

File: 280-20

JUL - 1 2004

BY EMAIL

To: Cindy Stern
Regional Manager
Coast Forest Region

From: The Honourable Michael de Jong
Minister of Forests

Re: Amendment No. 1 to the *Coast Appraisal Manual*

I hereby approve Amendment No. 1 to the *Coast Appraisal Manual* and attach a copy for your use. The following sections have been amended:



Sections 2.3.1 and 2.3.2:	Sections have been renumbered.
Section 4.4.2:	Updated cost estimates.
Section 4.4.4(2):	Updated cost estimate.
Section 5.2:	Updated cost estimates
Section 5.3.2.1:	Housekeeping.
Table 5-3:	Updated cost estimates.
Table 5-4:	Updated cost estimates.
Table 5-5:	Updated cost estimates.
Section 5.3.3.3.1(2):	Housekeeping.
Section 5.4(3) and (4):	Updated cost estimates.
Table 5-7:	Updated cost estimates.
Table 7-1:	New harvest billing codes.



This amendment will come into force on July 1, 2004. Further amendments or revisions to this manual require my approval.


Michael de Jong
Minister

Attachment

pc: Bill Howard, Director, Revenue Branch

All Subscribers, *Coast Appraisal Manual*



FOR FURTHER INFORMATION CONTACT:

George Silvestrini
Sr. Timber Pricing Forester (Coast)
Revenue Branch
Ministry of Forests
Victoria, B.C.
V8W 3E7
Phone: 387-8377
E-mail: george.silvestrini@gems9.gov.bc.ca
FAX: 387-5670

MANUAL TITLE

Coast Appraisal Manual

REVISION No.

Amendment No. 1

ISSUE DATE

July 1, 2004

MANUAL CO-ORDINATOR

Judy Laton
Revenue Branch

AUTHORIZATION (Name, Title)

W. Howard
Director, Revenue Branch

Please make the following changes to your copy of the above Ministry manual. Please insert the following specified pages and **file this notice** immediately after the Amendments Tab.

ACTION (Remove/Insert)	(VOL.) CHAPTER-SECTION-SUBJECT	PAGE(S)	COMMENTS
REMOVE	Table of Contents	i - ii	After Table of Contents Tab
INSERT	Table of Contents	i - ii	
REMOVE	Chapter 2	5 - 6	After Chapter 2 Tab
INSERT	Chapter 2	5 - 8	
REMOVE	Chapter 4	19 - 22	After Chapter 4 Tab
INSERT	Chapter 4	19 - 22	
REMOVE	Chapter 5	3 - 4 9 - 10 13 - 18 23 - 26	After Chapter 5 Tab
INSERT	Chapter 5	3 - 4 9 - 10 13 - 18 23 - 26	
REMOVE	Chapter 7	9 - 10	After Chapter 7 Tab
INSERT	Chapter 7	9 - 10	
REMOVE	Index	1 - 2	After Index Tab
INSERT	Index	1 - 2	
INSERT	Minister's Letter and Transmittal		After Amendments Tab

Table of Contents

1 Definitions and Interpretations

1.1 Definitions and Interpretations	1-2
---	-----

2 Scope and Requirements

2.1 Terms of Reference	2-2
2.1.1 Responsibility for Stumpage Determinations.....	2-2
2.2 Numbering System	2-3
2.2.1 Calculation Conventions	2-3
2.2.2 Cutblocks within a Cutting Authority Area	2-3
2.3 Cruise Information	2-5
2.4 Appraisal Data Submission	2-7
2.5 Appraisal Map.....	2-8

3 Appraisals, Reappraisals and Quarterly Adjustments

3.1 Types of Determination.....	3-2
3.2 Appraisals.....	3-3
3.3 Reappraisals	3-5
3.3.1 Changed Circumstances	3-5
3.3.1.1 Changed Circumstance Reappraisal Procedure.....	3-6
3.3.1.2 Effective Date of Changed Circumstance Reappraisal	3-6
3.3.2 Annual Reappraisal of a Road Permit	3-7
3.3.3 Minister's Direction	3-7
3.3.3.1 Minister's Direction Reappraisal Procedure	3-7
3.4 Quarterly Adjustments	3-8
3.5 Fixed Rates and Extensions of Term.....	3-9
3.6 Correctable Errors	3-11

4 Estimated Winning Bid

4.1 Appraisal Methodology.....	4-2
4.2 Market Pricing System (MPS) Variables	4-3
4.2.1 Log Selling Prices	4-5
4.2.1.1 Coniferous Timber	4-5
4.2.2 Log Grade Percentages.....	4-6
4.2.2.1 Billing History Record	4-6

4.2.2.2 Log Grade Percentage Criteria	4-7
4.2.2.3 Source of Log Grade Percentage for Each Cutting Authority	4-9
4.2.2.4 Damaged Timber	4-12
4.2.3 Stand Selling Price	4-12
4.2.3.1 Stand Selling Price Calculation	4-12
4.2.4 Truck Hauling	4-14
4.2.5 Marine Log Transportation	4-14
4.2.5.1 Point of Appraisal	4-14
4.2.5.2 Towing or Barging	4-15
4.3 Estimated Winning Bid (EWB) Equation	4-18
4.3.1 Estimated Number of Bidders (ENB) Equation	4-18
4.3.2 Steps to Calculating Preliminary Estimated Winning Bid (PEWB)	4-18
4.4 Specified Operations	4-19
4.4.1 Skyline	4-19
4.4.2 Inland Water Transportation	4-19
4.4.3 Tree Crown Modification	4-20
4.4.4 Clayoquot Sound Operating Costs	4-21
4.4.5 Helicopter Single Standing Stem Selection	4-21
4.4.6 Second Growth Coniferous Timber	4-21
4.5 Final Estimated Winning Bid	4-22

