Ministry of Forests and Range

Forests for Tomorrow

Planting Standards
for Ministry funded Programs
Effective March 15, 2010

These standards apply, in addition to the General Standards for Ministry funded Programs (FS 1001), and to all planting activities funded under Ministry funded Programs.

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ARTICLE 1: DEFINITIONS

1.1 In this document, the following words shall have the following meanings:

"Acceptable Microsite" means a Microsite that meets the requirements specified herein.

"Acceptable Existing Tree" means a natural tree or a previously planted tree that meets the specified criteria as to species, size, and quality, and that is to be treated the same as a planted tree.

"Approved Planting Quality Inspection System" means the Ministry of Forests and Range's current FS 704 Planting Quality Inspection System http://www.for.gov.bc.ca/isb/forms/lib/FS704A.PDF in effect immediately prior to the commencement of Work **or** another similar system approved in writing by the Ministry Representative prior to the commencement of Work.

"Microsite" means a portion of a site that is uniform in microtopography and surface soil materials, generally ranging in size from less than 1 m^2 to occasionally over 5 m^2.

"Minimum Inter-tree Distance" means the specified minimum distance that must be maintained between planted trees and between a planted tree and an Acceptable Existing Tree.

"Ministry Representative:" means

(a) a person appointed as a Ministry Representative pursuant to the Recipient Agreement,

(b) a person who is authorized through an implementation contract to act on behalf of the Ministry Representative for purposes of these Planting Standards, or

(c) a Ministry of Forests and Range employee who is appointed to act as the Ministry Representative for purposes of these Planting Standards.

The person who will be the Ministry Representative for purposes of these Planting Standards must be identified to the Recipient prior to the commencement of Work.

"Payment Unit" means a planted area for which a planting payment certificate is created. Payment Units can be specified in the planting contract and may be further refined by the Recipient to address

operational situations. The Ministry Representative can also create a separate Payment Unit as described in section 4.9.

"Planting Spot" or **"Plantable Spot"** means a plantable area of ground that is both an Acceptable Microsite and meets the spacing requirements.

"Target Inter-tree Distance" means the specified desired distance to be maintained between planted trees or between a planted tree and an Acceptable Existing Tree.

ARTICLE 2: SEEDLING STANDARDS

Suitability of Seedlings

2.1 Seedlings planted on a Work Area must:

(a) meet the seedling specifications in a Treatment Plan or Work Plan for the Work Area;

(b) subject to section 2.2a unless otherwise approved by the Ministry Representative, be consistent with the seed transfer limits specified in the Chief Forester's Standards for Seed Use; and

(c) if purchased by the Recipient, meet the Ministry Seedling Stock Specifications in effect at the time of sowing for that type of seedling, unless otherwise approved by an appropriate Ministry Officer.

2.2 Seedlings which are mouldy, dry, flushed, frozen, damaged or otherwise unhealthy must not be planted without written approval from the Ministry Representative.

2.2a Section 8.8 of the Chief Forester's Standards for Seed Use does not apply to a Recipient. Instead, the Recipient must ensure that 95% of the combined total of the number of seedlings planted in a management unit (TSA), during each fiscal year under the Recipient Agreement, comply with the transfer requirements specified in sections 8.2 to 8.7 of the Chief Forester's Standards for Seed Use.

Care of Seedlings

2.3 Seedling thawing must be carefully timed so that there is a minimum of delay between thawing completion and when the seedlings are planted. If there are delays between thawing completion and planting, the thawed seedlings must be stored under conditions that prevent freezing, excessive heating, diminished seedling vigour, seedling flushing or excessive Botrytis development.

2.4 If seedlings can not be planted within 14 days of thawing completion the Recipient shall promptly notify the Ministry Representative.

2.5 Seedlings must be stored or transported in a manner that prevents physical damage to the seedlings, excessive heating, significantly diminished seedling vigour, flushing, excessive Botrytis development or increased seedling mortality.

2.6 Unless otherwise specified by the Ministry Representative, boxes of seedlings stored on or near Work Areas without refrigeration must:

(a) have inside seedling box temperatures maintained at as low a temperature as possible by establishing field caches in as shady a location as is conveniently available,

(b) be covered by a reflective tarp that provides protection from sun and precipitation and permits air circulation around each box, and

(c) be stored on the Work Area for as short a time period as practicable before they are planted.

2.7 Unless otherwise specified by the Ministry Representative, when summer or hot lifted seedlings are delivered to a field cache, the cartons must be opened and bundles placed upright in locations where indirect light is available under suspended reflective tarps. Such stock must not be kept in closed reefers, except during transport.

2.8 Hot lifted seedlings must be

(a) planted within 5 days after delivery, unless otherwise authorized by the Ministry Representative, and

(b) watered as necessary to keep the seedling roots moist.

2.9 If the Recipient fails to store, thaw, transport, handle or care for seedlings in the manner specified herein or has by any other means put the health, vigour, or safety of the seedlings in jeopardy, the Ministry Representative may reduce the Recipient's cost claim by

(a) fifty dollars ($50) for each occurrence involving a box of seedlings or less,

(b) two hundred fifty dollars ($250) for each occurrence involving more than one box of seedlings, or

(c) an amount that doesn't exceed the cost of the seedlings (including seed, nursery cost, cold storage and transportation), for each occurrence involving more than one box of seedlings, where the condition of the seedlings has deteriorated to the point that the seedlings are not worth planting.

Seedling Containers

2.10 All empty seedling containers and any associated garbage must be recycled if practicable, deposited in a landfill or disposed of in a manner agreed to by the Ministry Representative.

2.11 Despite the general requirements for site clean up in the Recipient Agreement, if empty seedling containers and associated garbage are not disposed of as described in Section 2.10, the Ministry Representative may reduce the Recipient's cost claim by an amount equal to the Ministry's cost to clean up and dispose of the empty seedling containers and any associated garbage.

ARTICLE 3: PLANTING STANDARDS

General Requirements

3.1 All planting must be in accordance with the FFT Standards, including any standards or specifications stated or implied in the Approved Planting Quality Inspection System which forms part of this Standard.

3.2 Despite any requirement that is specified on a per hectare basis, all specified spacing and density requirements must be met throughout the entire Work Area, so that planted trees are as well distributed as possible.

3.3 Where there are insufficient seedlings to plant an entire Work Area the area that is planted should be a logical, contiguous unit that is 'squared off' with simple boundaries that are flagged and mapped.

Work Plans

3.4 Where any of the following is not specified in a Treatment Plan it must be specified by Treatment Unit in a Work Plan:

(a) the species and seedling stock types to be planted including preferred species mixes ;

(b) the characteristics of an Acceptable Existing Tree, including species, size and quality characteristics;

(c) the criteria for selecting the best Acceptable Existing Tree when there is more than one candidate;

(d) the characteristics of an Acceptable Microsite (with potential variation by tree species);

(e) specifications for the type and placement of fertilizer, if any;

(f) the minimum density per hectare for planted trees;

(g) Minimum and Target Inter-tree Distance; and

(h) plot size, together with the maximum allowable Plantable Spots per plot in a planting inspection.

Acceptable Microsites

3.5 Acceptable Microsites are:

(a) areas that will maximize the growth and survival of planted seedlings (e.g. obstacle planting); and

(b) those Microsites specified in a Treatment Plan or Work Plan.

3.6 Unless otherwise specified, unacceptable Microsites are:

(a) stumps and poorly decomposed rotten logs;

(b) flooded areas or the bottom of depressions or gullies subject to flooding;

(c) cutbanks, roadside fill, raised humps or loose soil, gravel or debris subject to drought;
(d) any area within two metres of the running surface of major access roads;
(e) any area within the crown line of larger trees; or
(f) any area under overhead obstacles that could interfere with seedling growth.

Planting Spot Selection

3.7 Planting Spots must be selected and seedlings planted so that:
(a) the best available Acceptable Microsites are chosen;
(b) the best Acceptable Existing Trees are chosen;
(c) to the extent sufficient Acceptable Microsites are available, the Specified maximum number of Plantable Spots in a plot are planted as close as possible to the Target Inter-tree Distance and not closer than the Minimum Inter-tree Distance;
(d) the minimum acceptable density for planted trees per hectare is achieved; and
(e) the planting of Excess trees as defined in the Approved Planting Quality Inspection System is minimized.

Planting Spot Preparation

3.8 Planting Spots must be prepared so as to allow the seedling roots to be entirely planted in acceptable medium and the seedling shoot to be left free of debris.

Planting Techniques

3.9 The planting techniques used will be chosen to permit maximum survival and growth of the seedling.

3.10 Each seedling must be planted as follows.
(a) The planting hole must be deep enough and wide enough so that the entire root system may be fully accommodated in a natural position.
(b) The root systems must be positioned in the planting hole in a natural arrangement and must not be jammed, bent, twisted or otherwise distorted or damaged.
(c) The seedling must be planted so that the roots and stem are aligned along a vertical axis.
(d) The seedling must be planted to a depth such that after filling and tamping the root collar must be at or below the surface of the acceptable planting medium with no branches or needles buried.
(e) The planting hole must be filled with acceptable planting medium leaving no air channels or air pockets and firmly tamped so that the seedling will not pull loose with a gentle tug.
(f) Fertilizer, if any, must be placed in a location and manner so as to not risk damage to the seedling.

Handling of Seedlings During Planting

3.11 To prevent stress or damage to seedlings during planting:
(a) seedlings must not be root or top pruned;
(b) seedlings must not be damaged from scarring, bending, crushing, root stripping or other causes during handling or planting;
(c) planting bags must be of a type designed for the seedlings being planted and in good condition;
(d) seedling roots must be kept moist while inside planting bags;
(e) the number of seedlings in planting bags must not exceed that which can be carried and removed without injury to the seedlings, or which can be planted before critical heating or drying occurs;
(f) seedlings must only be removed from the protection of the bag one at a time and immediately prior to planting; and
(g) where "plug" type seedlings are being planted, plastic wrap must not be removed from bundles until immediately before the seedlings are needed for planting.

ARTICLE 4: INSPECTION & NOTIFICATION

Planting Quality Inspection

4.1 All Work must be inspected by a person (the "Inspector") who is:

(a) the Registered Professional Forester (RPF), or operates under the direction of the RPF, who will sign and professionally seal reports for the Work;

(b) experienced and competent in conducting inspections of planting operations;

(c) familiar with the Treatment Plans and Work Plans for the Work Areas; and

(d) not engaged in the direct conduct of the planting operations.

An Inspector must inspect the Work, in a timely manner, in accordance with the Approved Planting Quality Inspection System to ensure all Work is performed to the FFT Standards.

4.2 To avoid disputes, the critical parameters that affect the inspection of planting quality need to be documented by the Recipient and agreed to by the Ministry Representative before the planting contract begins. Critical parameters include all things that are not adequately described in the instructions for completing FS 704 plots (e.g. any screefing requirements, target and minimum inter-tree distance, the species, size and characteristics of acceptable existing trees; unacceptable Microsites, unacceptable soil medium; how to space away from live and dead overstorey trees during under planting; etc.).

4.3 Inspections must be based on a systematic sampling methodology with one plot per hectare usually being established. The number of plots on any one Payment Unit must never be less than twenty (20). Small planting units with similar prescriptions may be combined into a single Payment Unit if the number of plots per hectare exceeds four (4).

