

# Timber Concession

## Manual of Procedure\*

### CHAPTER 21

#### TIMBER CONCESSION

**SEC. 186. LICENSE AGREEMENT.**—A timber agreement or “concession,” as commonly referred to, is a long term license granted by the Director of Forestry with the approval of the Department Head which provides for the exclusive privilege of cutting, collecting, and removing timber from a designated area of the public forests for a period not to exceed twenty years.

**SEC. 187. REPORT ON APPLICATION FOR TIMBER LICENSE AGREEMENT.**—Upon receipt of an application for a timber license agreement, the Director may, if necessary, cause the investigation of the area applied for and a comprehensive report shall be submitted which includes, among others, the following points:

- (a) Name and character of applicant
  - (1) Nationality.
  - (2) Brief history.
- (b) Capital and resources.
  - (1) Sawmill machinery, logging equipment, etc.
  - (2) Contemplated investment and plan of work for the development of the concession if granted.
  - (3) Other kind of machinery, if any.
- (c) Area.
  - 1. Permanent timberland.
    - a. Exploitable forest.
    - b. Unexploitable forest.
  - 2. Temporary timberland.
    - a. Exploitable forest.
    - b. Unexploitable forest.

- (d) Topography.
- (e) Stand.
  - 1. Per hectare.
  - 2. For the whole area (by blocks).
  - 3. Per cent by species (by blocks).
- (f) Estimated number of years to exploit.
- (g) Necessity of exploiting the forest.
  - 1. Demand for agricultural lands.
  - 2. Amount of mature and over-mature timber in stand.
- (h) Estimated income of the Government from forest charges.
- (i) Logging possibilities.
  - 1. Logging methods or method of exploitation adaptable for each block or chance.
- (j) Silvicultural methods to be adopted.
  - 1. Cutting rules.
  - 2. Plan of reforesting vacant or logged over areas.
- (k) Reasons for granting the area under a long term license agreement.

**SEC. 188. ADMINISTRATION OF CONCESSIONS.**—In the administration of a timber concession, the officer in charge thereof shall carefully read each and every provision of the license agreement and see to it that the same is properly carried out and observed. He shall also be guided by the following general instructions which shall be supplemented from time to time as circumstances warrant.

- (a) *All timber must be scaled.*—All tim-

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\* Reprinted from the *Manual of Procedure*, Bureau of Forestry.

ber cut by the licensee shall be scaled strictly in accordance with the scaling instructions laid down in this Manual for the collection of the forest charges due the Government.

(b) *Place for scaling.*—Whenever practicable, scaling should be done in the woods following felling and bucking crews to prevent loss of logs by deterioration, fire, transportation, abandonment, etc. If the scaling place is not satisfactory, the Director, thru channels, should be immediately advised, giving reasons and recommendations therefor. It is ordinarily provided in license agreements that scaling in the concessions where regular scalers are stationed shall be conducted in such places as shall be designated by the Bureau of Forestry. The aim of this Bureau is to have all scaling work done in the woods provided actual conditions so warrant. However, when methods of logging, shortage of personnel, or any other condition do not justify scaling in the woods, the work may be performed at the most advantageous place from the standpoint of efficiency and facility in the careful examination of defects of individual logs.

(c) *Submission of reports.*—All scaling and concession reports must be submitted as provided in Part I, Chapter II and section 212 of this Manual.

(d) *Plan of work in advance.*—The officer in charge shall see to it that the scalers are informed in advance of the proposed location of the new set-ups and also of the place where a yarding line in a set-up is to be transferred. This will avoid scaling in the "loop" and will prevent the scaler concerned to be "caught up" in the logs that should be scaled before yarding.

(e) *Keeping records of payment.*—Payments made by the licenses of monthly scale reports and invoices shall be recorded. Any monthly scale or invoice not reported as paid after sixty (60) days from the end of the month covered by that particular scale should be reported immediately to the Director, thru channels.

