HEART ROT 3

3.0 Heart Rot Deduction Methods

1. Decayed heart wood may be visible at one or both ends of a log and will usually be circular or semicircular in shape. Its presence may be indicated by rotten knots, or "conk". Frost checks, catface and scars may be used as indicators to estimate the length the rot travels.

2. If heart rot appearing at the end of a log is scattered or sporadic in nature, the cylinder of rot must be reduced in diameter to accommodate the firmwood scattered within the rot.

3.1 Heart Rot Visible at Both Ends

1. If rot is visible at both ends of the log, scale out the cylinder of rot as if it were a log inside the first log. The volume of the inner cylinder is the volume of the rot.

2. If rot is visible at both ends of the log, they are presumed connected unless there are indications to the contrary. For example, if different types of rot show at the ends, they may not be connected.

3.2 Heart Rot Visible at One End Only

1. Heart rot, pocket rot, ring rot, and similar defects when showing in only one end of the log are presumed to run half the length of the log to a maximum of 6 metres, unless there is evidence to the contrary. In all cases, good judgement must be used. Where local experience indicates otherwise, Yukon Forest Management Branch may order that this maximum be reduced. Local experience is gained by observation of the bucking and manufacturing process.

2. In heart defects with only one end visible, the diameter of the defect at the unseen end is assumed to be the same as at the measured end where the defect penetrates 1/2 way or less. However, in logs where the rot penetrates more than 1/2 way, this assumption is less reasonable, and Yukon Forest Management Branch may order that logs be bucked prior to scaling to improve accuracy. If bucking is impossible, the ratio of the area of the rot to the area of the end which the rot occurs must be maintained at the unseen end, or an over deduction will result. A shortcut method to calculate a length deduction where the defect is estimated to penetrate more than 1/2 way is:

$$\frac{\text{Unit Volume rot}}{\text{Unit Volume log end}} \text{ x length of rot} = \text{length deduction}$$

Figure 3.1 Various stages of heart rot

Figure 3.2 Heart rot with white speck

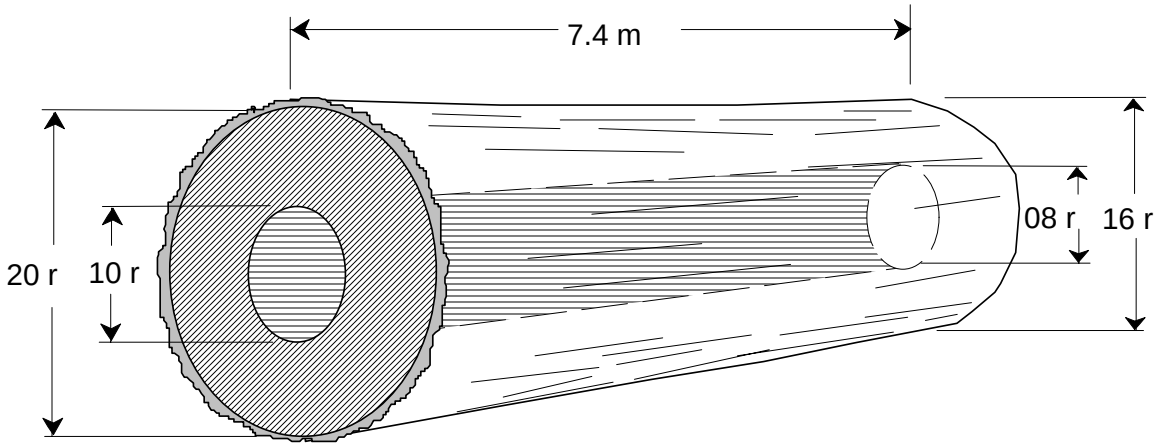
3.3 Heart Rot (Cylindrical Defects)

This method of calculation can be used for defects that have the geometrical shape of a cylinder.

This formula or combinations of this formula are used for calculating volumes of the following defects, through running heart defect, heart defect running partial length of a log, conk defect, catface, sapwood defect, dead side, ring defect, and defective portions of collars.

3.3.1 Example and Illustration - Heart Rot, Full Length

Heart rot extends completely through the log and is measurable at both ends.



A log with through-running heart rot.

3.3.2 Heart Rot - Through Running

The essential measurements required to arrive at rot volumes are:

- The defect length in metres to the nearest tenth of a metre, (the same as the measured log length), and
- Both defect end diameters in rads.

3.4 Field Calculation - Length Deduction

To reduce the recorded length measurement of the log to create a log with net dimensions equal to the net volume in the example, follow these steps:

With the scale stick, look up the volume of a cylinder of the diameter and length of the defect by adding the:

Top defect half volume:

Half volume of 7.0/08	=	70 dm^3
Half volume of 0.4/08	=	+ 4 dm^3
Half volume of 7.4/08	=	74 dm^3

Butt defect half volume:

Half volume of 7.0/10	=	110 dm^3
Half volume of 0.4/10	=	6 dm^3
Half volume of 7.4/10	=	116 dm^3
Full defect volume of 7.4/08/10	=	(74 + 116) = 190 dm^3

Calculate the average unit volume for the log by adding the ten metre half volumes of the end measurements of the log and dividing by ten.