4.4 Quality inspection plots must be marked in the field and recorded on a survey map such that the plot center, plot number and inspectors initials can be located and identified for a period of up to three months after their establishment or until they may be covered for an extended period by snow, whichever is sooner. Plot centres must be marked with ribbon on the ground with ribbon indicating the plot number hung approximately 1.3 meters above ground, near the plot centre.

4.5 Each plot must be assessed for the number of seedlings planted, number of plantable spots and the acceptable inter-tree distance for planted trees. Each individual planted tree in the assessment plot must be assessed for damage, planting spot selection, and planting quality as described in the approved planting quality inspection system.

Wastage of Trees

4.6 Unless waived by the Ministry Representative, seedlings must be deemed wasted or unaccounted for when the number of seedlings planted in a Payment Unit, as measured using an Approved Planting Quality Inspection System, plus 10 percent (or the standard error of the estimate, whichever is greater) is less than the number of trees the planting contractor has claimed to have planted in the Payment Unit.

Determination of Satisfactory Treatment

4.7 A Payment Unit may be considered satisfactorily treated when:

(a) the average performance quality of all plots is 85% or higher;

(b) the number of seedlings planted per hectare meets or exceeds the specified minimum density requirement; and

(c) unless otherwise approved by the Ministry Representative, there is no contiguous area greater than one (1) hectare that does not meet the performance quality and density requirements.

4.8 Payment for planting must be based on the following standard Ministry of Forests and Range's payment percentage formula which decreases payment with decreasing performance quality below 92% (FS 767a).

$$\text{Payment\%} = (\text{PQ\%} \times 1.08) - \frac{[100-(\text{PQ\%} \times 1.08)]^2}{8}$$

Where PQ % is the calculated performance quality percentage.

The Recipient's cost claim should be based on the net payment to the planting contractor for each

Payment Unit, taking into account the payment percentage adjustment and any deductions for trees wasted or unaccounted for. Other standard planting contract charges (e.g. poor stock handling, excess trees, etc.) should be incorporated in Recipient's contracts with planting contractors and if incurred by the planting contractor should not be billed in the Recipient's cost claim.

4.9 If the Ministry Representative discovers a contiguous area greater than 2 hectares in size, that the Recipient has not addressed, where the average planting performance quality is below 85% or planting density is below the minimum required density, the Ministry Representative may treat the area with deficiencies as a separate Payment Unit for purposes of the Recipient's cost claim.

4.10 If, within an area the Recipient indicates has been planted the Ministry Representative finds a contiguous area exceeding one tenth (1/10) of a hectare of plantable ground, which has not been planted, the Ministry Representative may reduce the Recipient's cost claim by an amount equal to the product of the unplanted area (in hectares) multiplied by one thousand dollars ($1000.00) per hectare.

Requirement to Notify the Ministry Representative

4.11 Further to the notification requirements contained in the General Standards for Ministry Programs (FS 1001) a Recipient must promptly notify the Ministry Representative whenever:

(a) on any contiguous area greater than one (1) hectare planting quality is not satisfactory as defined in section 4.7 and, in the case of performance quality, the nature and extent of the errors are such that performance quality cannot be raised to at least 85%, or

(b) trees have been wasted, abandoned or stashed.

4.12 The Recipient must include with a notice of unsatisfactory performance a statement of the actions it has taken or will take to remedy the unsatisfactory performance.

Information the Ministry Representative may Request

4.13 Upon request from the Ministry Representative, the Recipient must provide the following information soon as possible:

(a) : a map or maps of an opening showing the area planted, where seedlots (or request keys) were planted, total trees planted by seedlot (or request key) and the planting quality check plot locations for any Payment Unit

(b) a copy of the planting quality check plots for any Payment Unit,

(c) a copy of the payment certificate for any Payment Unit indicating the total area planted and trees planted by seedlot (or request key) and any charges assessed against the planting contractor, and

(d) a summary of the total seedlings issued by request key for each planting contract and a breakdown of where these trees were planted by opening or Payment Unit.