(f) *Security and accuracy of records.*—The scaler must guard his records well against loss or theft. It is his duty to see that both the licensee and the Government receive full justice always. Unless he is careful, he is apt to do either one an injustice; so it is essential that he exercises great care in his decision. In case it is impossible to decide one way or the other with certainty, give the licensee the benefit of the doubt and request instructions from the Central Office for future guidance. This refers both to field and office work. Great care should be exercised both in field and office work in obtaining the figures, in setting them down in computing, and in drawing up the totals.

(g) *Boundaries for concession.*—The officer in charge, scalers, concession guards and all other forest officers who are engaged in the administration of the concession shall be fully acquainted with the corners and the boundaries of the area under the license agreement or concession. Concession guards should be shown the exact location of the boundaries and corners of the concession, the extent of the communal forests, reservations or private claims within or adjoining concessions.

(h) *Operations within concession.*—The officer in charge shall see to it that the operations of the concessionaire shall not go beyond the boundaries of the concession. When the operations approach any boundary of the concession, such boundary should be clearly established on the ground, if found advisable. The licensee should be requested to furnish the necessary laborers for the establishment of the boundary. The officer in charge shall be particularly careful that the boundaries of any adjoining communal forests are not encroached upon by the licensee.

(i) *Knowledge of logging plans.*—The officer in charge should be fully acquainted with the logging plans and methods of the operator. He should render a report from time to time thru channels to the Director

of such plans and methods and submit his comment and recommendations as to their suitability in the proper management of the forest.

(j) *List of authorized agents, loggers, etc.*—A list of the names of all the authorized agents, loggers or contractors of the licensee or operator should be secured.

(k) *Enforcement of diameter limit.*—The diameter limit set by the Director shall be enforced and all undersized trees that are cut contrary to existing regulations should be invoiced with 300 per cent surcharge and with no deduction for natural defects. Any violation of the diameter limit rule should be reported thru channels to the Director with a statement as to whether it has been done deliberately or whether the undersized trees cut were those that were unavoidably uprooted or seriously injured in the process of felling and yarding or those cut within the rights-of-way. On areas classified as alienable and disposable, the trees may be cut irrespective of size. In timberlands, however, the diameter limit should be enforced, except on the rights-of-way, including the cableways used in yarding or skidding logs. For the purpose of scaling, a railroad right-of-way is a strip 20 meters wide—measured 10 meters on each side from the middle of the track. Right-of-way for cableways, however, should cover only the actual track followed by the logs when being yarded or skidded.

(l) *Prevention of unnecessary damage.*—Unnecessary damage to young growth, trees marked for seed purposes and prohibited species, shall be prevented. Violations committed by the operator in this case should be reported thru channels to the Director giving practical recommendations to remedy them.

(m) *Patches of uncut timber.*—Patches of commercial timber that may be left uncut by the operator before operations are transferred to other cutting areas should be reported thru channels to the Director with

full comments and recommendations on the matter.

(n) *Survey and classification of timberland.*—A survey and classification should be made as soon as possible of such areas within the timberland or unclassified public forest that may be designated for clear cutting because of their being potentially agricultural in character. The area may be divided into blocks and each block shall be reported on B.F. Form No. 1-T. In preparing this report, the instructions on "Land Classification" should be followed. District foresters should see to it that the areas under their jurisdiction which are under license agreements or under licenses with sawmills are classified as soon as practicable.

(o) *Logging and milling reports.*—As soon as the milling and logging operations have begun, complete sawmill and logging report should be submitted in accordance with the outline on the "Report on Logging and Milling Operations," Appendix VII.

(p) *Forest fire.*—Forest fires should be kept out of the concession. Any fire which may occur within the concession should be immediately reported thru channels to the Director giving complete details thereof and a recommendation as to the action to be taken on the matter. (Refer to Part IV, Chapter 36 for outline of fire report.)

(q) *Cooperation with operators.*—With the view of forestalling any violation of any of the provisions of the license agreement, thru ignorance or otherwise, on the part of the operator's men, the attention of the operator should be called to such provisions whenever circumstances demand. The officer in charge of the concession should endeavor to cooperate with and be of service to the operator in so far as the rules and regulations of the Bureau will permit.

