

Lesson 4

Spacing – Contract Monitoring

45 minutes

Objectives:

1. The participants will be aware of the general requirements for monitoring spacing contracts.
2. The participants will be aware of Code requirements and associated non-compliance inspections and penalties for monitoring spacing contracts.

Equipment Needs:

- ▲ Overhead projector
- ▲ Flip chart
- ▲ *Juvenile Spacing Quality Inspection* booklet.



Method:

A short lecturette and discussion to review the Standards Agreement – Schedule A of the contract and monitoring procedures as described in the *Juvenile Spacing Quality Inspection* booklet.

Notes:

Standards Agreement – Schedule A of the Spacing Contract

Four overheads to be developed by the Facilitator

	Province of British Columbia	Ministry of Forests		<div style="border: 1px solid black; padding: 5px; background-color: #e0e0e0;"> Silviculture Contract </div> FOR STAND TENDING – SPACING
SILVICULTURE CONTRACT ADMIN. NO:		ATTACHMENT TO CONTRACT DATED THE _____ DAY OF _____, 19 _____.		
SCHEDULE "A"				
ARTICLE 1: GENERAL CONDITIONS				
Definitions				
1.01 In this Schedule, the following words shall have the following meanings:				
<p>"Crop Tree" means a tree that combines as many of the following characteristics as possible:</p> <ul style="list-style-type: none"> (a) preferred species as specified in Schedule 'B'; (b) dominant and co-dominant trees; (c) free of injury and disease; (d) full crown; (e) straight stem; (f) free from forks or multiple tops; (g) small branches; (h) good terminal growth; and (i) good colour. 				
<p>"Danger Tree" means a live or dead tree whose trunk, root system or branches have deteriorated or been damaged to such an extent as to be a potential danger to human safety;</p>				
<p>"Intertree Distance" means the horizontal distance between two adjacent Leave and/or Crop Trees;</p>				
<p>"Leave Tree" means a Crop Tree or any other tree left as permitted by this Contract except for dead trees, White Pine and Pacific Yew;</p>				
<p>"No Treatment Zone" means an area within which no Spacing takes place;</p>				
<p>"Opening" means an area in the original stand that has an average diameter greater than twice the target Intertree Distance specified in Schedule 'B';</p>				
<p>"Slash Removal Zone" means an area within which all slash created as a result of the Work is removed and redistributed into the adjacent Spaced Stand;</p>				
<p>"Snag" means a standing dead tree greater than three metres in height;</p>				
<p>"Spacing" means the reduction of the number of stems per hectare of the original stand within the Work Area to a predetermined post-Spacing density specified in this Contract;</p>				
<div style="border: 1px solid black; width: 60px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> Initials (Contractor) </div>		<div style="border: 1px solid black; width: 60px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> Initials (Province) </div>		
<p>"Spaced Stand" means the portion of the Work Area on which Spacing took place;</p>				
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Overhead: Standards Agreement – Schedule A of the Spacing Contract

Four overheads of the Standards Agreement – Schedule A, with key sections outlined in different colours. The Facilitator should develop these overheads.

Facilitator: The facilitator introduces this section by explaining the importance of the contract in setting the context and the rules for monitoring procedures. We have already discussed Schedule C, which outlines the site-specific clauses for the project. Schedule A contains the common clauses to all contracts.

Note: Schedule C can override the Standards Agreement – Schedule A if there are contradictory statements.

Review the structure of the MoF Standards Agreement – Schedule A, pointing out the sections specific to spacing contracts. The sections that are generic to all silvicultural contracts will not be discussed in any detail.

Key sections:

1.01 Definitions – Review to ensure people are aware of the content of this section. Some examples are:

- *Crop tree* (nine descriptors) *danger tree*, *leave tree*, etc.
- *Opening* (natural) and a *void* (overcutting).

1.02 – 1.05 – Standard MoF clauses – includes insurance requirements.

1.06 – Compliance with SMP – this clause is put in for non-MoF projects where a licensee uses subcontractors that are acting on behalf of the DM. This clause reduces the DM's risk.

Article 2 Standards of Performance

▲ You should be *intimate* with these.

▲ This section will define some of the faults which you will look for in inspection plots.