5 Tenure Obligation Adjustments

5.1 Tenure Obligation Adjustment	5-2
5.2 Forest Planning and Administration Cost	5-3
5.2.1 Low Volume Cost	5-3
5.3 Road Development Cost	5-4
5.3.1 Road Development Cost Proration	5-5
5.3.1.2 New Road Construction	5-6
5.3.1.3 Road Reconstruction	5-7
5.3.1.4 Total Road Development Cost	5-9
5.3.2 Existing Roads	5-9
5.3.2.1 Extended Road Amortization	5-9
5.3.3 Tabular Cost Estimates	5-9
5.3.3.1 Subgrade Construction	5-10
5.3.3.2 Bridges and Culverts	5-14
5.3.3.3 Additional Stabilizing Material	5-17
5.3.4 Non-tabular Cost Estimates	5-20
5.3.4.1 Data Requirements	5-21
5.4 Road Maintenance Cost	5-23
5.5 Road Use Charges	5-24
5.6 Basic Silviculture Cost	5-26
5.7 'Y' Grade Number	5-27
5.8 Market Logger Road Cost	5-28

2.3 Cruise Information

1. A licensee or BCTS must gather and compile cruise data in accordance with the following ministry publications and the coast timber merchantability specifications in Table 2-1:
 - a. *Cruising Manual*, (*Cruising Manual* web site: <http://www.for.gov.bc.ca/hva/manuals/cruising/>),
 - b. *Cruise Compilation Manual*.

Table 2-1 Coast Timber Merchantability Specifications

Description		
The following coast timber merchantability specifications must be used in all appraisals.		
	Mature	Immature
1. Maximum stump height (measured from the top of the stump down to the highest ground level adjacent to the stump)	30.0 cm	30.0 cm
2. Minimum slab thickness for cedar only	15.0 cm	10.0 cm
3. Minimum top diameter (inside of the bark)	15.0 cm	10.0 cm
4. Minimum length of a log or slab	3.0 m	3.0 m
In this table "mature" means timber which has an average age of 121 years or older and "immature" means timber which has an average age of less than 121 years.		

2. The licensee must provide, when requested by the district manager a photocopy of the tally sheets and an electronic version of the compilation in a format specified by the regional manager.
3.
 - a. The cutting authority area will be appraised using the total net cruise volume of timber authorized for harvest in that area.
 - b. The total area of merchantable timber in the cutting authority area is obtained from the appraisal summary of the cruise compilation report.
4. If the licensee or BCTS modifies its application for a cutting authority the applicant must recompile the cruise data when any of compiled plots used in the cruise lie outside the boundaries of the proposed cutting authority area.
5.
 - a. Where a boundary of a cutting authority area has been changed after the appraisal or reappraisal of the cutting authority area, every reappraisal of the cutting authority area must use the total net cruise volume of the cutting authority area as it is after the boundary has changed.

- b. If, after a cruise compilation or recompile was used for an appraisal or reappraisal, the total of all additions or deletions of areas containing merchantable timber made to the cutting authority area exceeds twenty-five hectares or twenty-five percent of the area containing merchantable timber, whichever is less, the entire cruise must be recompiled.

2.4 Appraisal Data Submission

The form of the appraisal data submission required by the director may be found at:

<http://www.for.gov.bc.ca/hva/ECAS/index.htm>

2.5 Appraisal Map

The appraisal map must be completed in accordance with the requirements of Appendix V of this manual.

4.4 Specified Operations

1. The specified operations in sections 4.4.1 to 4.4.6 may be considered in an appraisal or a reappraisal.

4.4.1 Skyline

1. A skyline adjustment expressed in $\$/\text{m}^3$ may be calculated for those areas within a cutblock that:
 - a. are 600 metres or greater measured in a straight line horizontal distance from the centre of the closest possible landing or place where a landing may be located, and
 - b. are yarded by skyline.
2. The skyline adjustment may be calculated by adding the volume of timber to which the skyline may apply to the volume of timber to be helicopter yarded as prescribed in section 4.2.

4.4.2 Inland Water Transportation

1. Except as provided in subsections 3 and 4 of this section, an inland water transportation adjustment will be determined where timber must be towed on Great Central, Owikeno or Powell Lake, or any other inland water approved by the person that determines the stumpage rate in order for the timber to be transported to the point of appraisal.
2. The adjustment shall be determined by applying the following equation:

$$\$/\text{m}^3 = 3.498 + 0.01865 (D)$$

Where:

D = Inland water tow distance in km.

3. Where the Silverhope Creek point of origin is used in the appraisal or reappraisal of a cutting authority area the inland water tow adjustment is $\$2.25/\text{m}^3$.
4. Where timber is towed on Harrison Lake:
 - a. The following equation shall be used to calculate an inland water tow adjustment where the point of origin that must be used in the appraisal or reappraisal is mid-Harrison Lake (HALM).

$$$/m^3 = -0.09690 + 0.008207 (D1) + 0.04628 (D2)$$

Where:

D1 = tow distance from the appraisal log dump to Pitt River Bridge point of appraisal, and

D2 = truck haul distance from the appraisal log dump to Harrison Bay.

