.1 Pruning of fruit woody plants is done in accordance with SPPK C02 005 – Management of functional plantings of fruit woody plants.

6. Other provisions

6.1 Construction work

6.1.1 All interventions in the root system within the tree crown projection area (see PNE 33 3301 and PNE 33 3302) have to respect SPPK A01 002 Tree protection during construction work.

6.2 Wood material handling

6.2.1 Wood material (branches and trunks) removed as part of tree pruning and felling **with a diameter under 70 mm, included**, is understood as loppings and logging leftovers.

6.2.2 Pursuant to Section 25, Para. 5 of Act no. 458/2000 Coll., loppings and logging leftovers are disposed of by their originator at their own expense, unless they agree otherwise with the owner.

6.2.3 Wood material (branches and trunks) **with a diameter above 70 mm** is understood as production wood material, which is the property of the tree owner. The material is left on the site by agreement with the land owner.

Annex 1 Protective zones and safety distances between woody plants and public technical infrastructure

Equipment type	Equipment	Specifications	Prot. zone	Measured from	1 m	Bans/restrictions	Exemptions	Restriction type	Ref.
Power grid equipment	Overhead lines	for voltage from 1 kV (low voltage 400/230				Outer conductor			
		for voltage from 1 kV to 35 kV inclusive	conductors without insulation	7 m		Outer conductor	Vegetation growing above 3 m is prohibited.	Protective zone (established on the day of legal force of the zoning decision or zoning approval; if the Building Act requires neither of the above, then the day of commissioning of the power grid equipment).	Section 46 of Act no.458/2000 Coll.
			conductors with basic insulation	2 m					
			suspended cable lines	1 m					
		for voltage from 35 kV to 110 kV inclusive	conductors without insulation	12 m					
			conductors with basic insulation	5 m					
		for voltage from 110 kV to 220 kV inclusive		15 m					
		for voltage from 220 kV to 400 kV inclusive		20 m					
		for voltage above 400 kV		30 m					
		for suspended cable lines 110 kV		2 m					
		for licence holder's own telecommunication network equipment		1 m					
	Underground lines, control and security equipment lines		for voltage from 1 kV (low voltage 400/230 V)	1 m		Outer cable	Planting permanent vegetation and crossing with machinery of total weight above 6 t is prohibited.		
			for voltage up to 110 kV	1 m					
			for voltage above 110 kV	3 m					

Equipment type	Equipment	Specifications	Prot. zone	Measured from	Bans/restrictions	Exemptions	Restriction type	Ref.
Power grid equipment	Power substation	Outdoor	20 m	Fencing or outer face of outer wall	Vegetation growing above 3 m is prohibited.		Protective zone (established on the day of legal force of the zoning decision or zoning approval; if the Building Act requires neither of the above, then the day of commissioning of the power grid equipment).	Section 46 of Act no. 458/2000 Coll.
		Substations with more than 52 kV in buildings	20 m					
		Mast and tower substations with outdoor supply line and voltage conversion from above 1 kV and below 52 kV to low voltage	7 m	Outer edge of substation footprint in all directions				
		Compact and walled with voltage conversion from above 1 kV and below 52 kV to low voltage	2 m	Outer face of substation in all directions				
		Integrated	1 m	Walling				
	Power generating plant		20 m	Outer face of outer envelope				
Gas equipment *	Low-presure and medium-pressure gas connections in built-up municipal areas		1 m	Equipment footprint	Planting permanent vegetation rooting lower than 200 mm above the gas pipeline in a free strip of land 2 m wide on both sides of the line or connection axis is prohibited.	Approval of transport system, distribution system, gas reservoir or connection operator.	Protective zone (established on the day of legal force of the zoning decision or zoning approval; if the Building Act requires neither of the above, then the day of commissioning of the power grid equipment).	Section 68 of Act no. 458/2000 Coll.
	Other gas pipelines and connections		4 m					
	Process buildings		4 m					

