Natural Resource Ministries

SCHEDULE C
Silviculture Survey Guidelines and Other Conditions

File: 10005-40/IM24TLH005

Attachment to the Agreement with _____ for **Summer Tree Planting Implementation – Various Locations – Cascadia Timber Supply Area.**

ARTICLE 1 DEFINITIONS

1.01 In this Schedule, the following words shall have the following meanings:

"Silvicultural Accredited Surveyor" means a person who is accredited through the Ministry of Forests, Forest Practices Branch as an Silvicultural Accredited Surveyor.

"Complete Survey Package" comprises all required deliverables specified in Article 7 of this schedule.

"Crew" means one person, or two or more persons working with each other in the same opening.

"Crop Tree Standards" means, in the absence of stocking standards, regional or district guidelines which define acceptable crop tree characteristics.

"Deliverables" means all field data forms, summary forms, reports, plans, assessments, maps or other forms and digital files which the Contractor is required to complete under this Agreement.

"Forest Stewardship Plan" means a plan as set out in the Forest and Range Practices Act.

"Multi-Storey Stand" means a stand being managed for single tree selection, where the crown closure of the trees in layer 1 and 2 is greater than or equal to six percent (6%) and where layers 3 and/or 4 are present.

"Opening" means a work area identified by an opening number.

"Prescription" means, as the context requires, a silviculture prescription, pre-harvest silviculture prescription, stand management prescription, or backlog silviculture prescription, specifying stocking standards, signed and sealed by a Qualified Forest Professional and approved by a licensee and a district manager, or a site plan specifying approved Stocking Standards, signed and sealed by a Qualified Forest Professional.

"Project Map or Treatment Map" means a map produced by the Contractor according to the specifications in this Agreement.

"Qualified Forest Professional" means a person registered and in good standing with the Association of BC Forest Professionals (ABCFP), having the required scope of practice, education, knowledge, expertise, and experience to practice the specific aspects of professional forestry set out in this Agreement.

"Silviculture Survey Procedures Manual" means the manual developed and produced by the Province as a reference for methodology, data collection, and compilation for silviculture surveys, as amended from time to time.

"Silviculture Treatment Recommendation" means a logical, biologically-sound, cost-effective recommendation, based on survey results and anticipated stand development, which specifies what if any, future surveys and/or treatments are required for a stratum, and which also specifies the year and season during which any such survey and/or treatment should take place.

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"Standards Unit" means one or more parts of the cutblock for which part or parts there is only one of each of the following: soil disturbance limits, regeneration date, stocking standard, free-growing date, free-growing height for each species that contribute to establishing a free-growing stand on the cutblock.

"Stocking Assessment Survey" means a silviculture survey where the intent of the survey is not to declare regeneration delay or free growing status, but rather to confirm that stocking levels are adequate throughout the opening, and to determine whether or not any future treatments will be necessary.

"Stocking Standards" means the site-specific legal requirements that are stated in the approved prescription, and any applicable standards to a silviculture survey contained in an approved "Forest Development Plan" or "Forest Stewardship Plan".

"Stratification Criteria" means the criteria set out in this Agreement, the Silviculture Survey Procedures Manual, and as specified by the Province.

"Stratum" means a Survey area for which the boundaries are determined by the stratification criteria specified in the Agreement for the type of survey referenced.

"Survey" means, as the context requires, a stocking, plantability, free-growing, reconnaissance or visual survey as those surveys are set out in the Silviculture Survey Procedures Manual and includes the collection and analysis of field data, and provision to the Province of all forms, maps, reports and silviculture treatment recommendations required by this Agreement.

1.02 If any of the words in the Agreement are used in this Schedule, they have the same meaning in this document unless the context dictates otherwise.

ARTICLE 2 GENERAL

2.01 The Ministry Representative will be Morgan Klassen, RFT, Operational Technologist.

2.02 The Contractor Representative will be _____.

Access

2.03 The Province is not responsible for the quality or type of access to any Work Area within this Contract. The Province is not liable for any access costs incurred by the Contractor.

ARTICLE 3 INFORMATION AND MATERIALS FURNISHED BY THE PROVINCE

3.01 The Province shall make available to the Contractor, as required and where available, the following resources, material, or property (the "Property") at no cost to the Contractor for the duration of the Agreement:

(a) prescriptions and associated amendment documents and maps applicable to the Work Area;

(b) Forest Development Plan (FDP) available upon request and/or Forest Stewardship Plan (FSP) (text, maps, and amendments) relevant to the Work Area – BCTS Cariboo-Chilcotin Business Area 2020 Forest Stewardship Plan https://www2.gov.bc.ca/gov/content/industry/forestry/bc-timber-sales/fsp/cariboo-chilcotin-fsp

(c) digital files containing Stocking Standards for all blocks and Standards Units applicable to the Work Area;

(d) forest cover maps and/or overview location map(s) showing block location(s);

(e) access to BC Timber Sales' block spatial files, in ESRI format, via the Ministry's FTP site;

(f) if the contractor decides to use SNAP; access to the BCTS SNAP application to facilitate data entry into LRM will be granted; this access is conditional upon receipt of proof that the Contractor holds a SNAP licence of their own that is valid for the duration of the project;

i. It is not mandatory for the Contractor to use SNAP or Survey Wizard to complete this project. Other survey software may be used to enter the Contractor's survey data into LRM; and

(g) sample survey reports.

