RING ROT 5

5.0 Ring Rot

Ring rot differs from heart rot in that it develops in narrow, circular bands or strips, as evidenced in figures 5.1 and 5.2, as opposed to broader circular sections.

Figure 5.1 Ring rot encompassing approximately 45% of the log circumference

Figure 5.2 Ring rot in various stages on the collar, heart rot in the centre

5.1 Ring Rot Deduction Methods

1. Ring rot often does not form a complete circle. The volume should be calculated as if it were a full circle, then a factor of the circumference of the ring divided by the full circle is applied to obtain the true volume. That is, if the ring travels approximately two thirds of the way around its circumference, the "unit volume" or factor of the ring area is also two thirds of what a full circle of rot would be.

2. If there is more than one ring of rot, the firmwood deduction is taken progressively, from the outside rings to the inside rings.

3. When estimating the distance that ring rot travels down a log, use the same methods as used in the heart rots, or conk rot, if there is evidence of conk.

Figure 5.3 Ring rot encompassing approximately 50% of the circumference

Figure 5.4 Ring rot encompassing 100% of the circumference of the log

5.1.1 Ring Rot - Through Running

Ring rot does not always form a full circle. The simplest method of determining the volume of a ring that does not form a full circle is to:

1. Apply the methods described below as if it were a full circle.
2. Estimate the arc of the rot as a percentage of the full circle.
3. Apply this percentage factor to the full circle.

The result is the net volume of the partial ring.

The essential measurements required to calculate ring rot volumes, where the defect runs the full length of the log, are:

- The defect length in metres to the nearest tenth of a metre (the same as the measured log length),
- The outside diameter of the ring defect at the top end in rads,
- The inside diameter of the ring defect at the top end in rads,
- The outside diameter of the ring defect at the butt end in rads, and
- The inside diameter of the ring defect at the butt end in rads.

5.1.2 Example and Illustration - Ring Rot, Full Length

In the example, a fungus has caused a ring shaped rot to destroy the wood fibres for the full length of the log. The rot volume may be visualised as a cylinder of rot containing another, smaller, cylinder of firmwood that is subtracted from the rot cylinder, leaving the volume of the ring.

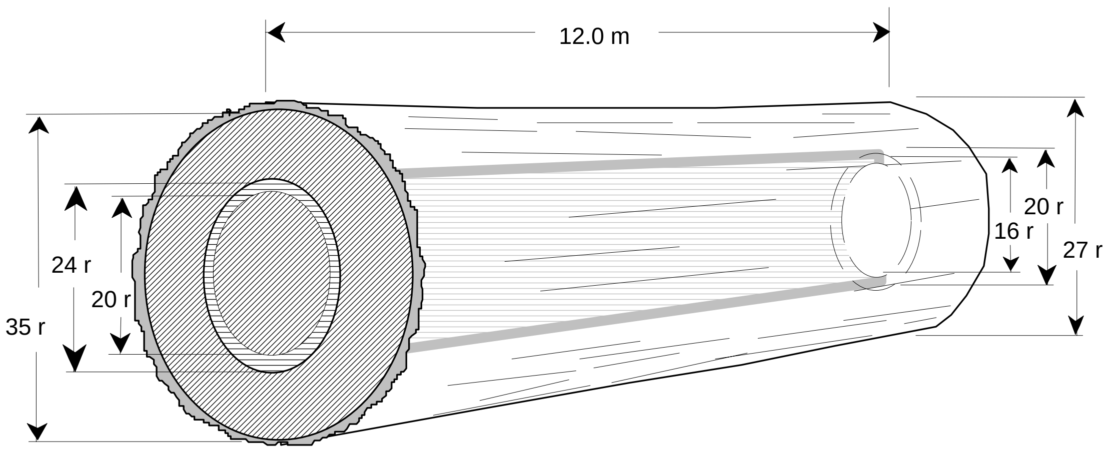

Figure 5.5 A log with through-running ring rot

5.1.3 Ring 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 outside diameter of the ring defect visible at the log end in rads, and
- The inside diameter of the ring defect visible at the log end in rads.

5.1.4 Example and Illustration - Ring Rot, Partial Length

Ring rot is visible at only one end of the log. Because there are no other indicators, the rot is estimated to travel one half the length of the log and the ring's inner and outer diameters are assumed to be the same at both ends. See example in figure 5.6.