2.03 Snags and Wildlife Trees

- ▲ The contractor has the responsibility to establish “no-work zones.” Often you may want to establish these yourself. Note, however, that you have the flexibility to get the contractor to do it.
- ▲ The contractor must have an experienced snag faller for the snags.

2.04 White Pine and Yew

Unless otherwise stated (Schedule C can override), white pine and yew should not be cut. They will be counted as ghost trees in inspection plots, so the spacers treat them like they are not there.

2.05–2.17 Get the participants to read this and see if there are any questions.

Article 3 Inspection and Acceptance

Here is where the procedures are effectively outlined.

Ask: **How many of the participants are comfortable with the standard ministry inspection procedures?** (they have not changed in the last several years).

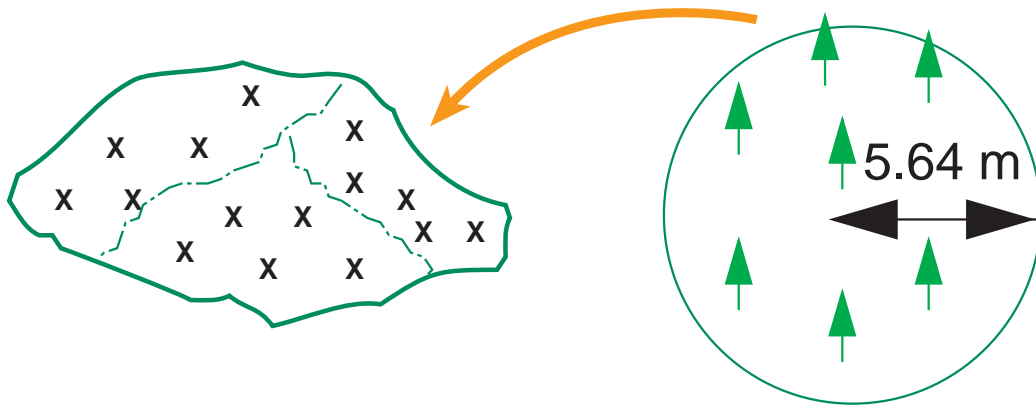
Also ask – how many have used the booklet: *Juvenile Spacing Quality Inspection*, February, 1994 (FS 251).

- ▲ Point out that they should have a photocopy of this booklet in their binders and they should get one for their vest in the field.
- ▲ Use the optional overheads that follow only if the comfort level is not there.
- ▲ If they are comfortable with inspection procedures, go straight to Part 5 of the Standards Agreement – Schedule A – Non-Compliance and Termination.

Note: Where conflict is found between the Standards Agreement – Schedule A and Schedule C, the information found in Schedule C prevails.

Survey Methods for Spacing Quality Inspections

- 1% sample with a minimum of 5 plots per payment area.



- Payment area – distinctly different work quality
- Usual pot size – 0.01 ha
- Larger plots for widely spaced, clumpy stands.

Optional Overhead: Survey Methods for Spacing
Quality Inspections

Facilitator: Get them to turn to page 4 of the *Juvenile Spacing Quality Inspection* booklet.

Key points:

- ▲ The sampling plot is a circular 0.01 ha plot (5.64 m in radius);
 - Larger plots for widely spaced clumpy stands (clumps are widely spaced)
- ▲ A 1% sample is used with one 0.01 ha plot per hectare.
- ▲ A minimum of 5 plots is recommended per payment area.
- ▲ You should stratify out any mappable portion (0.5–1.0 ha?) of the work area that has distinctly different quality as a separate payment area.

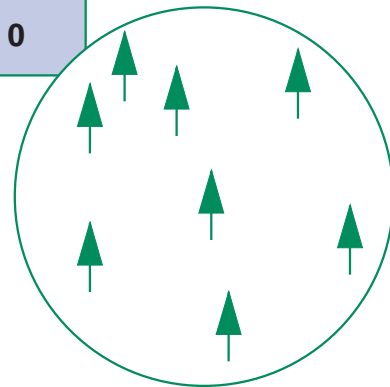
Notes:

Optional Overhead

Examples of Inspection Plots

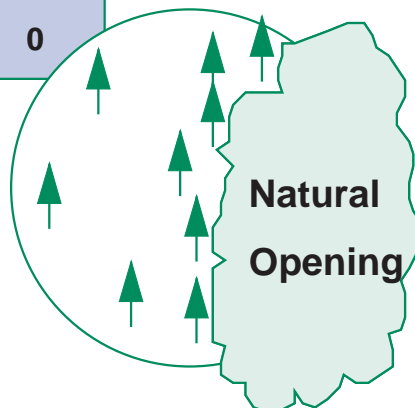
- Variation in inter-tree spacing

Total trees	Well-spaced trees	Allow. leave trees	Rework errors	Non-rework errors	Voids
8	8	8	0	0	0



- Dealing with natural openings

Total trees	Well-spaced trees	Allow. leave trees	Rework errors	Non-rework errors	Voids
9	9	9	0	0	0



Optional Overhead: Examples of Inspection Plots



Facilitator: The two plots illustrate several important concepts:

1. Plot 3 – How to work with variation in the plots.
 - ▲ The variation is provided in the Schedule B to allow the spacer judgement to pick the best tree on the best microsite.
 - ▲ A good spacer will balance the trees spaced near the minimum inter-tree spacing with trees spaced further apart to come close to the target density per hectare, without leaving excess trees, coming in below the minimum density or creating voids.
 2. Plot 4 – the Standards Agreement – Schedule A states that spacing can be reduced down to $1/2$ of the target spacing around openings (defined as $2 \times$ the target spacing in width).
 - ▲ This allowance can be superseded by specifications in the Schedule C.
 3. **Other notes** – Define what the columns for data mean:
 - ▲ *Total trees* – all leave trees in the plot.
 - ▲ *Well spaced* – these are acceptable trees that are spaced as per the contract.
 - ▲ *Allowable leave trees* – the # of leave trees that could have been left. This will be different from the well-spaced # where the spacer creates voids or consistently spaces at a wide inter-tree distance.
 - ▲ *Rework errors* – a range of faults with associated fault codes that can be re-worked;
 - Excess trees, hinged trees, live branches, etc.
(see Section 3.02 – Standards Agreement – Schedule A).
 - ▲ *Non-reworkable errors* – a range of faults by error code that cannot be reworked;
 - Because they involve damage or cutting of designated leave trees (cutting no-cut species, damage to a leave tree, improper leave-tree selection, etc.).
- Note:** If you need more information on this, read the blue book and check locally for one-day spacing quality inspection training sessions.

Note: Not much has changed here since the Code.

Optional Overhead

Contract Payment Calculations

 		CONTRACT SPACING PAYMENT CALCULATIONS				
SPACING CONTRACT JS95DB0-001		CONTRACTOR ACE				
UNIT NO. A	EXAMINED BY J. Smith	DATE Y M D 94 05 16				
FOREST REGION Nelson (N)		FOREST DISTRICT Boundary (6)				
SUMMARY OF POST-SPACING EXAMINATION (from FS 749s)						
A	B	C	D	E	F	G
TOTAL NUMBER OF PLOTS	TOTAL NUMBER OF TREES	NO. OF WELL-SPACED TREES	NO. OF ALLOWABLE LEAVE TREES	NO. OF REWORKABLE ERRORS	NO. OF NON-REWORKABLE ERRORS	VOIDS
10	70	66	68	5	0	
PAYMENT PERCENT CALCULATION						
SPACING PERCENT				$\frac{C}{D} \times 100 = \underline{97.06} \%$ (If > 100%, enter 100%)		
ERRORS						
Reworkable Errors %		$\frac{E}{D} \times 100 = \underline{7.35} \%$				
Non-reworkable Errors %		$\frac{F}{D} \times 200 = \underline{\hspace{2cm}} \%$				
Total Errors % = (Reworkable + Non-reworkable) - $\underline{\hspace{2cm}}$ % tolerance* = $\underline{7.35} \%$						
*Tolerances allow for variable terrain or work conditions. A maximum of 5% is permitted, as specified in contract.						
PERFORMANCE QUALITY (P.Q.) = Spacing % - Total Errors % = $\underline{89.7} \%$						
The Performance Quality is applied into the following formula: $\text{Payment \%}^{**} = (\text{PQ} \times 1.08) - \left(\frac{[100 - (\text{PQ} \times 1.08)]^2}{8} \right)$ **Maximum of 100% Refer to back of card for a Juvenile Spacing Payment Quick Reference Guide.						
DEDUCTIONS \$ _____				PAYMENT % = $\underline{95.66} \%$		
CONTRACTOR'S SIGNATURE <i>ABC Contracting</i>			MINISTRY OFFICER'S SIGNATURE <i>J. Brown</i>			

FS 767B HSP 94/5

Optional Overhead: Contract Payment Calculations

Facilitator: Review the parts of the FS 767B Payment Calculation Form.