- b. Where the point of origin that must be used in the appraisal or reappraisal is head Harrison Lake (HALH) the following equation shall be used to calculate the inland water tow adjustment:

$$$/m^3 = 4.2223 + 0.008207 (D1) + 0.01045 (D2)$$

Where:

D1 = tow distance from the appraisal log dump to Pitt River point of appraisal.

D2 = tow distance from the appraisal log dump to mid-Harrison Lake point of origin.

4.4.3 Tree Crown Modification

1. Where the district manager approves the protection of trees from wind throw by tree crown modification, a tree crown modification adjustment may be considered in the appraisal or reappraisal.
2. The adjustment is the sum of the costs for all of the trees that are modified divided by the total net cruise volume of the cutting authority area.
3. Where tree crown modification is approved:
 - a. the rate for each mature coniferous tree that is modified is \$53.50, and
 - b. the rate for each second growth coniferous tree that is modified is \$36.38.

4.4.4 Clayoquot Sound Operating Costs

1. For the purposes of this section the Clayoquot Sound area is:

That part of the Hesquiat Peninsula, Esowista Peninsula, and the Islands, sea and all lands and waters draining into the Pacific Ocean from the height of land between Escalante Point and Quisitis Point.

2. An adjustment of \$13.31/m³ will be included in an appraisal or a reappraisal of a cutting authority area that is located entirely within the Clayoquot Sound area.

4.4.5 Helicopter Single Standing Stem Selection

1. In this manual helicopter single standing stem selection means the harvesting of standing single trees that have been marked, limbed, undercut and wedged and then broken from the stump and removed using a helicopter.
2. The adjustment for helicopter single standing stem selection includes the cost of marking, climbing, limbing, undercutting, wedging, breaking and removal of the tree by helicopter.
3. The adjustment for helicopter single standing stem selection is \$37.78/m³.

4.4.6 Second Growth Coniferous Timber

1. A second growth coniferous timber adjustment will be included in an appraisal or reappraisal of the cutting authority area as follows:
 - a. For an appraisal where the effective date of the stumpage rate determined is:
 - i. between February 29, 2004 and December 31, 2004, the adjustment shall be \$3.67/m³;
 - ii. between January 1, 2005 and December 31, 2005, the adjustment shall be \$1.84/m³.
 - b. No adjustment will be included in an appraisal or a reappraisal of a cutting authority area where the effective date of the stumpage rate determined is after December 31, 2005.

4.5 Final Estimated Winning Bid

1. Subject to subsection 3 of this section the Final Estimated Winning Bid (FEWB) is the difference between the preliminary estimated winning bid and the total of the specified operations adjustments that are applicable to the appraisal or reappraisal of the cutting authority.
2. Expressed as an equation:

$$\text{FEWB} = \text{PEWB} - \text{SOA}$$

Where:

PEWB = The Preliminary Estimated Winning Bid determined under section 4.3.2.

SOA = The sum of specified operations adjustments considered in an appraisal or a reappraisal of a cutting authority area as may be calculated under sections 4.4.1 through 4.4.6 and expressed in \$/m³.

3. Where the FEWB calculated is less than \$0.25/m³, then the FEWB shall be \$0.25/m³.

5.2 Forest Planning and Administration Cost

1. The forest planning and administration cost is based on surveyed expenses at the corporate licensee level including all aspects of executive and administrative expenses at the head office attributable to the harvest of Crown timber. The kinds of expenses that were taken into consideration to calculate this cost were:
 - a. head office general and administrative expenses (\$3.38/m³).
 - b. logging department, log trading and log supply expenses (\$3.98/m³).
 - c. fees and taxes applicable to stumpage bearing timber (\$0.83/m³).
 - d. engineering and forestry overhead expenses (\$4.77/m³).
2. The total forest planning and administration cost is \$12.96/m³.

5.2.1 Low Volume Cost

1. A low volume cost of \$7.51/m³ may be included in the tenure obligation adjustment where:
 - a. the cutting authority area being appraised or reappraised is the subject of cutting authority issued under a licence that provides for an allowable annual cut of not more than 10 000 m³ of Crown timber, and
 - b. either the total net cruise volume of the cutting authority area or the licence's allowable annual cut is not more than 5 000 m³.

5.3 Road Development Cost

1. Except as provided in section 5.3.2, where a road development provides access to Crown timber a road development cost may be estimated for new road construction, and road reconstruction.
2.
 - a. Except as provided in subsections (2)(b) and (2)(c) of this section the total net cruise volume is used to calculate the unit cost for new road construction and road reconstruction in an appraisal or reappraisal of a cutting authority area.
 - b. Where a road development project was not taken into consideration in a prior appraisal or reappraisal of the cutting authority area, the remaining volume shall be used to calculate the road development unit cost for that project in the reappraisal of the cutting authority area.
 - c. Where the reappraisal is because of sudden and severe damage the road development cost is calculated as follows:
 - i) The road construction project costs prior to the sudden and severe damage reappraisal are totalled,
 - ii) The sum of those project costs is the total project cost.
 - iii) From the total project cost calculated in subsection 2(d)(i) of this section is subtracted the product of the total project cost multiplied by the total volume of timber in the billing history record of the cutting authority area on the effective date of the reappraisal, divided by the total net cruise volume of the cutting authority area.
 - iv) The difference calculated in subsection (2)(d)(iii) of this section is then divided by the sum of the remaining volume plus the volume of timber that was suddenly and severely damaged,
 - v) The calculation of the road development cost expressed as an algorithm is:

$$\text{Road Development Cost} = \frac{\text{total project cost} - (\text{total project costs} \times \text{volume in the billing history record}) / \text{total net cruise volume}}{\text{remaining volume} + \text{volume suddenly and severely damaged}}$$

3. Except as further provided for in this manual the road development cost for a road development may only be used in the appraisal or reappraisal of a tributary cutting authority area.
4. A road development cost may be amortized in accordance with section 5.3.2.1.

5.3.1.4 Total Road Development Cost

1. The total road development cost is the sum of the total new road construction unit cost plus the total road reconstruction unit cost.

5.3.2 Existing Roads

1. The following roads may not be considered in the appraisal or reappraisal of a cutting authority area:
 - a. a road that has been previously considered in an appraisal or reappraisal of another cutting authority area,
 - b. a road previously constructed to access private timber, and
 - c. a road previously constructed in whole or in part for a purpose unrelated to the harvesting of timber on the cutting authority area being appraised or reappraised.

5.3.2.1 Extended Road Amortization

1. Subject to subsection (2) of this section where the total road development cost calculated in an appraisal or reappraisal is greater than \$14.00/m³, the licensee and regional manager may agree that only a portion of an estimated road development cost will be used in the appraisal or reappraisal of the cutting authority area and that the balance of the estimated road development cost will be used in the appraisal or reappraisal of another tributary cutting authority area.
2.
 - a. Each cutting authority area must be in the licensee's approved forest development plan or woodlot licence area,
 - b. The agreement must provide that:
 - i. it may not be changed unless by agreement of the parties, and
 - ii. it is entered into only for the purposes of calculating a stumpage rate and confers no obligation on the Crown to compensate the licensee for any unamortized costs.

5.3.3 Tabular Cost Estimates

1. A tabular cost estimate must be calculated on the basis that the construction project will be completed using commonly used logging road construction practices and that the roads will have single lane width roads, turnouts and landings.

2. Weighted averages for each variable (eg. uphill side slope, rock, etc.) are applied to each road section. Averages are obtained by weighting the cross-section measurements taken at representative points along the road by the applicable road section length. The length of bridges and end haul sections in each section of a road that are appraised under section 5.3.4 may not be used in the calculation of this estimate.

5.3.3.1 Subgrade Construction

1. The estimated cost per kilometre for subgrade construction is provided for each combination of construction category and uphill side-slope for two rock mass classification categories, 'RMC 5 Only' and 'Other RMC's'.
2. Construction category (CC) is determined on the basis of the percent rock in relation to the total volume of all materials.
3. The percent rock is determined as follows:

$$\% \text{ rock} = \frac{h^2}{H^2} * 100\%$$

Where:

h = the vertical cut height of all rock measured from the bottom of the ditch

H = the total vertical cut height of all materials including organic layers, glacial till and hardpan measured from the bottom of the ditch

4. Construction category may show a range of variation ($\pm$ one CC) within any section length, and is recorded to the nearest integer. Hardpan is CC1, whether drilled and blasted or not. Rippable rock and boulders may occur in CC2 to CC6.
5. The following table defines the construction categories.

Table 5-1: Construction Categories

Construction Category (CC)	1	2	3	4	5	6
% rock	0	1-12	13-37	38-62	63-87	88+

6. Rock mass classification (RMC) is based on the physical characteristics of rock encountered in forest road development and is the subject of a report commissioned by the Forest Engineering Research Institute of Canada in 1978 and prepared by Piteau & Associates/Geotechnical Consultants.

Table 5-2: Subgrade Construction Cost Estimates Expressed in Thousands of Dollars per Kilometre

a) RMC 5 ONLY						
Uphill Side Slope %	Construction Category					
	CC1	CC2	CC3	CC4	CC5	CC6
0-4	27.3	36.2	59.9	85.8	108.1	123.4
5-14	28.3	37.9	63.1	90.3	113.6	129.5
15-24	29.6	40.0	67.0	95.7	120.1	136.8
25-34	30.7	42.0	70.7	100.8	126.3	143.7
35-44	31.7	43.8	74.2	105.7	132.2	150.3
45-54	32.6	45.5	77.5	110.3	137.9	156.3
55-64	33.4	47.2	80.8	114.8	143.3	162.6
65-74	34.2	48.8	83.9	119.1	148.5	168.4
75-84	35.0	50.3	86.8	123.3	153.6	174.1
85-94	35.6	51.8	89.7	127.3	158.4	179.5
95-104	36.3	53.2	92.5	131.1	163.2	184.9
105-114	36.8	54.6	95.2	134.9	167.8	190.0
115-124	37.4	55.9	97.8	138.5	172.2	195.1
125-134	37.9	57.2	100.4	142.1	176.6	200.0
135-144	38.4	58.4	102.8	145.5	180.8	204.8
145-150	38.8	59.6	105.3	148.9	185.0	209.5

b) OTHER RMC's						
Uphill Side Slope %	Construction Category					
	CC1	CC2	CC3	CC4	CC5	CC6
0-4	27.3	34.0	51.9	72.0	89.6	101.9
5-14	28.3	35.5	54.5	75.5	93.9	106.6
15-24	29.6	37.3	57.6	79.7	98.9	112.2
25-34	30.7	39.0	60.6	83.7	103.7	117.5
35-44	31.7	40.6	63.4	87.5	108.3	122.6
45-54	32.6	42.1	66.0	91.1	112.7	127.5
55-64	33.4	43.5	68.6	94.6	116.9	132.1
65-74	34.2	44.9	71.0	97.9	120.9	136.7
75-84	35.0	46.2	73.3	101.2	124.8	141.0
85-94	35.6	47.4	75.6	104.2	128.5	145.2
95-104	36.3	48.6	77.8	107.2	132.2	149.3
105-114	36.8	49.7	79.9	110.1	135.7	153.3
115-124	37.4	50.8	81.9	112.9	139.2	157.2
125-134	37.9	51.9	83.9	115.7	142.5	161.0
135-144	38.4	52.9	85.8	118.3	145.8	164.7
145-150	38.8	53.9	87.7	120.9	149.0	168.3