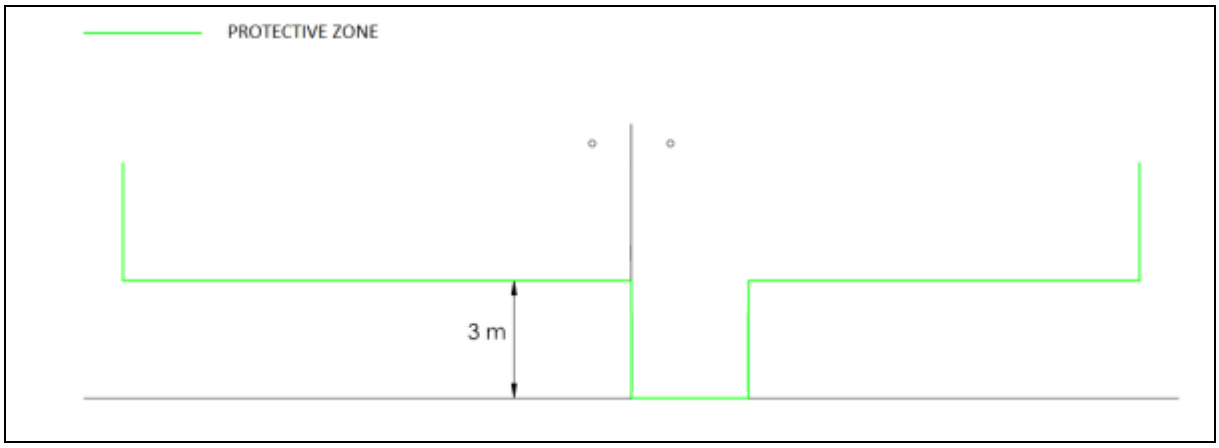
Equipment type	Equipment	Specifications	Prot. zone	Measured from	Bans/restrictions	Exemptions	Restriction type	Ref.
Heat production or distibution equipment			2.5 m	Equipment (footprint) circumference	Planting permanent vegetation is prohibited	Written approval of equipment operator	Protective zone (established on the day of legal force of the zoning decision or zoning approval; if the Building Act requires neither of the above, then the day of commissioning of the power grid or heating system equipment).	Section 87 of Act no. 458/2000 Coll.
Communication lines	Communication lines	Overhead	as per the zoning, protected area or protective zone decision				Protective zone (established on the day of legal force of the zoning decision, protected area or protective zone decision)	Sections 102 and 103 of Act no. 127/2005 Coll., Act no. 183/2006 Coll.
		Underground	1.5 m	Outer line	Planting permanent vegetation is prohibited	Owner's approval	Protective zone (established on the day of legal force of the zoning decision)	
	Radio equipment and radio directional lines		as per the protected area or protective zone decision				Protective zone (established on the day of legal force of the protected area or protective zone decision)	

Developed based on:

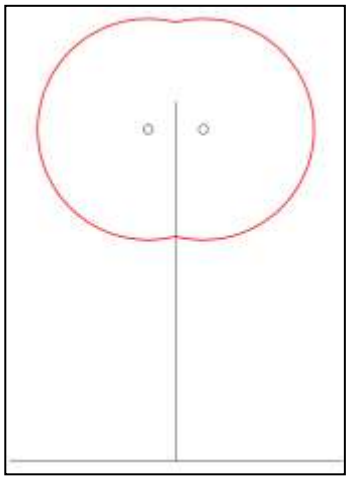
Act no. 458/2000 Coll. on Requirements for Business and Public Administration in Energy Industries and on amendment of certain acts (Energy Act), as amended
Act no. 127/2005 Coll. on Electronic Communications and on amendment of certain acts (Electronic Communications Act), as amended
Act no. 183/2006 Coll. on Spatial Planning and Building Rules (Building Act), as amended
Power industry standard for electricity distribution PNE 33 0000-6.

* Generally, activity that may pose a threat to gas facilities, their reliability and operating safety are prohibited in the protective zone. (Section 68, Para. 3 of Act no. 458/2000 Coll.)

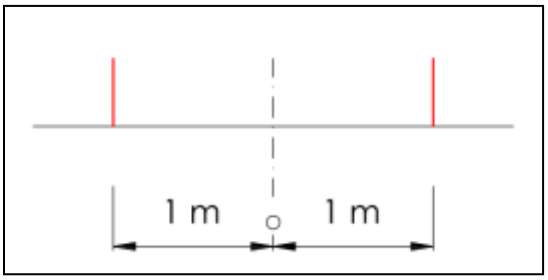
Annex 2 Protective zones and safety distances between woody plants and public technical infrastructure – model examples



A. Model example of outdoor HV and VHV (overhead) lines.



B. Model example of safety distance from LV overhead lines.



C. Model example of protective zones of LV, HV and VHV underground cable

Developed based on:
Power industry standard for electricity distribution PNE 33 0000-6.