(r) *Inspection of abandoned logs.*—In the inspection of abandoned logs, forest officers should always secure an authorized representative of the operator in order to avoid possible complaint based on such pretext as lack of knowledge of the where-

abouts of the abandoned timber. This representative should have a written authorization from the manager or superintendent, copy of which should also be furnished the inspecting officer. After the inspection the agent should be required to sign a certified statement preferably in local dialect of the number of logs scaled and marked with B.F. marking hatchet in his presence.

(s) *Application of public lands within concession.*—In taking final action on public land applications in unclassified logged-over areas inside a concession, forest officers should confer with the operator whenever necessary, with the view to ascertaining whether such areas have already been definitely abandoned or not, or whether such areas are or will be needed by them for camp site, timber depot, etc., and act accordingly.

(t) *Reporting of violators.*—In addition to violations of the provisions of the agreement, any violation by the operator of the provisions of the Forest Laws, Forest Regulations, Internal Revenue Regulations, and all other rules and instructions should be reported to the Director thru channels.

(u) *Instruction of forest guard.*—Concession guards should be given proper instruction by the officer in charge concerning the investigation or seizure of illegally-cut timber as well as the preparation of the necessary invoices in connection therewith. Officer in charge of scaling stations should refrain from employing concession guards in the work that has no relation to or bearing in the patrol of the concession.

(v) *Checking the work of concession guards.*—Officers in charge, either personally or through subordinate rangers, should go over the patrol beat of concession guards and check their work. Illegal timber cutting and *kaingin* making in the concession are two big activities which concession guards should look after. It is much better to prevent the occurrence of these activities than to detect them and mete punishment to the wrongdoers after the destruction has been done.

**SEC. 189. SCALING PROCEDURE.**—The basis of the present systems of scaling used by the Bureau is the provision of section 263 of the National Internal Revenue Code, as amended by section 1, of Republic Act No. 151, which read as follows:

“SEC. 263. Mode of measuring timber.—Except as hereinbelow provided, all timber shall be measured and manifested in the round or squared, before being sawn or manufactured. The volume of all round timber shall be ascertained by multiplying the area of the small end by the length of the log, the diameter of the log to be measured exclusive of the bark; but if the end of a log is irregular the average diameter shall be used; and in order to ascertain the volume of a log more than eight meters long, the diameter of the middle of said log, or the average of the diameters at both ends thereof, shall be used as basis. If a log in the round, cut under license, is measured and manifested by forest officers, the Director of Forestry shall make due allowance for rot, cavities, or other natural defects; but from any decision of the Director of Forestry in this respect, an appeal shall lie to his Department Head, whose decision shall be final. The manifest of timber cut by licensees operating sawmills in or near the forest shall be attested by forest officers whenever practicable.

“The volume of squared timber shall be ascertained by multiplying the average of the cross section measured by the length, to which forty per centum shall be added for loss in squaring: *Provided, however,* That if squared timber cut under license is measured and manifested by forest officers, the Director of Forestry shall make due allowance for rot, cavities or other natural defects; but from any decision of the Director of Forestry in this respect, an appeal shall lie to his Department

Head, whose decision shall be final. The privilege of manifesting timber after squaring shall, however, be granted only to licensees who have squared their logs in the forests with the ax and intend to take it to the market in this form.

"If sawn or otherwise manufactured timber is found which has not been manifested in accordance with the provisions hereof, the corresponding forest charges shall be assessed on twice the volume of the actual contents of such sawn or manufactured timber."

**SEC. 190. DETERMINING FACTORS OF THE NET SCALE IN THE LOG.**—In determining the net scale of a log the principle involved is that all natural defects, including cavities, are to be excluded. The use to which a log is to be put or the estimated amount of any particular grade of lumber it can yield should not in any way influence the net scale of that log. Whether, therefore, a log is to be sawn or not, or to be employed in its natural state, allowance should be made for natural defects if they exist. In other words, deductions will be made for natural defects even if they are found in pilings, construction timber, ties and the like.

**SEC. 191. MERCHANTABLE LOG.**—A sound basis for culling a log or excluding it from the scale is its merchantability. A merchantable log has been defined as one that contains sufficient lumber to make it profitable to take it to a mill and have it sawed. In other words, even if a log is quite defective or is small, it is merchantable provided it brings enough value to pay the costs of logging or those of both logging and milling if it is sawn into lumber. There is undoubtedly a wide variation in the limits of merchantability, at least for different species, but subject to revision when adequate data on costs are available, the following shall be considered as merchantable timber and shall be scaled:

(1) Any log utilized or removed from the forest, regardless of diameter or length.