Key points:

- ▲ % spacing is calculated as a % of well-spaced leave trees over total allowable leave trees.
- ▲ Errors are calculated – **but note that non-reworkable errors carry double the weight!** These you really want to avoid.
- ▲ Performance quality = % spacing – % errors
- ▲ Payment allows for some error in data collection on a sliding scale – the formula for doing so is at the bottom of the page.

Optional Overhead

Performance Quality vs Payment

JUVENILE SPACING PAYMENT QUICK REFERENCE GUIDE

PQ %	PAY %	PQ %	PAY %	PQ %	PAY %
100.00	100.00	90.50	97.10	87.40	90.46
99.00	100.00	90.40	96.93	87.30	90.20
98.00	100.00	90.30	96.76	87.20	89.94
96.00	100.00	90.20	96.58	87.10	89.67
95.00	100.00	90.10	96.40	87.00	89.40
94.00	100.00	90.00	96.22	86.90	89.13
93.00	100.00	89.90	96.03	86.80	88.85
92.90	100.00	89.80	95.85	86.70	88.57
92.80	100.00	89.70	95.66	86.60	88.29
92.70	100.00	89.60	95.46	86.50	88.01
92.60	100.00	89.50	95.27	86.40	87.72
92.50	99.90	89.40	95.07	86.30	87.43
92.40	99.79	89.30	94.86	86.20	87.14
92.30	99.67	89.20	94.66	86.10	86.84
92.20	99.55	89.10	94.45	86.00	86.54
92.10	99.43	89.00	94.24	85.00	83.40
92.00	99.31	88.90	94.02	84.00	79.96
91.90	99.18	88.80	93.81	83.00	76.22
91.80	99.05	88.70	93.59	81.00	67.89
91.70	98.92	88.60	93.36	80.00	63.28
91.60	98.78	88.50	93.14	79.00	58.38
91.50	98.65	88.40	92.91	78.00	53.19
91.40	98.50	88.30	92.68	77.00	47.71
91.30	98.36	88.20	92.44	76.00	41.94
91.20	98.21	88.10	92.21	75.00	35.88
91.10	98.06	88.00	91.96	74.00	29.52
91.00	97.91	87.90	91.72	73.00	22.87
90.90	97.75	87.80	91.48	72.00	15.93
90.80	97.60	87.70	91.23	71.00	8.70
90.70	97.43	87.60	90.97	70.00	1.18
90.60	97.27	87.50	90.72	69.00	0.00

PQ = 89.70%

Pay % = 95.66%

Optional Overhead: Performance Quality vs. Payment

Facilitator: Review the parts of the FS 767B Payment Calculation Form – back side.

Key points:

▲ Use the example of 89.7% quality, which gives 95.66% payment.