Half volume of 10.0/16	=	402 dm^3
Half volume of 10.0/20	=	+ 628 dm^3
Full volume of 10.0/30/38	=	1030 dm^3
Full volume of 1.0/30/38	=	103 dm^3

Calculate the length deduction by dividing the defect volume by the average unit volume (the sum of the top one metre half volume and the butt one metre half volume) of the log:

$$\frac{190}{103} = 1.84 \text{ m}$$

The length deduction rounded is 1.8 m.

Calculate the net length by subtracting the length deduction from the gross length of the log.

7.4 - 1.8 = 5.6 m

Net Volume = 0.564 m^3 or 564 dm^3

Record the net dimensions as:

Length	Top	Butt
056	16	20

3.5 Field Calculation - Diameter Deduction

Using unit volumes off the scale stick, find the unit volume for the top end measurement and subtract the unit volume of the defect.

Unit volume, top (16 r)	=	80 dm^3
Less the unit volume, top defect (8 r)	=	– 20 dm^3
Net unit volume	=	60 dm^3

Find the rad class corresponding closest to the unit volume of 60 dm^3, which is 14 rads.

Calculate the unit volume for the butt end measurement and subtract the unit volume of the butt end defect.

Unit volume Butt (20 r)	=	126 dm^3
Less unit volume Butt defect (10 r)	=	– 31 dm^3
Net unit volume	=	95 dm^3

Find the rad class corresponding closest to the unit volume of 95 dm^3, which is 17 rads.

The volume corresponding to the net dimensions of 7.4 m by 14 r by 17 r is 565 dm^3.

Record the net dimensions as:

Length	Top	Butt
074	14	17

> Use the diameter or radius deduction method only if heart defect or hole runs the full length or exactly half the length of the log.

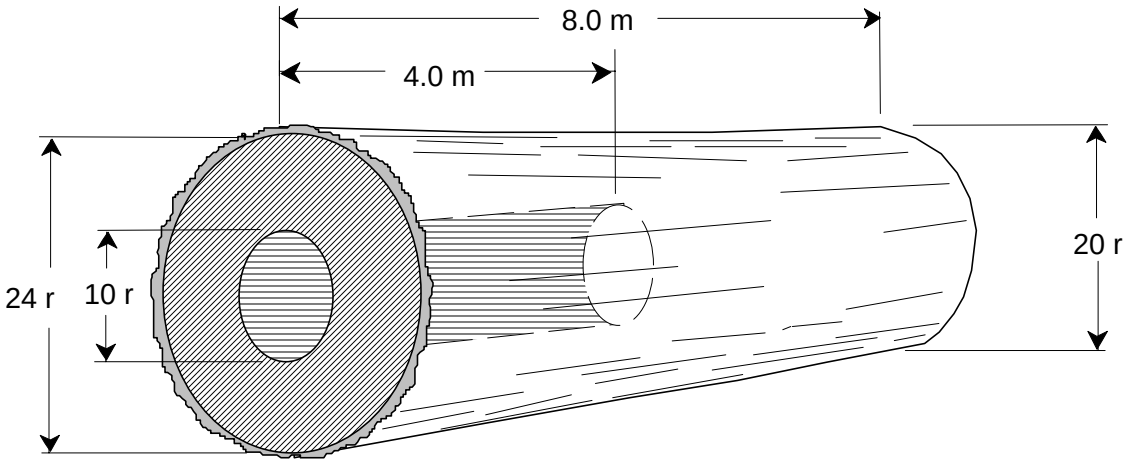
3.6 Heart Rot - Partial Length of Log

The essential measurements required to arrive at rot volumes are:

- The estimated defect length in metres to the nearest tenth of a metre.
- The defect diameter visible at the log end in rads.

Example and Illustration - Heart Rot, Partial Length

The heart rot visible at the top end of the log shown is estimated to travel 4.0 m and the diameter of the rot is assumed to be the same at both ends (10 rads). Although not demonstrated in this example, the diameter deduction method may be used if rot is assumed to travel exactly half-way or is through running.



A log with partial length heart rot.

3.7 Field Calculation - Length Deduction

To reduce the recorded length measurement of the log to create a log with net dimensions equal to the net volume in the example, follow these steps:

Top defect volume

Half volume of 4.0/10 = 63 dm^3

Full volume of 4.0/10/10 = 126 dm^3 (2 x the half volume)

Calculate the average unit volume for the log by adding the ten metre half volumes of the end measurements of the log and dividing by ten.

Half volume of 10.0/20	=	628 dm^3
Half volume of 10.0/24	=	+ 905 dm^3
Full volume of 10.0/20/24	=	1533 dm^3
Full volume of 01.0/20/24	=	153 dm^3

Calculate the length deduction by dividing the defect volume by the average unit volume of the log:

$$\frac{126}{153} = 0.824 \text{ m}$$

The length deduction rounded is 0.8 m.

Calculate the net length by subtracting the length deduction from the gross length of the log.

8.0 m - 0.8 m	=	7.2 m
Net Volume	=	1.104 m^3 or 1104 dm^3

Record the net dimensions as:

Length	Top	Butt
072	20	24