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**Lumber seasoning course held at the Forest Products Laboratory, Feb.
16 to 20, 1953**
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NATIONAL RESEARCH COUNCIL OF CANADA

DIVISION OF BUILDING RESEARCH

No.

146

TECHNICAL NOTE

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FOR INTERNAL USE

PREPARED BY D.C. Tibbetts

CHECKED BY

C.R.C.

APPROVED BY R.F.L.

PREPARED FOR General Reference

DATE February, 1953.

SUBJECT Lumber Seasoning Course Held at the Forest Products Laboratory, Feb. 16 to 20, 1953

It was with pleasure and interest that I accepted the opportunity to attend the lectures given chiefly by Mr. Ralph Millett of the Forest Products Laboratories during the period February 16-20, 1953. Although the course was under the guidance of Mr. Millett throughout he was able to include on the syllabus lectures by the following members of staff of the Ottawa laboratories:

G. E. Bell	- Wood Utilization
J. D. Hale	- Wood Technology
W. E. Wakefield	- Timber Mechanics
J. Ladell	- High-Temperature Drying
E.A. Atwell	- Pathology
E.G. Bergin	- Glueing Operation

The lectures were regularly attended by twenty-two people, with one or two exceptions, representing a cross-section of manufacturers, lumber graders, and suppliers. There appeared to be a keen interest taken by the class judging from the discussions during the break periods and from the questions asked during the lectures. Slides were shown in conjunction with most of the lectures serving to illustrate certain points that were difficult to describe orally or to sketch on the board. There were many exhibits available to illustrate lumber defect, types of woods and their uses, and correct piling procedure. Prepared literature was circulated on subjects pertinent to the lectures and a publication list was made available so that people interested in obtaining other publications of the Department could do so before the Course ended.

A visit to the Singer plant at Thurso, Quebec was arranged by Mr. Millett with the kind co-operation of Mr. Hird, Assistant Manager of the plant. This plant is a modern one in every detail and is a good example of complete utilization of wood. Everything is used but the smoke. To give an illustration of the magnitude of the organization I think it would be satisfactory to mention that the pulse of the plant, namely the power, is electrically generated at the plant in conjunction with steam

boilers. These boilers, in addition to supplying the Prime movers, also supply the necessary steam for veneer logs before cutting, the hot pond, kilns (with a capacity for 50,000 bd. ft. of lumber at one time), heating the plant, and conditioners. When one considers that the fuel for the boilers is "wood waste" and that practically every fragment of sound wood is utilized it gives some idea of the plants' production.

Part of an afternoon was spent visiting the various sections and laboratories of the Forest Products Laboratories which I found to be very interesting and instructive. Following this we were privileged to visit the "Research Sawmill" located in the west end of the city. This mill is not set up on a production basis as is readily recognized when one sees the arrangement; however, it is instrumented to a high degree enabling the staff to record speeds, torques, and vertical and horizontal stresses on the equipment. Strain gauges and counters are used--all instruments being connected to a central control panel for operating and recording purposes.

Although the staff of the Laboratories have done much work in the field of moisture and preservation with regard to wood it is quite evident, and this is a point that they stressed themselves, much remains to be done in this field. I understand that one of their problems is to do with painting over creosoted timber and I believe that their findings will be of interest to the Division. The Building Practice Section has had a few inquiries on this problem in the past and the literature provides only sketchy reference of a doubtful nature as to what is the best method to adopt. Several small points were brought up and to cite an example the question was raised as to what extent lumber should be dried for particular uses. It seems that when one considers the equilibrium moisture content of wood for various uses that it is sometimes as poor a policy to use wood that has been dried to a very low moisture content as it is to use green lumber. Using door and window stock as an example it is now considered good practice to use wood having a moisture content in the vicinity of 12 to 14 per cent for exterior use while for interior use a percentage of 6 would be desirable. Excessive swelling with resultant fracture could easily result if the wood having a moisture content of 6 per cent is used for exterior purposes.

Mr. H. G. Mingo of Eastern Woodworkers attended the lecture for two days only, having to return to New Glasgow on the Wednesday. I remembered that we had one of the huts in use on the N.R.C. grounds that was prefabricated by his company and would have liked to have had more time to talk with him. He mentioned that his company was prefabricating and erecting 150 houses presently going up on serviced land in the St. Johns area in Newfoundland and that the house sections were shipped from Pictou Landing to St. Johns after being fabricated in the New Glasgow plant. He also mentioned that his company was responsible for the erection of the "Riley Nuseum" houses at Gander.

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During the week of the course I was able to talk with Mr. Atwell and Dr. Greaves who had examined some material taken from the floor of the temporary building in the west court of the Sussex St. Building. I hope to include their findings in a report on that floor in the near future.

I would think that the course, from the point of view of the staff at the Forest Products Laboratories, served to fulfil several purposes:

- (1) It served to assist the members in the lumbering business with problems they had been encountering in the past.
- (2) It impressed those attending with the amount of work that the Forest Products Laboratories had done in the past and acquainted them with the available facilities and some of the future work that was to be undertaken.
- (3) The staff learned a great deal in that it found out what was bothering people in the industry and in addition some information on how these people themselves had overcome certain problems was gleaned.

It seemed to me that the lecturers were able to "talk the language" of the lumber industry and judging from the discussions, that invariably take place between lectures, it would appear that no one present thought the course to be a waste of time but rather that the Forest Products Laboratories were really doing something concrete to improve existing methods and to introduce new and better ones. The fact that the Forest Products Laboratories have some realistic equipment, (veneer lathes and kilns for example), the operation of which was demonstrated, added materially to the course.