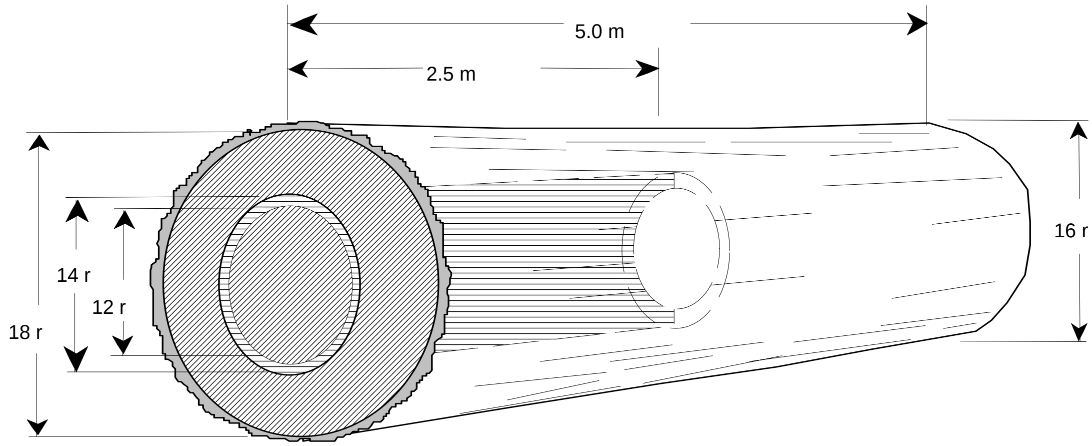

Figure 5.6 A log with partial length ring rot

To reduce the gross length of the log to create a log with net dimensions equal to the net volume in the above example:

Calculate the volume of the defect using the outside and inside diameters of the defect.

Outside diameter cylinder volume:

Half volume of 020/14	=	62 dm^3
Half volume of 005/14	=	+ 15 dm^3
Half volume of 025/14	=	77 dm^3
Full volume of 025/14	=	154 dm^3 (2 x half volume)

Inside diameter cylinder volume:

Half volume of 020/12	=	45 dm^3
Half volume of 005/12	=	+ 11 dm^3
Half volume of 025/12	=	56 dm^3
Full volume of 025/12	=	112 dm^3 (2 x half volume)

Volume of defect equals outside diameter cylinder volume minus inside diameter cylinder volume.

Defect volume = 154 - 112 = 42 dm^3

A factor may be applied at this point for a partial ring defect (i.e., if the ring arc forms only one half of the circumference, multiply the above volume by 0.5 or 50 percent).
Calculate the unit volume for the log by adding the ten metre half volumes of the end measurements of the log and dividing by 10.

Half volume of 10.0/16	=	402 dm^3
Half volume of 10.0/18	=	+ <u>509 dm^3</u>
Full volume of 10.0/16/18	=	911 dm^3
Full volume of 01.0/16/18	=	91 dm^3

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

$$\frac{42}{91} = 0.46 \text{ m}$$

The length deduction is rounded to 0.5 m.

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

5.0 m - 0.5 m	=	4.5 m
Net Volume	=	0.410 m^3 or 410 dm^3

Record the net dimensions as:

Length	Top	Butt
045	16	18

5.1.5 Field Calculation - Length Deduction

Three steps are required for a ring defect deduction. Using the same methods as for heart rot:

1. Find a volume using the outside diameters and length of the ring.
2. Find the volume of the sound core using the inside diameters of the ring.
3. Subtract the volume of the sound core to get the volume of the outside ring (Step 2 minus Step 1).

To reduce the gross length of the log to create a log with net dimensions equal to the net volume in the above example:

Calculate the volume of the defect using the outside and inside diameters of the defect.

Outside diameter cylinder volume:

Half volume of 12.0/24	=	1086 dm^3
Half volume of 12.0/20	=	+ 754 dm^3
Full volume of 12.0/20/24	=	1840 dm^3

Inside diameter cylinder volume:

Half volume of 12.0/20	=	754 dm^3
Half volume of 12.0/16	=	+ 483 dm^3
Full volume of 12.0/20/24	=	1237 dm^3

Volume of defect equals outside cylinder volume minus inside cylinder volume.

Defect volume = 1840 - 1237 = 603 dm^3

A percentage factor may be applied at this point for a partial ring defect (i.e., if the ring arc forms only one third of the circumference, multiply the above volume by 0.33 or 33 percent).

Calculate the unit volume for the log by adding the ten metre half volumes of the end measurements of the log and dividing by 10.

Half volume of 10.0/27	=	1145 dm^3
Half volume of 10.0/35	=	+ 1924 dm^3
Full volume of 10.0/27/35	=	3069 dm^3
Full volume of 01.0/20/24	=	307 dm^3

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

$$\frac{603}{307} = 1.964 \text{ m}$$

The length deduction rounded is 2 m.

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

Net Length	=	12 m - 2 m = 10 m
Net Volume	=	3.069 m^3 or 3069 dm^3

Record the net dimensions as:

Length	Top	Butt
100	27	35