5.3.3.2 Bridges and Culverts

1. A cost estimate for a bridge or a culvert may only be made and used in the appraisal or reappraisal of a cutting authority area where its necessity is substantiated by field data.
2. Crib back-fills and all site preparation and bridge protection features are included, as well as material supply and erection. Except where noted below, no adjustment of table values is permitted.
3. Input data within table boundaries is rounded to fit; no interpolation of values is permitted.

5.3.3.2.1 Log Bridges

1. Cost estimates for log bridges are based on span lengths (distance between the centres of the top sill logs) and average crib height (distance from the bottom of the bottom sill log to the point where the stringer rests on the top sill log as measured along the centre line of the bridge) from Table 5-3. The average crib height is the numerical average of the crib heights on both banks of the water course.
2. Table 5-3 is used for estimating costs of all timber-decked and gravel surfaced log bridges with span lengths from 3.5 to 20.4 m and crib heights from single log to 5.4 m.

Table 5-3: Log Bridge Cost Estimates Expressed in Thousands of Dollars

Span Length (m)	Single Log Sill	Multi-Log Crib Average Crib Height (m)				
	1	2	3	4	5	
4	2.0	5.5	10.5	15.5	20.5	
5	2.3	7.3	12.4	17.4	22.4	
6	4.2	9.2	14.2	19.3	24.3	
7	6.1	11.1	16.1	21.1	26.2	
8	7.9	13.0	18.0	23.0	28.0	
9	9.8	14.8	19.9	24.9	29.9	
10	11.7	16.7	21.7	26.7	31.8	
11	13.5	18.6	23.6	28.6	33.6	
12	15.4	20.4	25.5	30.5	35.5	
13	17.3	22.3	27.3	32.4	37.4	
14	19.2	24.2	29.2	34.2	39.3	
15	21.0	26.1	31.1	36.1	41.1	
16	22.9	27.9	32.9	38.0	43.0	
17	24.8	29.8	34.8	39.8	44.9	
18	26.6	31.7	36.7	41.7	46.7	
19	28.5	33.5	38.6	43.6	48.6	
20	30.4	35.4	40.4	45.5	50.5	

5.3.3.2.2 Permanent or Portable Bridges

1. Cost estimates for permanent or portable bridges, built of any material except logs, are based on total span length and average abutment height (distance from the ground surface interface to the bottom contact point with the girders) from Table 5-4. Each bridge abutment must be measured at the mid-point, from the ground surface interface to the bottom contact point with the girders. Each measured abutment height is then added together and averaged to get a resultant abutment height.
2. Table 5-4 is used for estimating costs of permanent or portable bridges with span lengths from 2 to 30.4 m and abutment heights from 0 to 10.4 m.
3. Table 5-4 includes costs for supervision, design, site preparation, supply and installation, freight and haulage (excluding barging), and rip-rap to flood design. Barging costs are allowed as an add-on to the tabular cost estimate. If the barging of bridge materials is done in conjunction with other equipment/materials, then the cost of barging the bridge material should be prorated by the licensee. This table covers any bridge with L60 to L165 load rating.
4. Table 5-4 does not apply to:
 - a. Multi-span bridges: A construction estimate form must be completed.
 - b. Pile driving: Where piles may be driven to depths of 13 m or more, a construction estimate form must be completed for the bridge construction.
 - c. Portable bridges that are reused (see section 5.3.1).
 - d. Cost estimates for bridge sizes outside the table limits and pipe culverts greater than the aforementioned sizes require non-tabular cost estimates completed in accordance with section 5.3.4.
 - e. Extra width bridges with one or more additional stringers and/or deck panels installed (i.e., exceeding 4.9 metres in total width between guardrails measured at mid-span).

Table 5-4: Permanent/Portable Bridge Cost Estimates Expressed in Thousands of Dollars