Courses such as I attended at Forest Products Laboratories can no doubt be carried out by the Division when our staff and facilities permit. A week-long course necessitates a fairly heavy schedule and consequently much preparation and should we be able to carry out such a program in the future, say for a course in Building Inspection, I feel that we should be in a position to also "talk the language" and at the same time have some concrete examples and publications to augment the lectures. Attached are the Course Syllabus and nominal list of those attending.

Members of Lumber Seasoning Course, at the
Forest Products Laboratory of Canada,
Ottawa, February, 1953

<u>Name</u>	<u>Firm</u>	<u>Address</u>
Chas. A. Baker	Pedwell Lumber Co. Ltd.	Orillia, Ontario
Jack Barker	J.J. Barker Co. Ltd.	Cowansville, P.Q.
C. Murray Beach	Beach Furniture Ltd.	Cornwall, Ontario
Wm. J. Bell	Peter Thomson & Sons Ltd.	Alliston, Ontario
F. Wm. Broughton	Canadian National Railways	360 McGill St., Montreal, P.Q.
R. Percy Healey	Canada Wood Specialty	Front St., Orillia, Ont.
Jack C. Herter	Globe Furniture Ltd.	Waterloo, Ontario
L.W. Hird, Jr.	Signer Mfg. Co.	Thurso, P.Q.
Frank Hodgkinson	Pedwell Lumber Co.	Orillia, Ontario
Dorland Houston	Houston Co. Ltd.	75 St. Paul St. Belleville, Ont.
Joseph Jennings	R. Laidlaw Lumber Co.	2280 Dundas St. Toronto, Ont.
F.W. Jones ^{Her} (Absent)	Dept. of National Defence	Ottawa, Ontario
Herbert B. MacDonald	Brunswick-Balke-Collender Co. of Canada Ltd.	38 Hanna Ave. Toronto, Ont.
John G. McLean	T.H. Hancock Ltd.	Carrying Place, Ont.
H.G. Mingo	Eastern Woodworkers	New Glasgow, N.S.
John Muir	Moore Dry Kiln Co. of Canada	Brampton, Ont.
Basil C. Musclow	Great Northern Woods	North Bay, Ont.
Ernest Gordon Nyles	Can. General Electric	Peterboro, Ont.
Claude Painchaud	Canada Flooring Co. Ltd.	1304 Beaumont Ave. Montreal, P.Q.

Members of Lumber Seasoning Course, at the
Forest Products Laboratory of Canada,
Ottawa, February, 1953 (Continued)

<u>Name</u>	<u>Firm</u>	<u>Address</u>
Wm. Quenville	W.C. Edwards Co. Ltd.	991 Somerset St., Ottawa, Ont.
Alex. Rose	International Plywoods Ltd.	Gatineau, P.Q.
A.C. Thompson - (Absent)	Thompson Wood Products Ltd.	420 Lagauchetiere St. West, Montreal, P.Q.
Donald C. Tibbetts	Division of Building Research	N.R.C., Montreal Rd. Ottawa, Ont.
J.D. Wadleigh	Canadian Hardwoods Ltd.	Casselman, Ont.

Time Table for Lumber Seasoning Course

February 16 - 20, 1953

Date	Hour	Subject	Lecturer
Monday, Feb. 16	9:00 - 9:15	Registration	
	9:15 - 9:30	Opening remarks	H. Schwartz
	9:30 - 10:00	Importance of woodworking indus- tries.	G.E. Bell
	10:00 - 12:00	Structure of wood.	J.D. Hale
	2:00 - 2:30	Purpose of seasoning lumber.	R.S. Millett
	2:30 - 3:30	Determination of moisture content and calculations of oven- dry weight.	R.S. Millett
	3:30 - 5:00	Preparation and demon- stration of sample boards.	R.S. Millett
Tuesday, Feb. 17	9:00 - 10:00	Weighing of sample boards and calcula- tion of their moisture contents and oven-dry weights.	R.S. Millett
	10:00 - 11:00	Piling for kiln-drying.	R.S. Millett
	11:00 - 12:00	Kiln controls and maintenance of kiln equipment.	R.S. Millett
	2:00 - 3:30	Moisture in wood, and how wood dries, with particular reference to the development of drying stresses.	R.S. Millett
	3:30 - 4:30	Strength of lumber as related to its moisture content.	W.E. Wakefield
	4:30 - 5:00	Review.	R.S. Millett
Wednesday, Feb. 18	9:00 - 9:30	Weighing of sample boards, calculation of moisture contents and setting of controls.	R.S. Millett
	9:30 - 10:30	Drying schedules and kiln operation.	R.S. Millett
	10:30 - 11:15	Special seasoning methods.	R.S. Millett
	11:15 - 12:00	High-temperature drying.	J. Ladell
	1:30 - 5:00	Visit to Singer Manufac- turing Plant at Thurso	

Date	Hour	Subject	Lecturer
Thursday, Feb. 19	9:00 - 9:30	Weighing of sample boards, calculation of moisture contents and setting of controls.	R.S. Millett
	9:30 - 10:30	Circulation and temperature.	R.S. Millett
	10:30 - 11:00	Moisture content in reaction to stain and decay.	E.A. Atwell
	11:00 - 12:00	Types of kilns.	R.S. Millett
	2:00 - 3:30	Defects and degrade, their cause and prevention.	R.S. Millett
	3:30 - 4:00	Importance of moisture content for gluing operations.	E.G. Bergin
	4:00 - 5:00	Air-seasoning.	R.S. Millett
Friday, Feb. 20	9:00 - 9:30	Weighing of sample boards, calculation of moisture contents and setting of controls.	R.S. Millett
	9:30 - 10:30	Storage and shipment.	R.S. Millett
	10:30 - 12:00	Review.	R.S. Millett
	2:00 - 5:00	Visit to manufacturing firm substituted for tour of Forest Products Laboratories and Research Sawmill.	R.S. Millett