Standards Agreement – Schedule A

ARTICLE 5: NON-COMPLIANCE, TERMINATION

Unacceptable Work Quality

- 5.1 Whenever an inspection indicates performance quality to be less than the minimum acceptable standard of eighty-five percent (85%) the Recipient shall consider its performance to be unsatisfactory and shall immediately notify the Ministry Representative of the unsatisfactory performance.
- 5.2 Following receipt of a notification under the previous section, or following an inspection by the Province that indicates performance quality to be unsatisfactory, the Province shall in a written notice:
- (a) give the Recipient a deadline by which time performance quality must be raised to the minimum acceptable standard; and
 - (b) specify if the Province wishes to exercise its option to require the Recipient to re-work the substandard area.
- 5.3 If the Recipient fails to raise performance quality to at least eighty-five percent (85%) by the deadline specified, or if any inspection of further work under this Agreement indicates that quality is again below eighty-five percent (85%), the Province:
- (a) may notify the Recipient that all or a portion of the Schedule B associated with the unsatisfactory performance is cancelled and this Agreement shall be deemed to be amended accordingly; or
 - (b) may terminate this Agreement.
- 5.4 Should the Recipient fail to
- (a) Immediately notify the Province of unsatisfactory performance as required in section 5.1; or
 - (b) comply with a notice from the Province that demands that the performance quality of the Work in the Work Unit be raised to an acceptable standard by a specified deadline;
- the Province shall recommend FRBC make no payment for that Work Unit and may terminate all or part of this Agreement forthwith.
- 5.5 If after giving notice under Section 5.2, an inspection of further Work indicates that Performance Quality is again below 85%, and in the opinion of the Province cannot be improved by reworking, the Province may, in addition to any other remedy provided under this Agreement, recommend Forest Renewal BC reduce the Basic Payment by one hundred dollars (\$100) for each spacing error within the inspection plots installed after the notice, up to a total not exceeding two thousand dollars (\$2,000).

Failure to Establish No Treatment Zones

- 5.6 If the Recipient fails to establish a No Treatment Zone, as specified in this Agreement, the Province may recommend Forest Renewal BC reduce the basic payment by two hundred and fifty dollars (\$250) for each such occurrence.

Voids

- 5.7 If the Recipient creates Voids, the Province may recommend Forest Renewal BC reduce the basic payment by one hundred dollars (\$100) for each Void.

Optional Overhead: Overhead of the Standards Agreement –Schedule A – Article 5 – Non-compliance and termination

Facilitator:

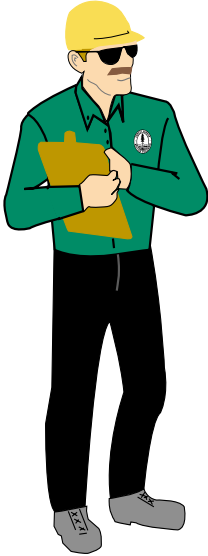
Key points:

- ▲ If performance quality is <85% for a payment unit:
 - Considered unsatisfactory performance,
 - May require re-work if possible, and
 - If it cannot be re-worked, can impose an assessment of \$100 for each error found in the assessment plots (10 errors = \$1000).
- ▲ Sections 5.06 – failure to respect or establish NO TREATMENT zones; Section 5.07 creation of VOIDS – all carry \$100 to \$250 fines.

Notes:



Code Compliance



Compliance Inspections

- Use same sampling procedures
- Min. performance = 85% quality

Penalties

- Be familiar with the regulations

SO...

What does this mean to you??



Optional Overhead: Code Compliance

Facilitator:

Key points:

- ▲ Inspections will be done to ensure compliance with the SMP and the associated standards.
- ▲ The ministry will use the same procedures as outlined in the Schedule A and the *Juvenile Spacing Quality Assessment* booklet.
- ▲ The minimum performance quality will be 85% as measured by the ministry procedures.

Note the potential fines for non-compliance:

- ▲ The *Forest Practices Code of British Columbia Act* – Section 67-2(d) and the *Silviculture Practices Regulations* – Section 12(1) [*Facilitator to supply new SPR section number references when available*] both pertain to the types of stand damage that would relate to non-reworkable errors. In most cases these will be the reasons for non-compliance.
- ▲ Non-compliance with these sections of the *Act* and regulations carry the following penalties:
 - Administrative Penalty – up to \$5000/tree,
 - It is not clear if this will be up to \$5000 per fault or error in the plots or extrapolated to a per hectare basis, and
 - Compare these fines to those which you impose on your contractor in the Schedule A.
- ▲ **What is the bottom line?** – What does this mean to you?
 - It is absolutely critical to monitor your projects closely, especially with regard to non-reworkable errors.
 - Work very closely with the contractor to begin with to ensure that the objectives and standards are clear. Make sure everyone is aware of no-treatment zones, wildlife trees, etc.
 - Monitor every day and identify poor quality quickly. Stratify it out, and make it a payment area.
 - Never let non-reworkable errors get out of hand. Shutting down the contractor is better than allowing it to continue. Remember there should be less pressure to finish the job with the same contractor, as say with planting, since you have no trees waiting to get into the ground, etc.

Notes: