GENERAL REWRITE – PLEASE READ CAREFULLY.

WOOD SAMPLING INSTRUCTIONS

PHYSICAL INSPECTION

Examine the charge for cleanliness, mechanical damage to individual pieces, and treatment damage such as severe checking, splitting or honeycombing. Inspect the shipment to ensure all required marks and stamps are on the material, as well as ensure all proper documentation is in order.

TREATED WOOD SAMPLING

A sample shall consist of a minimum of twenty cores per charge/treatment type.

Boring Instructions:

A. Boring shall be done with a sharp increment borer which extracts a core approximately 0.20 inch in diameter. The bit shall be kept free of rust, pitch or preservative. See the Calibrating the Increment Borer Section.

B. Lubricate the bit with Beeswax. Penetration and removal of the borer bit will be easier if beeswax is liberally applied to the threads and shank before boring.

C. Borings shall be taken at the following locations on each piece of bored wood unless otherwise specified:

   1. Pressure treated material, approximately midway between ends.

   2. Select the edge that contains the largest amount of sapwood, with at least 0.5 inch of treated sapwood. (See Sapwood vs. Heartwood Section).

   3. Red Oak over 9 feet in length - 4 feet from either end.

D. In round material (poles, piling, and posts), boring shall be toward the center of the piece. In sawn material, borings shall be taken perpendicular to the face being sampled

E. Borings shall be taken on a random basis from pieces which represent an equal proportion of the different sizes, seasoning and location of pieces in the bundles for the charge being sampled.

F. Sampling should be on a random basis so that all pieces available for sampling within a charge have an equal chance of being represented in the sample.

G. Knots, grain deviation around knots, pitch pockets, shakes, splits, irregular slope of grain and reaction wood (compression or tension) shall be avoided in selecting the exact location for the boring.

H. For incised material, borings shall be taken at a point midway on a line diagonally between adjacent incisions. When it is apparent from visual inspection that the depth and density of incisions is not uniform on all faces of sawn material, borings shall be taken from the face that has less dense or shallower incising.

I. The core shall be discarded if a borer passes through an internal defect, or if the core is crushed, or smeared with treating solution so the penetration cannot be determined.

J. Clean borer bit with WD-40. Spray WD-40 on the outside as well as the inside of the bit and on the extractor at the end of sample collection. Wipe clean. Replace cap on borer bit to protect the threads.

K. If the increment borer becomes dull or nicked, return the bit to the central lab for sharpening. A borer is dull if it does not easily engage the wood and if it will not cut a clean edged hole when rotated on a sheet of paper.

Core Handling:

The following procedure shall be used in handling increment borer cores.

A. As the increment borer penetrates the material, ensure that it is perpendicular to the surface being bored or is directed toward the center as required by the type of material.

B. Remove the core from the increment borer carefully to avoid breaking or damaging the core.

C. For material treated with CCA, ACZA, and copper Naphthenate skip to Step F. For material treated with Pentachlorophenol and Creosote, follow Steps D and E.

D. Measure the penetration of treatment to the nearest tenth of an inch of Pentachlorophenol and Creosote immediately after sampling. The depth of penetration shall be the distance from the outer end of the core. Using a ruler, measure the depth of penetration on each core to the nearest annual ring of untreated wood. Record these measurements on the Penetration of Penta & Creosote Worksheet (See Appendix E of IM 462).

E. After measuring penetration, cut the treated edge of the core to prevent the preservative from migrating into the untreated part of the core. For Douglas Fir, cut the assay zone of 0.6 in. For Southern Pine, the assay zone is 1.0 in. Do not discard the remaining portion of the core. Keep both pieces of the cores together.

F. Place the cores on the sample holding tray or in individual protective plastic containers. Do not allow cores treated with Pentachlorophenol, Copper Naphthenate or Creosote to come in contact with paper or any other absorbent material as it may extract some of the oil and preservative resulting in unreliable readings.

CALIBRATING THE INCREMENT BORER

The borer shall be calibrated at least once a month, and after sharpening.

Method 1: Calibrating New Increment Borer Bit

This method shall be used on new or unworn bits. A Starrett Taper Gage (Cat. No. 269A), or equivalent, shall be used, reading to the nearest 0.001 inch. The bit diameter shall be considered as the average of two readings. Complete the New Bit Calibration Worksheet as shown in Appendix E of IM 462.

Method 2: Calibrating by Increment Borer Cores

At least 20 borings shall be measured. Preferably this shall be done immediately after extracting each core from wood at normal temperatures. If measurements cannot be made immediately, the cores shall be placed a clean, tightly sealed container (bottle, individual containers, etc.) and they shall be measured immediately on return to the laboratory.

Only well-cut cores shall be used and care should be taken to measure at a point within the assay sampling zone (0.6 in for Douglas Fir, 1.0 in for Southern Pine), free from knots and resin accumulations.

Use a machinist's micrometer, calipers or equivalent to read the measurement to the nearest 0.001 inch. Fill out a Used Bit Calibration Worksheet (See Appendix E of IM 462).

A. Measure the diameter of each core across the grain. Record your measurement.

B. Measure the diameter of each core along the grain. Record your measurement.

C. Calculate the average of the two diameters from measurements A. and B. for each core.

D. Calculate the calibrated diameter of the borer by dividing the total sum of the average diameters by the number of cores.

SAPWOOD VS. HEARTWOOD

The heartwood in a tree is the area of growth near the heart of the tree trunk and it is very dense and very resistant to decay. The heartwood does not accept treatment and it will not absorb chemicals when treated. The sapwood is newer growth of the wood, and it is less dense and susceptible to decay. It does accept chemical treatment to prevent decay.

When a core sample of wood is tested for penetration, the amount of treatment penetration is measured in inches from the outer face of the core or as a percentage of sapwood penetration. A wood post that contains a little sapwood and more heartwood will retain less treatment but the heartwood itself will prevent decay. A post that contains more sapwood needs to have a greater

amount of treatment retention and penetration, since sapwood will decay considerably without treatment.

When sampling treated sawn wood products, the core must be taken from the edge that contains the largest amount of sapwood and towards the heart of the lumber. Figures A and B show the correct way to take a core from the sawn wood product. Before drilling a core in the wood, the inspector should look at the end of the post to decide which side will contain the least amount of heartwood. The test results for these cores will give a better indication of the amount of treatment retained by the wood product.

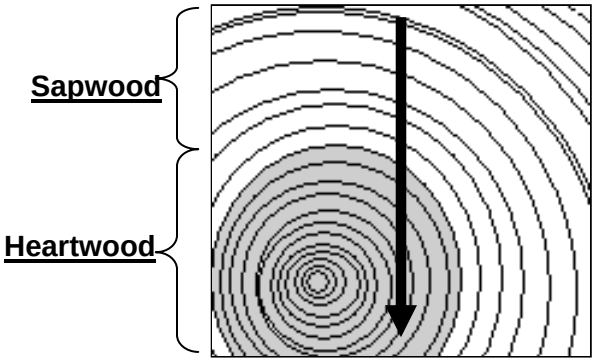

Figure A: Correct

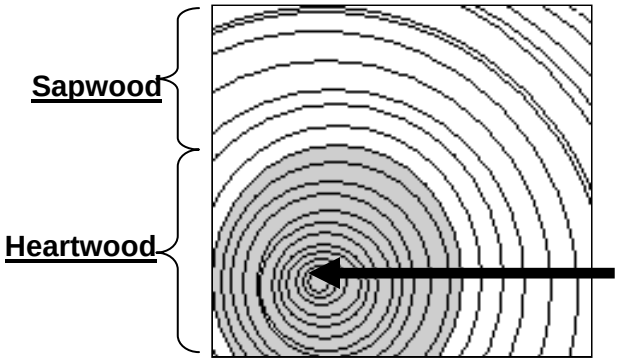

Figure B: Correct

Figures C and D show the incorrect way to drill a core from a sawn wood post. In this case, the core would be almost all heartwood and the test would result in very little preservative retained, giving a misleading result.

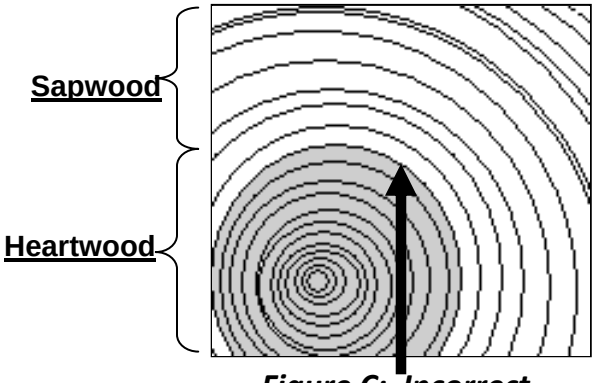

Figure C: Incorrect

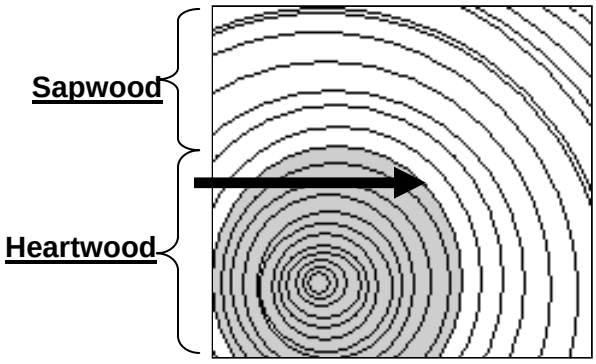

Figure D: Incorrect

For material that is round, the core should be taken perpendicular to the surface and towards the center of the post, as shown in Figure E.