Span Length (metres)	Abutment Height (metres)										
	0	1	2	3	4	5	6	7	8	9	10
2	10.9	13.5	16.2	18.8	21.5	24.2	26.8	29.5	32.1	34.8	37.4
3	16.3	19.0	21.6	24.3	26.9	29.6	32.3	34.9	37.6	40.2	42.9
4	21.8	24.4	27.1	29.7	32.4	35.0	37.7	40.3	43.0	45.7	48.3
5	27.2	29.9	32.5	35.2	37.8	40.5	43.1	45.8	48.4	51.1	53.8
6	32.6	35.3	37.9	40.6	43.3	45.9	48.6	51.2	53.9	56.5	59.2
7	38.1	40.7	43.4	46.0	48.7	51.4	54.0	56.7	59.3	62.0	64.6
8	43.5	46.2	48.8	51.5	54.1	56.8	59.4	62.1	64.8	67.4	70.1
9	49.0	51.6	54.3	56.9	59.6	62.2	64.9	67.5	70.2	72.9	75.5
10	54.4	57.0	59.7	62.4	65.0	67.7	70.3	73.0	75.6	78.3	81.0
11	59.8	62.5	65.1	67.8	70.5	73.1	75.8	78.4	81.1	83.7	86.4
12	65.3	67.9	70.6	73.2	75.9	78.5	81.2	83.9	86.5	89.2	91.8
13	70.7	73.4	76.0	78.7	81.3	84.0	86.6	89.3	92.0	94.6	97.3
14	76.1	78.8	81.5	84.1	86.8	89.4	92.1	94.7	97.4	100.1	102.7
15	81.6	84.2	86.9	89.6	92.2	94.9	97.5	100.2	102.8	105.5	108.1
16	87.0	89.7	92.3	95.0	97.6	100.3	103.0	105.6	108.3	110.9	113.6
17	92.5	95.1	97.8	100.4	103.1	105.7	108.4	111.1	113.7	116.4	119.0
18	97.9	100.6	103.2	105.9	108.5	111.2	113.8	116.5	119.2	121.8	124.5
19	103.3	106.0	108.7	111.3	114.0	116.6	119.3	121.9	124.6	127.2	129.9
20	108.8	111.4	114.1	116.7	119.4	122.1	124.7	127.4	130.0	132.7	135.3
21	114.2	116.9	119.5	122.2	124.8	127.5	130.2	132.8	135.5	138.1	140.8
22	119.7	122.3	125.0	127.6	130.3	132.9	135.6	138.3	140.9	143.6	146.2
23	125.1	127.8	130.4	133.1	135.7	138.4	141.0	143.7	146.3	149.0	151.7
24	130.5	133.2	135.8	138.5	141.2	143.8	146.5	149.1	151.8	154.4	157.1
25	136.0	138.6	141.3	143.9	146.6	149.3	151.9	154.6	157.2	159.9	162.5
26	141.4	144.1	146.7	149.4	152.0	154.7	157.4	160.0	162.7	165.3	168.0
27	146.9	149.5	152.2	154.8	157.5	160.1	162.8	165.4	168.1	170.8	173.4
28	152.3	154.9	157.6	160.3	162.9	165.6	168.2	170.9	173.5	176.2	178.9
29	157.7	160.4	163.0	165.7	168.4	171.0	173.7	176.3	179.0	181.6	184.3
30	163.2	165.8	168.5	171.1	173.8	176.5	179.1	181.8	184.4	187.1	189.7

5.3.3.2.3 Culverts

1. All pipe culverts up to and including 0.9 m diameter and all single log abutment culverts up to 3.4 m span length are included in the subgrade cost estimates.
2. Costs for culverts 1.0 m diameter to 1.8 m diameter are estimated using Table 5-5. Culverts less than 1.0 m diameter shown in Table 5-5 are for use in non-tabular estimates only. Culverts greater than 2.0 m diameter require a non-tabular cost estimate completed in accordance with section 5.3.4.

Table 5-5 Culvert Cost Estimate

Diameter (m)	Cost per lineal metre	Diameter (m)	Cost per lineal metre
0.3	\$42.00	0.9	\$118.00
0.4	\$49.00	1.0	\$169.00
0.5	\$67.00	1.2	\$207.00
0.6	\$83.00	1.4	\$253.00
0.7	\$95.00	1.6	\$348.00
0.8	\$106.00	1.8	\$400.00

5.3.3.3 Additional Stabilizing Material

1. Stabilizing material is gravel or broken rock which is placed on the road subgrade to provide stable support and a running surface for logging related equipment. Some stabilizing material may be created on site during subgrade construction. If additional stabilizing material is required it may be obtained from the adjacent cut-bank or trucked in.

5.3.3.3.1 Stabilizing Cost Estimate

1. The total cost estimate per kilometre for the stabilizing material is:

$$\text{Cost Estimate (\$/km)} = V \text{ multiplied by } U$$

Where:

- a. V is the loose volume of additional stabilizing material expressed in cubic metres of material per kilometre of road, and

- b. U is the cost estimate of the additional stabilizing material expressed in dollars per loose cubic metre of material.
- 2. The volume of rock or gravel expressed in cubic metres required to stabilize one kilometre of road which includes the length of turnouts and landings is calculated as follows:
 - a. Where rock is used, $VR = 1000D (W + 1.0D)$,
 - b. Where gravel is used, $VG = 1000D (W + 1.5D)$,

Where:

- i. W is the stabilized road width and has the value of 6.2 metres,
- ii. D is the loose depth of stabilizing material measured in metres determined from the table 5-6,
- iii. VR is the volume of **rock**, and
- iv. VG is the volume of gravel.

Table 5-6: Additional Loose Stabilizing Material Depths expressed in metres

Side Slope	Construction Category					
	1	2	3	4	5	6
0-4	0.8	0.8	0.7	0.6	0.6	0.5
5-14	0.7	0.7	0.7	0.6	0.5	0.4
15-24	0.7	0.6	0.6	0.5	0.4	0.4
25-34	0.6	0.6	0.5	0.4	0.3	0.3
35-44	0.5	0.5	0.4	0.3	0.3	0.2
45-54	0.4	0.4	0.3	0.3	0.2	0.1
55-64	0.3	0.3	0.3	0.2	0.1	0.0
65-74	0.2	0.2	0.2	0.1	0.0	0.0
75-84	0.2	0.1	0.1	0.0	0.0	0.0
85-94	0.1	0.1	0.0	0.0	0.0	0.0
95-104	0.0	0.0	0.0	0.0	0.0	0.0
105-114	0.0	0.0	0.0	0.0	0.0	0.0
115+	0.0	0.0	0.0	0.0	0.0	0.0

5.4 Road Maintenance Cost

1. A road maintenance cost may be used in the calculation of a tenure obligation adjustment to take into account the licensee's performance of the following activities:
 - a. grading,
 - b. brush control,
 - c. minor surfacing repairs,
 - d. sanding,
 - e. snowplowing,
 - f. ditch maintenance and repair,
 - g. replacement of culverts ≤ 0.9 m on active roads,
 - h. slough removal,
 - i. deactivation,
 - j. minor repairs to roads due to slides, erosion and flood damage,
 - k. road use charges except those described in section 5.5.
2. A road maintenance cost may only be included in the calculation of a tenure obligation adjustment for those parts of a cutting authority area where the logs will be transported over a road by truck.
3. Where the cutting authority area is located in the Sunshine Coast, Squamish, Campbell River, Chilliwack or South Island Forest District, the road maintenance cost is \$1.58/m³.
4. Where the cutting authority area is located in the Queen Charlotte, North Coast or North Island - Central Coast Forest District, the road maintenance cost is \$2.02/m³.

5.5 Road Use Charges

1. A road use charge may be used in the calculation of a tenure obligation adjustment, if:
 - a. the road to which the road use charge applies is required to transport logs from the cutting authority area to the appraisal log dump,
 - b. the road use charge is not referred to in subsection 2, or 3a or 3b of this section,
 - c. the licensee submits to the district manager with the appraisal data submission:
 - i. a completed Request for Approval of a Road Use Charge Form,
 - ii. a map showing the location of the road and a copy of the written road use agreement, and
 - iii. written confirmation by the regional manager that the road use charge specified in the application, or an amount specified by the regional manager is approved, and
 - d. the term of the road use agreement is completely within the period for which the appraisal shall apply, and
 - e. the licensee promises in writing to submit a copy of every auditable monetary transaction evidencing payment by the licensee for road use when that is requested by the regional manager.
2. Charges as a Share of Road Maintenance
 - a. These charges may not be included in an appraisal or reappraisal.
3. Miscellaneous Road Charges
 - a. Forest Service Roads

No road use charges with respect to a road that is declared, determined, built, maintained or modified by the ministry, may be included in an appraisal or reappraisal;
 - b. Permitted Road

No road use charges for roads built on Crown land, authorized by road permit or any other cutting authority document may be included in an appraisal or reappraisal;

c. Other Roads

No road use charge for a road on an Indian reserve or on private land owned by a third party at arm's length and not subject to a lease held by the licensee, its affiliate or agent of either the licensee or the third party, may be included in an appraisal or reappraisal unless there is no route capable of being built at a lower cost through Crown land and the charges are reasonable, do not exceed compensation that might be determined under the forest legislation, and are proven through the presentation of auditable documents.

4. Land Use Charges

No land use charges may be considered in an appraisal or a reappraisal.

5.6 Basic Silviculture Cost

1. Except where basic silviculture performed or to be performed on a cutting authority area is or will be funded by the Crown or an agent of the Crown a basic silviculture cost may be used in the calculation of a tenure obligation adjustment where the licensee is required to perform basic silviculture on the cutting authority area being appraised or reappraised.
2. The basic silviculture cost depends on the geographic location of the cutting authority area being appraised or reappraised as described in table 5-7.

Table 5-7: Basic Silviculture Cost

Where the cutting authority area is located in:	The basic silviculture cost expressed in \$/m ³ is:
Queen Charlotte Island Forest District	3.09
Chilliwack Forest District	4.42
Squamish Forest District	2.69
Sunshine Coast Forest District	3.38
South Island Forest District	2.73
Campbell River Forest District	2.16
North Island - Central Coast Forest District	2.49
North Coast Forest District	3.42

7.6 Miscellaneous Stumpage Rates

Unless otherwise specified in a cutting authority, the stumpage rates for special forest products, deciduous species, low grade logs and timber in specified areas listed in Table 7-1, are listed in Table 7-1.

7.6.1 Special Forest Products and Other Miscellaneous Rates

Table 7-1 shall be used for determining stumpage rates for the specified products from all sources of Crown timber. The table in effect on the date of scale shall be used to determine the stumpage rate.

7.6.2 Marine Log Salvage

7.6.2.1 Beachcomb

A beachcomb rate may apply to logs salvaged in the Vancouver log salvage district under Part 9 of the *Act*, and stray logs salvaged elsewhere in coastal waters.

The stumpage rate for beachcomb is listed in table 7-1.

7.6.2.2 Root Buck

A root buck rate may apply to any species where the roots are attached at the time stray logs are salvaged in coastal waters. Excludes logs salvaged from coastal waters within the boundaries of the North Coast and Kalum Forest Districts.

The rate for root buck is listed in table 7-1.

7.6.2.3 Wahleach Island Catchment Basin

The stumpage rate for logs salvaged at Wahleach Island catchment basin operated by B.C. Debris Control Board is listed in table 7-1.

7.6.2.4 Deadhead Logs

A deadhead rate may apply to deadhead logs as defined in the log salvage regulation, salvaged in coastal waters and subject to scaling requirements under part 6 of the *Act*.

The stumpage rate for deadhead logs is listed in table 7-1.