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3.02 The Province retains ownership of the Property and hereby grants to the Contractor non-exclusive, non-transferable access to use the Property for the sole purpose of completing the Works required under this Agreement. The Contractor shall be solely responsible for any loss or damage to the Property and any costs required to repair or replace the Property to the satisfaction of the Province, excepting always loss or damage attributable to reasonable wear and tear.

3.03 The Contractor shall, at its own expense, return the Property to the Province immediately following the completion or termination of this Agreement.

ARTICLE 4 WORK PROGRESS PLAN AND MEETINGS

Work Progress Plan

4.01 A Work Progress Plan shall be developed prior to the commencement of the work, outlining the scope, timing, location and other requirements of the work. The Work Progress Plan will provide for the orderly completion of the work, and may be replaced and/or revised as planning evolves and conditions and priorities change.

4.02 Where the Ministry Representative requests the Contractor submit, as part of the Work Progress Plan, a map detailing the Contractor's proposed survey design for any opening, the Contractor shall have two (2) work days within which to comply with such requests, and the field work may not commence on the specified opening until the Ministry Representative gives written approval of the design.

4.03 Where the survey type has been identified in the Schedule B of this contract as a Regeneration Survey, the complete survey package must be submitted to the Ministry Representative no later than **fifteen (15) days prior to the expiry of the Regeneration Delay date** for that particular Unit as specified in the contract Work Progress Plan. Failure to do so could result in a financial penalty assessed to the Contractor in the amount of five hundred dollars ($500.00) for each occurrence.

Scheduled Meetings

4.04 A schedule for meetings between the Contractor and the Ministry Representative may be set out in the Work Progress Plan. Meetings may include topics such as work progress, production rates, quality of work, accomplishment of milestones, deliverables due, issues discovered during field work, schedule for remaining work, and any other discussion items related to the effective and satisfactory completion of the work.

4.05 The Contractor shall, at its own expense, attend all scheduled meetings. Failure of the Contractor to attend a scheduled meeting will be considered non-compliance with the Agreement.

4.06 Documentation of each meeting, including but not limited to meeting date, time, location, attendees, content of meeting, and outcomes of discussions will be kept by the Province. A copy of the documentation will be provided to each party.

ARTICLE 5 STANDARDS OF PERFORMANCE ALL SURVEYS

General

5.01 Satisfactory completion of the works will be measured against the standards set forth in the attached schedules and the completion dates for work set forth in the Work Progress Plan.

5.02 Unless otherwise specified, the Contractor shall conduct Surveys, develop Silviculture Treatment Recommendations, and complete reports in accordance with and to the standards set out in the following documents, as amended from time to time;

(a) the approved prescription for the opening;

(b) *Silviculture Survey Procedures Manual*, located at https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/silviculture-surveys

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(c) *Establishment to Free Growing Guidebook – Cariboo Forest Region*, located at https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/stocking-standards/efgg/efg-car-print.pdf

and its associated tables at**:**

(d) https://testwww.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/FREE/Cariboo-tables.pdf

(e) Forest Stewardship Pland (FSP) and supporting documentation - *BC Timber Sales Cariboo-Chilcotin Business Area 2020 Forest Stewardship Plan*, available upon request;

(f) Site Index by Site Series: Approximation located at https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/ecosystems/sibec-documents/sisubybgcunit2013.pdf

(g) District Policy (File 18760-00), Chilcotin & Central Cariboo Forest Districts: *Modified Free Growing Survey Criteria Within the SBPS xc and IDF dk4 Subzones of the Williams Lake TSA;*

(h) Silviculture Survey report template(s) – samples can be made available if required.

5.03 The Contractor represents and warrants that they are familiar with and understand the following documents, as amended from time to time. In relation to the works required under this Agreement, relevant documents include, but are not limited to:

(a) *Forest and Range Practices Act* and corresponding Regulations;

(b) *Forest Cover Stratification and Milestone Declaration V1.4,* August 14, 2007, located at https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/silviculture-results/stratification_and_milestone_regulation_examples_v1_4.pdf

(c) *RESULTS Information Submission Specifications – Form and Manner of Reporting - Licensee Submissions (Edition 3a)* located at 24TU https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/silviculture-results/infosubmissionspecsmar_2016_final.pdf

5.04 Where the Contractor determines a prescription is not suitable for an Opening, the Contractor shall provide recommendations for changes with rationale and map(s) where applicable to the Ministry Representative.