Figure E: Correct

PLUGGING TEST HOLES

All increment borer holes should be promptly plugged with treated, tight-fitting wooden plugs or other material not susceptible to insect attack and decay. Wooden plugs shall be treated with a preservative similar in performance to that of the product treatment. It may not be practical to use wooden plugs for sawn material of a thickness less than two inches nominal or in plywood due to the risk of damage. Care should be used in selecting the proper diameter plugs, and in driving to avoid breaking the plug or splitting the piece.

SAMPLE IDENTIFICATION

Whether the samples are placed in individual protective containers or in sample holding trays, the direction of the outer edge (bark side) of the core(s) shall be clearly indicated.

For each sample, fill out an Identification of Wood Boring Sample.

IDENTIFICATION OF WOOD BORING SAMPLE

Senders Sample No. _____ Date Sampled _____

Intended Use _____ Date Received _____

Project No. _____ County _____

Supplier _____ Address _____

Treatment Plant _____ Address _____

Grade Stamp ☐ Yes ☐ No Identification Stamp ☐ Yes ☐ No

Bit Calibration Diameter** _____ Date of Last Calibration _____

Sampled By _____

(Name) (Address)

	Dist. #1	Dist. #2	Dist #3	Dist. #4	Dist. #5	Dist. #6
Report to District(s) [Check Appropriate Box (es)]	☐	☐	☐	☐	☐	☐

Report to Residency (Write Appropriate Residency) _____

Species:
- ☐ Southern Yellow Pine (SYP)
- ☐ Pine (PN) (Other than SYP, **round wood fence posts only**)
- ☐ Douglas Fir (DF)
- ☐ Other

Type of Treatment
- ☐ CCA
- ☐ ACZA
- ☐ Penta
- ☐ Creosote
- ☐ Copper Naph

PLEASE FILL OUT TABLE BELOW COMPLETELY.

Qty.	Size	Charge Number*	Amount of Treatment*	Lumber Grade*	Miscellaneous Information

"X" Sample Type
☐ Monitor (MO)
☐ Proj. Information (PN)
☐ Warehouse Stock (WS)
☐ Research Project (RP)

Any Additional Information:

_____

_____

NOTES:

- Attach copy of inspection report from the treatment plant for treatment charge/lot/batch number sampled.
- Collect a minimum of twenty cores.
- Attach penetration worksheets for pentachlorophenol and creosote samples.

*Charge number, amount of treatment, and lumber grade information can be obtained from the identification brand/stamp/tag, grade stamps and/or from the inspection report.
**Attach copy of bit calibration worksheet.

LAB USE ONLY

LAB NUMBER: AHW - _____

TEST RESULTS:
Penetration: _____ Disposition: ☐ COMPLIES ☐ DOES NOT COMPLY

Retention: _____

NEW BIT CALIBRATION WORSHEET

Calibrate new bits prior to first use.

New Increment Borer Bit

Date:_____

Reading 1:_____ Reading 2:_____

Calibrated Bit Diameter = $\frac{\text{Reading 1} + \text{Reading 2}}{2}$ = [ ]

USED BIT CALIBRATION WORSHEET

Calibrate new bits prior to first use.

By Increment Borer Cores

Date:_____

A. Measurement across Grain	B. Measurement along Grain	Average $\frac{A+B}{2}$
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Sum of Averages: [ ]

Calibrated Bit Diameter = $\frac{\text{Total Sum of Averages}}{20}$ = [ ]

PENETRATION WORKSHEET FOR PENTA & CREOSOTE

Sender's Sample No. _____ Date Sampled: _____

Preservative Type: ☐ Creosote ☐ Pentachlorophenol

Measure and record the penetration of preservative to the nearest 0.1 inch.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Cut the assay zone of each core to 1 inch for Southern Pine or 0.6 inch for Douglas Fir. Do not discard the remaining portion of the core. Keep both pieces of the core together and place them in the sample holder or in individual plastic protective containers. Be sure to indicate the outer edge of the core marked on the sample holder or on each container.