Annex 3 Illustrations

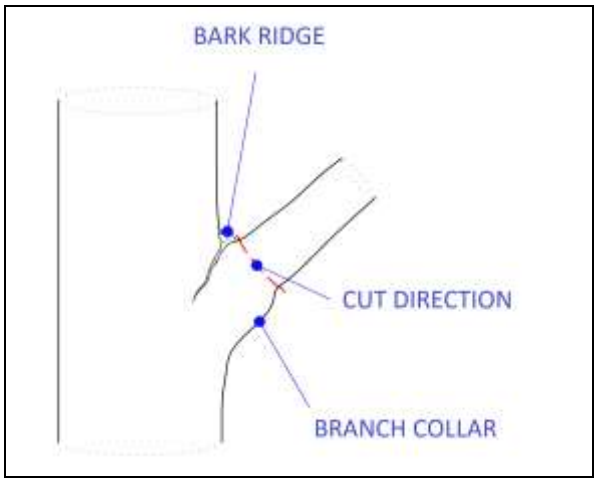


Fig. 1 Pruning to branch collar (5.5.1).

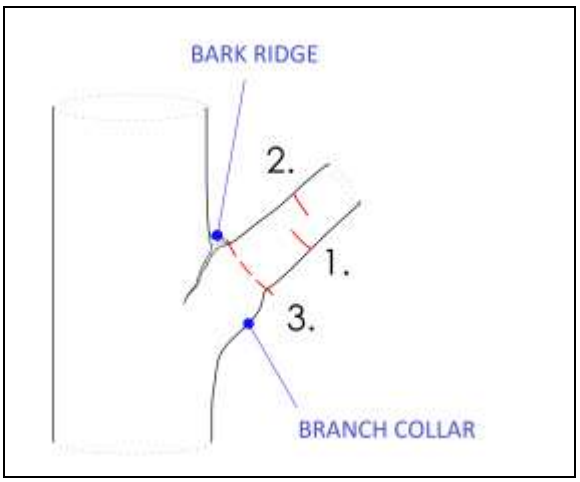


Fig. 2 Pruning in three goes (5.5.3).

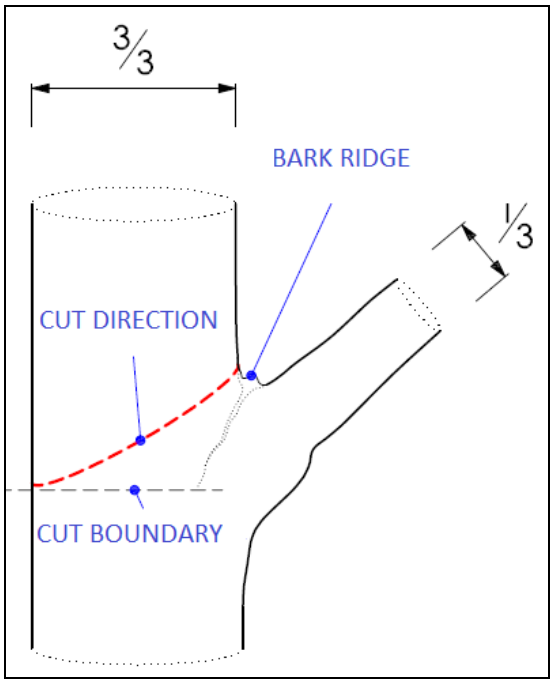


Fig. 3 One-third rule (5.6.3, 5.6.4).