Table 7-1: Miscellaneous Stumpage Rates

Coniferous Species	Code	Product	Stumpage Rate
Cedar	SK	Shakes	\$ 6.00/m ³
Cedar	PR	Fence Posts and Rails	\$ 3.00/m ³
Cedar	MT	Mining Timbers	\$ 3.00/m ³
All Species	SB/LB	Blanks/Bolts/Blocks	\$ 5.30/m ³
All Species	SS	Stakes and Sticks	\$ 1.20/m ³
All Species (except Cedar)	PR	Fence Posts and Rails	\$ 1.20/m ³
All Species	CA	Cants	\$ 9.60/m ³
Deciduous		All (except grades Y, Z)	\$ 1.00/m ³
Yew		All	\$ 0.25/m ³
All Species		Grade Y	\$ 0.25/m ³
All Species	FW	Firewood	\$ 1.00/m ³
All Species	XM	Christmas Trees: less than 3m 3 to 5m More than 5m	\$ 0.20 each \$ 1.00 each \$ 1.50 each
All Species	BC	Beachcomb	\$ 0.70/m ³
All Species	RB	Root buck	\$7.80/m ³
All Species	DH	Wahleach Island catchment basin	\$ 0.25/m ³
All Species	DH	Deadhead logs	\$ 0.25/m ³

Cants are produced from dead and down post logging material that would not make a sawlog as determined by the regional manager.

Index

A

Additional Stabilizing Material, 5-17
Annual Reappraisal of a Road Permit, 3-7
Appendices, A-1
Appraisal Data Submission, 2-7
Appraisal Map, 2-8
Appraisal Methodology, 4-2
Appraisals, 3-3
Average Stumpage Rates by District and Species, 3-10, 7-2

B

Basic Silviculture Cost, 5-26
Beachcomb, 7-9
Billing History Record, 4-6
Bridge Cost Estimates, 5-7
Bridges and Culverts, 5-14

C

Calculation Conventions, 2-3
Capping, 5-20
Changed Circumstance Reappraisal Procedure, 3-6
Changed Circumstances, 3-5
Clayoquot Sound Operating Costs, 4-21
Coniferous Timber, 4-5
Correctable Errors, 3-11
Cruise Information, 2-5
Culverts, 5-17
Cutblocks within a Cutting Authority Area, 2-3
Cutting Authority Area With Not More than 2 500 m³ of Timber Volume, 7-3

D

Damaged Timber, 4-12
Data Requirements, 5-21
Deadhead Logs, 7-9
Decked Timber, 7-6
Definitions and Interpretations, 1-2
Detail Engineered Road Cost Estimates, 5-6
Development Cost Allocation, A-5

E

Effective Date of Changed Circumstance Reappraisal, 3-6
Estimated Number of Bidders (ENB) Equation, 4-18
Estimated Winning Bid (EWB) Equation, 4-18
Existing Roads, 5-9
Extended Road Amortization, 5-9

F

Final Estimated Winning Bid, 4-22
Fixed Rates and Extensions of Term, 3-9
Forest Planning and Administration Cost, 5-3

H

Helicopter Single Standing Stem Selection, 4-21

I

Indicated Rate (IR), 6-4
Indicated Upset Stumpage Rate (IUSR), 6-2
Inland Water Transportation, 4-19

L

Log Bridges, 5-14
Log Grade Percentage Criteria, 4-7
Log Grade Percentages, 4-6
Log Selling Prices, 4-5
Low Volume Cost, 5-3

M

Marine Log Salvage, 7-9
Marine Log Transportation, 4-14
Market Logger Road Cost, 5-28
Market Price, 6-3, 6-4
Market Pricing System (MPS) Variables, 4-3
Market Stumpage Rate, 6-2
Minister's Direction, 3-7
Minister's Direction Reappraisal Procedure, 3-7
Miscellaneous Stumpage Rates, 7-9

N

New Road Construction, 5-6
Non-tabular Cost Estimates, 5-20

O

Order-in-Council, 3-2

P

Permanent/Portable Bridges, 5-15
Point of Appraisal, 4-14
Prescribed Minimum Stumpage Rate, 6-2, 6-4

Q

Quarterly Adjustments, 3-8

R

Reappraisals, 3-5
Reconstruction and Replacement, A-4
Responsibility for Stumpage Determinations, 2-2
Return to Forest Management, 5-29
Road Development Cost, 5-4
Road Development Cost Proration, 5-5
Road Maintenance Cost, 5-23
Road Permits, 7-4
Road Reconstruction, 5-7
Road Use Charges, 5-24
Rock Mass Classification, 5-10

Root Buck, 7-9

S

Salvage Logging Stumpage Rates, 7-7
Second Growth Coniferous Timber, 4-21
Skyline, 4-19
Source of Log Grade Percentage for Each Cutting Authority, 4-9
Special Forest Products, 7-9
Specified Operations, 4-19
Stand Selling Price, 4-12
Stand Selling Price Calculation, 4-12
Stumpage Rate, 6-4
Stumpage Rate Calculation for a Cutting Authority Entered into Under Section 20 of the Act, 6-2
Stumpage Rate Calculation for a Cutting Authority Other than a Cutting Authority Entered into Under Section 20 of the Act or a Cutting Authority for which a Stumpage Rate is Determined Under Chapter 7, 6-4
Subgrade Construction, 5-10
Subgrade Cost Estimates, 5-11

T

Tabular Cost Estimates, 5-9
Tabular road cost estimates, 5-6
Tenure Obligation Adjustment, 5-2, 5-30
Terms of Reference, 2-2
Timber Licence, 3-10
Timber Sale Licences, 3-9
Total Volume of less than 2 500 m³, 7-3
Towing or Barging, 4-15
Towing Points of Origin, 4-16
Tree Crown Modification, 4-20
Tributary, 5-4
Truck Hauling, 4-14
Types of Determination, 3-2

U

Upset Stumpage Rate, 6-2

W

Wahleach Island Catchment Basin, 7-9