5.05 Contract schedules attached to the Operational and General Services contract may reference further documents not outlined above that are relevant to the performance of the work under this Agreement.

Identification of Strata

5.06 Unless otherwise specified in this schedule, the Contractor will stratify the Work Area(s) as set out in the Preliminary Stratification and Field Stratification sections of the *Silviculture Survey Procedures Manual*.

5.07 Minimum Stratum size will be as set out in the approved FSP. Where no minimum Stratum size is specified within an approved FSP, the minimum Stratum size will be as set out in the Forest Cover Stratification and Milestone Declaration https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/silviculture-surveys/forest_cover_stratification_and_milestone_declarations.pdf.

Required Documentation

5.08 Where the Province provides the Contractor with sample templates for work submissions, the sample will be the minimum acceptable standard for the deliverables produced by the Contractor.

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5.09 The Contractor shall record Survey information on the appropriate “Silviculture Survey” and “Silviculture Survey Plot” forms (FS657 and FS658). Where Survey data or results are summarized or represented using computerized or other electronic means, the display, content, and format of the information must substantially duplicate the corresponding Ministry forms (specifically the FS657, FS658, and FS659) and its respective procedural requirements, once approved by the Ministry Representative.

Marking Lines and Plots

5.10 As per the new BCTS Cariboo-Chilcotin Business Area requirements, plastic ribbon shall only be used when tied with a double knot at a minimum height of one point three metres (1.3 m). If trees need to be marked below one point three metres (1.3 m), the Contractor must use alternative means which may include chalk paint or biodegradable ribbon.

5.11 To assist the Ministry Representative in locating the plot centres, the Contractor shall:

(a) mark the Point of Commencement (POC) with flagging tape on which the Contractor shall write, in waterproof ink:

i. the POC number (as appropriate);

ii. the date of Survey;

iii. the licence, cutting permit, and block numbers, or Opening number;

iv. the type of Survey conducted; and

v. the direction and distance to the first plot.

(b) mark the baseline (if established) and all strip lines with flagging tape on which the Contractor shall write the baseline and stripline number (as appropriate) in waterproof ink. Where handheld global positioning system (GPS) units are used to determine Universal Transverse Mercator (UTM) coordinates of plot centre locations, marking of baseline(s) and strip line(s) is not required.

(c) when plots are established, mark the plot centres by affixing flagging tape at a height of approximately one point three metres (1.3 m) above each plot centre, on which the Contractor shall write in waterproof ink:

i. the plot number and strip line (if applicable);

ii. the surveyor’s initials; and

iii. the bearing and distance to next plot.

Damage and Condition (Forest Health) Assessment

5.12 For each Stratum, the Contractor shall examine the general health status within the Stratum, and record:

(a) the type of pest, disease, or damage present;

(b) the type of pest, disease, or damage; the severity of damage and the percent of total trees; percentage of total conifers and percent of the host trees affected including the percentage of the area of the Stratum affected;

(c) the type of pest, disease, or damage present by means of the “Standard Pest Identification Codes” specified on the “Damage Agent and Condition Code” reference form (FS 747);

(d) the pest, disease, or damage information in the appropriate column of the field data forms; and

(e) a summary of the pest, disease, and damage information in the Silviculture Treatment Recommendations and summary section of the FS659.

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Brush Hazard Assessment

5.13 Where required, the Contractor shall examine each Stratum for any brush hazard which may be present and record the general status of the brush hazard within the Stratum, including:

(a) the estimated percentage of brush cover;

(b) average brush height in centimetres;

(c) current brush severity using the following codes:

HIGH – brush currently is, and will continue to:

- significantly impact crop tree vigour, as evidenced by crop tree mortality, poor crop tree growth, and/or unacceptable crop tree form; or
- prevent the Stratum from achieving the free-growing Stocking Standards and requirements.

MED – brush is moderately impacting, or will increasingly affect:

- crop tree vigour, as evidenced by decreasing crop tree growth, or decreasing crop tree to brush height ratio; or,
- the Stratum's ability to achieve the free-growing Stocking Standards and requirements in the future;

LOW – brush is having little impact on crop tree vigour, is not likely to cause future impacts and is unlikely to prevent the Stratum from achieving free-growing Stocking Standards and requirements.

NIL – no brush hazard present.

(d) current brush distribution:

CONTINUOUS - brush covers large portions of the Stratum
PATCHY– brush covers small patches within the Stratum
SCATTERED – brush is randomly distributed in small clumps or individual plants; and

(e) the estimated incremental growth of competing vegetation, based on site productivity.

Photography

5.14 Unless otherwise specified in writing by the Ministry Representative, the Contractor shall provide to the Province at least one (1) colour digital photograph showing representative portions and overview of each Stratum of each Opening. Additionally, the Contractor shall provide to the Province at least one colour digital photograph showing a respresentative well-spaced crop tree for each Stratum of each Opening.