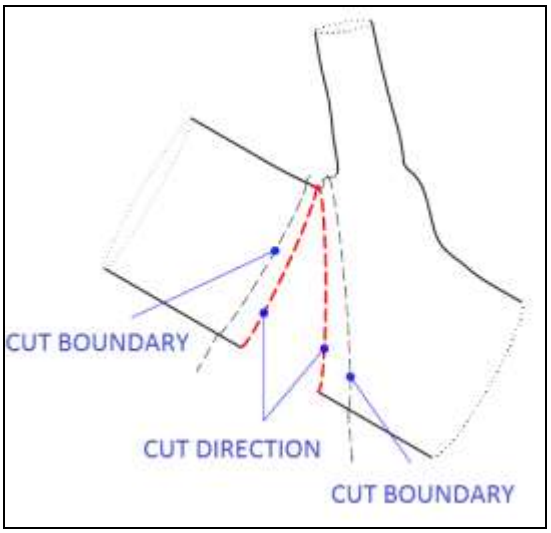
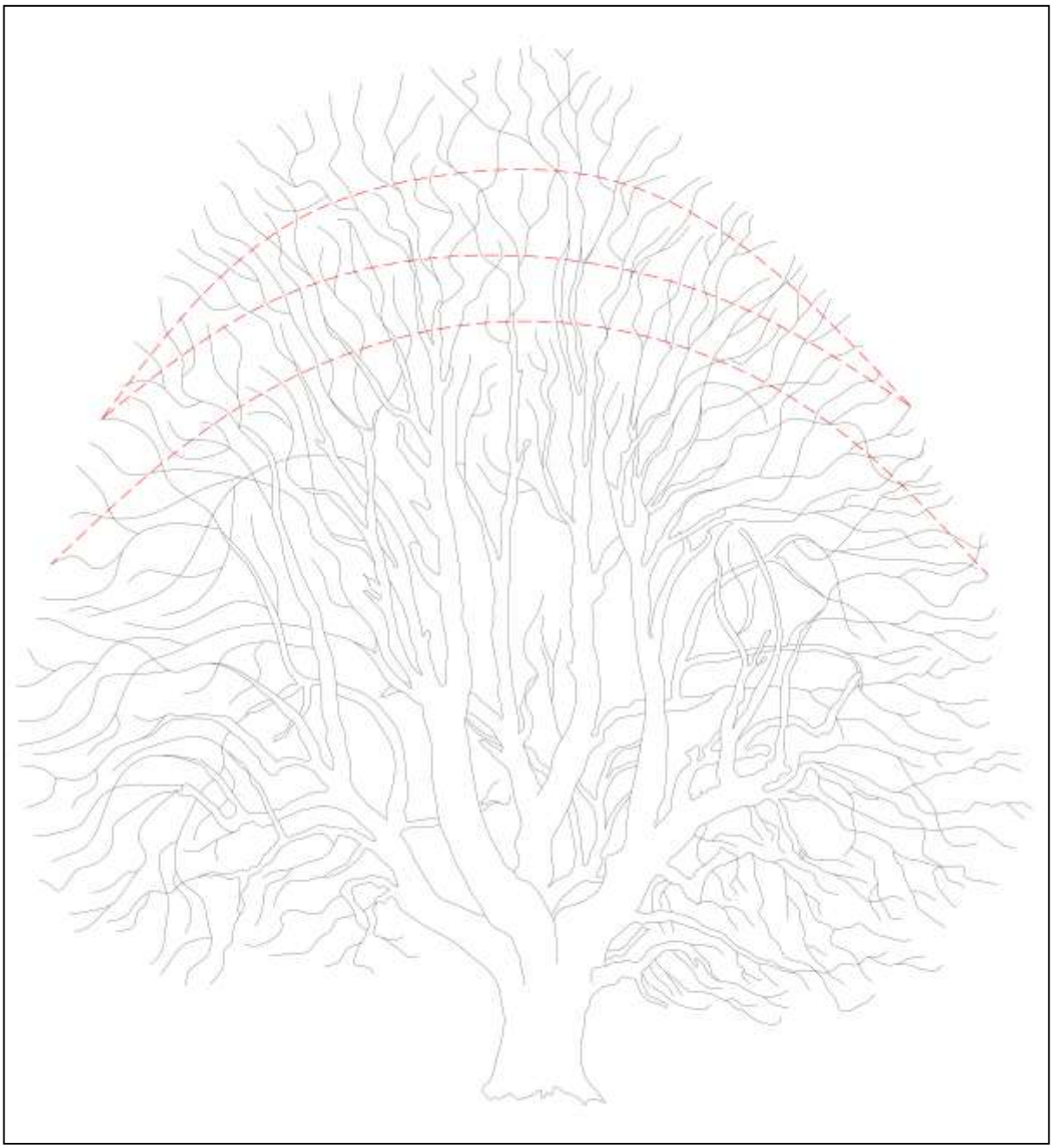
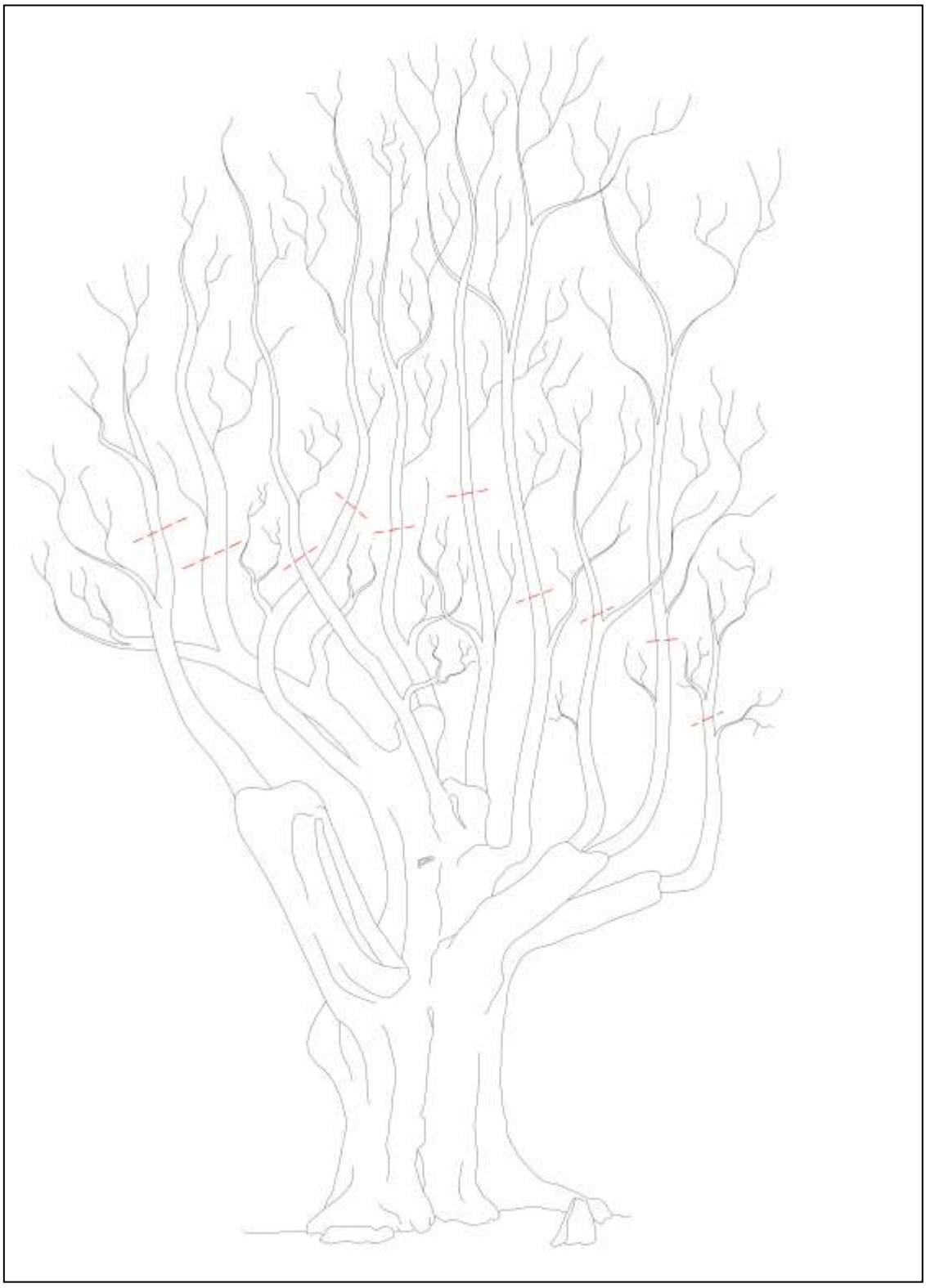


Fig. 4 Pruning to side branch (5.5.4).





Annex 4 List of Nature and Landscape Management Standards developed (Arborist Standards)

01 Inspection, assessment, planning

01 001	Tree assessment
01 002	Protection of woody plants during development activities

02 Work procedures

02 001	Planting of trees
02 002	Pruning of trees
02 003	Planting and pruning of shrubs and climbing plants
02 004	Safety bonds and other stabilisation systems
02 005	Cutting of trees
02 006	Protection of trees against lightning strike
02 007	Modification of woody plant site conditions
02 008	Woody plant stand establishment and management
02 009	Special interventions in trees
02 010	Management of woody plants along public transport infrastructures
02 011	Care of woody plants along utility lines

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