5.15 Notwithstanding other remedies available to it, where the Contractor fails to produce suitable photograph(s), the Province reserves the right to charge an assessment against payment equal to the estimated cost of obtaining such photograph(s).

Forest Cover Inventory Label and Silviculture Label

5.16 The Contractor shall, complete and submit a forest cover inventory label" and "silviculture label for each Stratum resulting from the Survey, as specified in the *Silviculture Survey Procedures Manual* and the *RESULTS Information Submission Specifications – Form and Manner of Reporting - Licensee Submissions (Edition 4)* located at 24TU https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/silviculture-results/infosubmissionspecsmar_2016_final.pdf via the approved information management system as directed by the Ministry Representative.

Project and Treatment Maps

5.17 The Contractor shall:

(a) prepare a Project Map to the following specifications for each Opening surveyed (the maps provided in the contract may be used as a "base map");

(b) prepare a Treatment Map to the following specifications for each Opening surveyed where future treatments are recommended based on the survey results;

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(c) unless otherwise specified in this Schedule draft the Project and Treatment Maps at a scale of 1:10,000 on legal-sized paper;

(d) ensure Project and Treatment Maps detail the following:

i. date of Survey;

ii. Opening number;

iii. licence, cutting permit, and block numbers;

iv. unique block identifier (UBI) number;

v. scale;

vi. legend identifying line types and symbols used on the map;

vii. Opening boundary;

viii. roads and landings;

ix. creeks and streams;

x. identification of each Stratum;

xi. identification of each Standards Unit ;

xii. aerial photograph tie points (if applicable);

xiii. access notes;

xiv. forest cover inventory label and silviculture label (including well-spaced and free growing trees per hectare) for each Stratum;

xv. North arrow; and

xvi. draught person's name and date of draughting.

5.18 ensure all Project and Treatment Maps submitted to the Province are originals, not photocopies;

5.19 ensure that, in addition to the requirements as outlined in 5.17 (d) of this Schedule, Project Maps also detail the following:

(a) point of commencement (POC);

(b) Survey lines with numbers and direction travelled;

(c) identification of each ecosystem site series;

(d) Opening and Stratum areas;

(e) photograph ground point location and direction of image; and

(f) type of Survey.

Allowable Errors in Measurement

5.20 The Contractor shall record Survey information accurately within the following allowable errors:

Item	Allowable Error
P.O.C.	± 10 metres
All bearings	± 2 degrees
All plot centres and tie points	± 2% of horizontal distance (HD)
Plot radius	± 1% of HD
Closed traverse	± 1% error of closure
Estimated tree heights: • under 2 metres • 2 metres to 10 metres • greater than 10 metres	 ±10 centimetres ±10 % ± 20%
Measured tree heights	± 5%

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Estimated tree diameters	± 20% (rounded to the nearest whole cm)
Estimated stand age	± 20%
Site index	± 3 metres (for Growth Intercept Method)
Stratum area in hectares	± 10%
Number of well-spaced trees, free growing trees	± 10%
Number of plantable spots, preparable spots	±10%
Number of total trees, total conifers, or countable conifers	± 20%
Forest health factors	± 10% absolute difference of incidence (e.g. 2% vs 12% of incidence)

ARTICLE 6 STANDARDS OF PERFORMANCE FOR SAMPLE PLOT SURVEYS - STOCKING AND PLANTABILITY SURVEYS

6.01 The following additional standards of performance shall apply where the Work requires the Contractor to conduct a sample plot Survey for stocking, or plantability.

Objectives

6.02 The objective of plot Surveys are:

(a) to determine the stocking levels existing within each Opening;

(b) to determine the number of plantable spots that exist within each Opening;

(c) to quantify stocking, and/or plantability levels for each Stratum within the Opening to accepted statistical requirements;

(d) to identify limiting factors that may prevent maintenance of appropriate stocking levels or achievement of required free-growing stocking levels;

(e) to delineate areas where further treatments may be necessary; and

(f) to recommend treatments necessary to maintain or achieve appropriate stocking and/or free growing levels.

Crop Tree Acceptability Criteria

6.03 All coniferous and deciduous trees will be tallied in the total tree count, including germinants. If initial tally exceeds 35 per 3.99 meter plot radius plot, this count can be an estimate. Total conifer count will be tallied for all conifers including germinants. **Germinant stems per hectare must be mentioned in the comments or manually entered into provided survey report field as well as a comment about the quality of these trees and their expectation for future ingress and development.**

6.04 Trees of preferred and acceptable species are eligible for selection as well-spaced crop trees if they are greater than ten centimetres (10 cm) in height for all species.

6.05 Where the Stocking Standards do not indicate a minimum inter-tree distance, the Contractor will use a minimum inter-tree distance of two meters (2 m).

Site Index Methodology

6.06 Site Index must be collected following the procedural hierarchy guidelines outlined in *Selecting a Method to Estimate Site Index 2006, Land Management Handbook, Field Guide Insert 12* unless otherwise specified by the Ministry Representative.

ARTICLE 7 TREE RETENTION (RESIDUALS AND RESERVES): SAMPLING AND REPORTING PROCEDURES

7.01 All surveys completed on stands with some kind of treed retention, in the form of long term residuals (reserves for the entire rotational planning cycle) or short term residuals (available for subsequent harvest removals prior to the end of the rotational planning cycle) shall be surveyed and reported in accordance with the Forest Practices Branch document entitled *Submitting*

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Forest Cover to Results for Openings with Treed Retention, as amended from time to time, and available online at the following location:

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/silviculture-results/forest_cover_retention_submissions_may_5_2016_final.pdf

7.02 ***Retention and Residuals*** refer to trees remaining, either singly or in groups, after a bounded Net Area to be reforested (NAR) area has been subject to *stand disturbance*. The general term "*retention*" meaning trees retained in a cutblock is distinguished from the more specific term "*retention system*" which refers to a specific silviculture system in BC with specific stand characteristics.

7.03 These guidelines pertain to residuals with a diameter at breast height (DBH) of, or exceeding, twelve point five centimetres (12.5 cm), unless otherwise stated in an official plan or prescription.

7.04 ***Long term residuals*** retained for an entire rotational planning cycle are referred to as "***reserves***". Reserves are understood to be not available for harvesting until the next rotational cycle for the stand.

7.05 ***Short term residuals*** *intended* to be retained (whether or not they are eventually harvested in another harvest entry) for a portion of a current rotational planning cycle, are referred to as "residuals" or "retention" or other terminology that conveys standing trees. They are not referred to as "reserves".

7.06 When Article 7 applies to a strata, inventory information must be submitted as per the *TCC SURVEY DATA STANDARDS*.

ARTICLE 8 MULTI-STORIED, LAYERED SURVEYS AND DEVIATION FROM POTENTIAL

8.01 The age of layer one (1) and layer two (2) trees must be determined with an increment bore. Sample trees shall be bored at one point three metres (1.3 m) above ground on the high side of the tree, and ages shall be corrected as per Appendix 7 of the *Silviculture Survey Procedures Manual.*

8.02 Statistics are not required for multi-story surveys.

8.03 The Contractor shall not change to multi-storied stocking standards from the (**even-aged)** single layered standards which have been identified in the Prescription. Instead the Contractor shall collect survey data and submit a summary for the stratum as a **layered survey**. Please refer to the *Silviculture Survey Procedures Manual.)* If the opening is being managed as an even-aged but has multi-storied stocking standards in the prescription, the surveyor shall recommend an amendment to the standard to convert to even aged Standards and then survey to that standard.

8.04 If the Contractor recommends a change to multi-storied stocking standards from the single layer standards which have been identified in the Prescription, the Contractor shall collect survey data and submit a summary for the stratum as both multi-storied and single-layered. If the statistical analysis for the single-layered data indicates that the mean of the well-spaced or free growing data is greater (>) than the MSS, but the LCL is less than (<) the MSS, then (1.5 plots/ha shall be completed to meet statistical requirements. This procedure allows BCTS to determine the best management approach for the stand, and provides the statistical data to backup decisions and complete legal reporting obligations. Refer to Article 15 (b) for additional details about payment to be issued to the Contractor under these circumstances. Note that a layered stand is not multi-storied unless it is intended to be managed as an uneven-aged stand in the future. A layered stand should be surveyed using a layered survey and not a multi-storied survey (see 9.2.2 in the Survey Manual).

8.05 Where the result of a survey would benefit from a Deviation from Potential survey the contractor must state this in their comments. Where a Regeneration or Stocking Assessment Survey is planned in the Schedule B, and the Contractor is requested to complete a DFP survey, **it must be done where it is consistent with the BCTS – Cariboo-Chilcotin Forest Stewardship Plan.**

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ARTICLE 9 MAXIMUM DENSITY, COUNTABLE CONIFERS, AND COUNTABLE HEIGHTS

9.01 Countable heights used for determining countable conifers must be recorded at each plot and submitted with the plot data for all strata that exceed or approach the maximum allowable density.

9.02 Where the number of countable conifers per hectare is well below the maximum allowable density, countable conifers do not need to be tallied. More specifically, countable conifer information will not be required where:

(a) The total conifer density is less than (<) 20,000 stems per hectare and the maximum allowable density is 25,000 countable conifers per hectare;

(b) The total conifer density is less than (<) 8,000 stems per hectare and the maximum allowable density is 10,000 countable conifers per hectare.

9.03 When determining the median height of the well-spaced trees in the plot for the purpose of calculating the countable height, the Contractor shall only consider the tallest trees in the plot up to the M value. For example, if there are eight (8) total well-spaced stems in the plot and the M-value is six (6), the surveyor shall determine the median height by considering only the six (6) tallest well-spaced stems in the plot. In this example, the median height would be calculated by measuring the heights of the third and fourth tallest well-spaced trees in the plot, and then determining the average of these two numbers (2), to give the median height.

ARTICLE 10 WELL-SPACED AND FREE GROWING TREES

10.01 The Contractor must record the total number of well-spaced trees, including those trees beyond the M-value.

10.02 Tree marking procedures – when trees are to be marked with ribbon or paint. Do not tie ribbons to leaders and do not paint any leaders.

(a) When completing a regeneration or stocking assessment survey, only the well-spaced trees need to be marked in the field.

10.03 The marking of trees must follow the same specifications as in Clause 5.10 of this Schedule.

ARTICLE 11 PLANTING DENSITY, PLANTABLE AND PREPARABLE SPOTS, AND EXPECTED SURVIVAL RATES

11.01 The Contractor shall identify the Target Stocking Standard (TSS) specified in the Prescription and use the information provided in the table below to determine the target planting density and target inter-tree spacing to be used to assess plantable spots:

Target Stocking from the Prescription	Target Planting Density (sph)	Maximum # of Plantable Spots per 3.99 m radius plot	Target Inter-tree Spacing (m)
1000	1600	8	2.7
1200	1800	9	2.5
Where higher than normal mortality is anticipated due to cattle, brush, or other factors, use a target planting density of 2000 sph	2000	10	2.4

11.02 Plantable spots are to be assessed using the target inter-tree distance from the above table, and not the minimum inter-tree distance specified in the stocking standards of the Prescription. On occasion, a

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plantable spot can be assessed closer to the minimum inter-tree spacing to select a better microsite, but in these cases, the Contractor shall include a comment in the plot as rationale.

ARTICLE 12 REPORTS AND DELIVERABLES

12.01 By the deadlines identified in the Work Progress Plan, the Contractor shall deliver to the Province all Deliverables set out in the Agreement.

12.02 The Contractor shall prepare, in accordance with the requirements set out in the Agreement, and provide to the Province for each Opening the following:

Stocking, Regen, and Plantability Survey List of Deliverables	# of Originals	Digital Deliverable Format
All original field data and summary forms	1	Not required
Project Map	1	.pdf
Survey Report, signed and sealed by Qualified Forest Professional	1	.pdf
Colour photograph for each Stratum	1	.pdf
Recommendations for amendment to Prescriptions, as applicable, with rationale and map(s)	1 (may be incorporated into Survey Report)	.pdf
Digital Survey attribute data in a format suitable for upload into LRM	N/A	ASCII flat file, comma delineated file, or survey software output file (e.g. .sw3, .csv, .mdb, etc)
Digital spatial information for strata and treatment areas in a format suitable for upload into LRM	N/A	Shapefile (.shp, .prj, .shx, .dbf)

12.03 One (1) original and one (1) electronic copy of all survey reports must be submitted, and the contents of the survey report must contain, as a minimum, information equivalent with that provided in the sample survey reports attached in the appendices section of this Agreement.

The report must include in the comments section; statements to the following within each survey:

1) Provide a block description, discuss the site conditions, do you agree with the BEC classification, and are the Stocking Standards appropriate.
2) If limiting factors are present on the site, for each factor or deficiency describe possible solutions.
3) For each stratum clearly describe any forest health issues observed. Describe the pest, disease, or damage and the risk it poses, and any treatment recommendations required.
4) Have the standards in the silviculture prescription, site plan or FSP been met, are any amendments recommended. Provide rationale if necessary.
5) Comment on the quality of germinates and their expectation for future ingress and development within the block.
6) Is a treatment required to meet the regeneration date, or to assure a free growing stand is achieved within the prescribed free growing time frame? Primary and alternate recommendations must be provided. Provide the estimated time to meet FG standards.
7) For each stratum comment on the brush hazard in the stated form of HIGH. MED, LOW, or NIL. Clearly describe why the brush severity code has been chosen, describe the species of brush, percent cover, and height of competing vegetation, expected future average growth per year, vigor and its overall impact on crop trees.

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8) If a brushing treatment is recommended within two (2) years then a Brushing Prescription form must be completed and submitted with the survey report. Possible brushing specifications could include statements such as "cut all aspen and alder; brushing of willow not necessary as it is not competing", "brush all competition within two (2) meters of crop trees", etc.
9) If a stratum would likely be considered as Regeneration Delay met as a result of a DFP (Deviation from Potential) survey then a recommendation to complete a DFP survey must be stated in the comments.
10) For all NSR burn piles located in a satisfactorily restocked portion of a block, make a comment in the report as to their total area within the block and number of plantable spots as well as their locations on the map which may be hand drawn and approximate.

Mapping Deliverables must include:

1) For each Unit, the Contractor shall submit a simple Project Map and Plot Map. The Plot Map can be a copy of the Project Map, and is used to identify strip lines and plot information. The Plot Map may be overlaid with the Project Map, providing that all the required Project Map information is visible.

2) Prior to commencing work, BC Timber Sales will provide the Contractor with a Planned Survey Project Map for each Unit on a hard copy (paper) and .pdf digital format. The Contractor may use this map for their Project Map and Plot Map, and plots and stratum boundaries may be hand-drawn on the map. **A computer-drafted map is not necessary.**

3) The Contractor shall also submit a digital shapefile for each Unit, unless there are no new stratum boundaries identified during the survey, in which case the Contractor will not be required to submit a shapefile. The Contractor's digital shapefile shall include only the inside block information, including strata boundaries, non-productive areas such as roads or swamps, and Standards Unit boundaries.

4) Where spatial data is not provided, or is incorrect for non productive area(s) such as roads, the Contractor shall collect this data in the field, including location and width of roads, in order to create a polygon on the Project Map and Plot Map.

5) For additional information concerning mapping and GIS requirements, please refer to the BCTS GIS Data Standards document attached in the Appendices. This document is also available on the Ministry FTP site located at*:*
https://www.for.gov.bc.ca/ftp/TCC/external/!publish/Data_Standards/ArcGIS/Silviculture/

12.04 Accurate and detailed access notes must be submitted, unless access is accurate within three hundred metres (300 m) of each road junction. If the Project Map that was provided to the Contractor at the pre-work already has correct access notes, the Contractor must indicate in the survey report and in the Silviculture Treatment activity screen - LRM database that the access notes were confirmed, along with the appropriate date, and surveyor's name. Otherwise, the Contractor must provide updated access directions to each Unit from the downtown corner of Highway 97 in Quesnel, and must reference mileage to corresponding landmarks (KM markers, major intersections, distinguishable features, etc.). The Contractor must provide comments on the current level of access (i.e.; 4wd, 2wd, ATV, Walk, access restrictions, etc) for all roads required to access the Unit.

12.05 Where handheld data loggers and survey software are used to collect plot data, a copy of the electronic or digital plot data shall be submitted to BCTS either on a CD, DVD or via electronic delivery via email and/or FTP site upon completion of the contract and will become the property of BCTS. The method of submission will be at the sole discretion of the Ministry Representative.

12.06 In situations where overstory volume, merchantable blowdown, or beetle-infested timber is present, the species, location, and estimated volume present must be discussed in the report. The report must also include recommendations and possible management solutions, including whether or not the volume should be salvaged, left on site for coarse woody debris, or felled and burned.

12.07 Any observed wildlife or wildlife den, species at risk, invasive alien plants, danger trees, or debris piles that require burning must be described in the survey report and their location noted on the map. A BCTS CCBA Species at Risk Field Observation Form must be completed when any species at risk is observed as required under the BCTS Environmental Management System.

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ARTICLE 13 ADDITIONAL FEES

13.01 If the Contractor makes a recommendation to amend the stocking standards in the Prescription from even-aged (single-layer) to multi-storied, and follows the survey procedures outlined in Article 6 (c) above, the Contractor may invoice for an additional ten percent (10%) on top of their Price Per Unit, but only for the affected area of the Unit, provided the Ministry Representative agrees with the recommendation.

ARTICLE 14 INSPECTION AND ACCEPTANCE

14.01 In addition to Article 11 and Article 13 of the Operational Services Contract, the following is applicable.

Contractor Request for Inspection and Acceptance

14.02 The Contractor shall provide to the Province, at the time the Contractor submits the request to the Province to inspect and accept the Work within a completed Payment Area, copies of the completed Deliverables as specified in this Agreement.

Method of Inspection

14.03 If the Deliverables are satisfactory, the Province shall conduct a reconnaissance of the Payment Area to carry out a preliminary assessment of the quality of the Work.

14.04 If, after any reconnaissance, the Province decides, in its discretion, to conduct field inspections of the corresponding Payment Area, it shall inspect ten percent (10%) or more of the Payment Area to determine compliance with the terms and conditions of this Agreement.

14.05 The Province will provide the Contractor with a copy of the inspection of the Deliverables and the preliminary assessment, and/or field inspection within fifteen (15) working days of the date of the inspection so that the Contractor is notified in a timely manner as to whether to proceed to the next activity or phase of Work; and/or any deficiencies or non-compliance with the Agreement.

Field Inspection

14.06 The Province shall conduct field inspections for all Surveys by checking, at its discretion, the results of all plots and lines established by the Contractor on a portion of the Payment Area or by establishing an independent survey of some of the Strata within the Payment Area.

14.07 Where the Province checks the results of actual plots established by the Contractor in an Opening, it shall inspect the greater of ten (10) plots established or ten percent (10%) of plots established, and the Province shall assess and compare the data it obtains with that collected by the Contractor for the same plots and, at a minimum, the following Survey results:

(a) well-spaced trees by species;

(b) plantable spots, preparable spots;

(c) total trees;

(d) brush hazard; and

(e) forest health factors.

14.08 In addition, the Province may assess other Survey information for allowable error tolerances listed in Clause 5.20 of this Schedule.

14.09 Where the Province conducts an independent survey, it shall survey tem percent (10%) or more of the strata within the Payment Area, and for each Stratum sampled by this survey, the Province shall compare (at the 95% confidence level) the Contractor's and the Province's estimates of the number of well-spaced trees and free-growing trees.

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Provision of Field Maps

14.10 The Province may request that the Contractor provide it with copies of Survey cards and field maps for any Stratum surveyed, and the Contractor shall supply the copies within a reasonable time period as agreed to by the Ministry Representative.

14.11 For the purpose of this request, a field map shall include, Standards Unit boundaries, stratification lines, point of commencement, Survey lines and if applicable, plot location.

ARTICLE 15 TABLE OF ASSESSMENTS

15.01 As per the Operational Services Contract, where, in the opinion of the Province, the Contractor has failed to perform or comply with any of its obligations under this Agreement, but is subsequently completed, the Province may, in its sole discretion, impose an assessment as agreed liquidated damages as follows:

Obligation and Issue	Assessment Rate
Failure to complete on or before the completion date specified in the Work Progress Plan for the Work.	$200 per occurrence
Failure to complete on or before the completion date specified in the Work Progress Plan for the Deliverables.	$200 per occurrence
Failure to complete on or before the completion date specified a Notice to the Contractor for any re-work.	$500 per occurrence
Failure to replace Key Personnel within required timeframe.	$200 per occurrence
Failure to attend a scheduled meeting.	$100 per meeting
Failure of a submitted Survey import files to upload.	$200 per file
Failure to submit a Regen Survey at least fifteen (15) days prior to the regen delay for the Standards Unit being surveyed.	$500.00 per occurrence
Failure to submit a survey report within 15 days of the survey date.	$50.00 per occurrence

ARTICLE 16 PAYMENT

Basic Payment

16.01 Payment for each Payment Area shall be based on the rates set out in Schedule 'B'.

Payment Reductions

16.02 The Province may deduct from any payment the amount of any charges it assesses against the Contractor pursuant to Article 15.00 of this Schedule.

Approval of Payment

16.03 The Province shall approve payment for any Payment Area where the Contractor has, in the sole opinion of the Province, satisfactorily completed and submitted all Deliverables and Silviculture Treatment Recommendations required for the Payment Area. The Province may approve partial payment for achievement of specified milestones as set out in the Work Progress Plan.

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ARTICLE 17 NON-COMPLIANCE AND TERMINATION

Unsatisfactory Work Quality

17.01 For the purpose of Clause 17.02 of this Schedule, unsatisfactory work quality means instances where:

(a) the Contractor makes errors in measurement that exceed the allowable errors specified in this Schedule;

(b) the Contractor fails to stratify an Opening according to the Stratification Criteria;

(c) the Contractor incorrectly identifies the Biogeoclimatic Zone, sub-zone, site series (ecosystem association) for a Stratum;

(d) the Contractor incorrectly identifies preferred or acceptable tree species as permitted under the Stocking Standards for the Stratum;

(e) the Contractor incorrectly identifies the order of the leading species and secondary species in the inventory label for a Stratum;

(f) the Contractor incorrectly identifies the stocking status for a Stratum [e.g., a satisfactorily restocked (SR) Stratum identified as not satisfactorily restocked (NSR)];

(g) the Province conducts an independent survey within a Stratum and determines that (at the 95% confidence level) the Contractor's and the Province's estimates of the number of well-spaced or free-growing trees are drawn from different populations;

(h) the Contractor fails to report a brush hazard that will, in the opinion of the Province, prevent the stand from attaining a free growing condition within the time specified in the standards;

(i) the Contractor fails to report any pest, pest damage, disease, disease damage or other physical damage which is present in the Opening; or,

(j) the Contractor submits Deliverables that are illegible, incomplete, contains errors or omissions, or that are false.

17.02 In addition to the remedies specified in the Operational Services Contract, if the Contractor's Work quality is unsatisfactory:

(a) the Province shall promptly notify the Contractor, and

(b) the notice shall:

i. specify the fault, give the Contractor a deadline for compliance, and specify if the Province wishes to exercise its option to require the Contractor to rework the unsatisfactory Payment Area; or,

ii. specify the fault, indicate that the Province will exercise its option to correct the unsatisfactory work, and deduct from payment all direct and indirect costs incurred by the Province for correcting the unsatisfactory work.

17.03 If the Contractor fails to comply by the specified deadline for compliance, or if any inspection of further Work indicates that Work is again unsatisfactory, the Province may terminate this Agreement forthwith.

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