(2) Abandoned logs which are not less than 3 meters long and 30 centimeters in diameter at the small end. Provided that if a log comes up within this minimum diameter of 30 centimeters but is shorter than 3 meters because of improper bucking, the same should be scaled regardless of length.

(3) Abandoned top, regardless of length, having a diameter at the small end of at least 30 centimeters.

It may be noted that no mention is made as to how long an abandoned top should be in order to consider such top as merchantable timber. The reason for making no such mention is that proper utilization of timber will not permit the leaving of sound tops and if it is done it is due mainly to careless bucking. If, however, the leaving of a top is done with the object of avoiding a pronounced crook on the log next to it, and if the top left is less than 6 feet or 1.83 meters long, then such top should not be scaled. Tops that could have been properly included in the top log should be scaled.

(4) All abandoned timber having a diameter of less than 30 centimeters at the small end, provided such timber is intended for use that requires a diameter of less than 30 centimeters at the small end, such as railroad ties, telephone poles, etc.

(5) All stumps cut above the proper height. In the case of trees without buttresses, the height of stumps should not exceed the (stump) diameter. In the case of trees with buttresses the forest officer should use his own judgment as to what should be the proper height, but under no circumstances will it be higher than the top of the main buttress.

(6) The timber, under paragraphs 1 to 5, above, must at least contain 33-1/3 per cent of its gross volume sound if it is first group and at least 50 per cent sound if it belongs to any of the lower groups; otherwise, they shall not be scaled.

**SEC. 192. VOLUME CONSIDERED IN SCALING.**—The volume considered in Scaling will be the cylinder represented by the small diameter, inside bark, for logs, eight meters or less in length or by the middle diameter, inside bark in the case of logs more than eight meters long. No deduction will be made for defects occurring outside of the cylinders; nor will any allowance be made for trimming.

**SEC. 193. SCALING SUPERVISION.**—(a) *Frequent check of scalers.*—Officers in charge of stations and check-scalers should check up the work of their scalers as frequently as practicable. In this check, careful attention should be given to the individual scaler's accuracy in measuring the necessary dimensions of the logs as well as to his judgment for defects. This work should be done in the presence of the scaler whose work is being checked so that any irregularity discovered may be straightened out right on the ground.

(b) *Judging a scaler.*—Not infrequently officers in charge and check-scalers either on their own initiative or by instruction from superior officers, make reports on the fitness or standing of scalers. The officer making such report should bear in mind the fact that the efficiency and desirability of a scaler is in large measure dependent upon his (1) good judgment for defects; (2) accuracy in measuring logs; (3) tactfulness in dealing with the lumber companies' men; (4) systematic and intelligent planning of his own work; (5) alertness to notice conditions occurring in logging operation or in the mill which might directly or indirectly affect his work and (6) interest in the work.

(c) *Program of scalers.*—When the place of scaling is in the woods, the officer in charge should arrange the program of work for his scalers in such a way as to reduce to the minimum the time of travel from the forest station to the cutting areas and return.

**SEC. 194. SCALING DISCUSSION WITH OUTSIDERS.**—Scalers are not allowed to dis-

cuss scaling with any of the men of the lumber operators or anyone not connected with the Bureau of Forestry. All questions concerning scaling that may be asked of them should be referred to their officer in charge. Scalers, including officers in charge should avoid discussing on the ground with private persons, questions of deduction and identification of individual logs that are being or have been scaled, or anything in scaling that would only result into an endless arguments. Methods of scaling by this Bureau may be explained but without any actual reference to any individual log. Scale books or records shall not be shown to any person outside the Bureau, nor shall the deduction on an individual log be given, except when expressly authorized by the Director in each case.

**SEC. 195. CLASSIFICATION OF LOG DEFECTS.**—(a) *Interior defects.*—(1) center rot (C.R.)—This will include all defects except butt rot in the center of the log whether in the form of rot or hole, regular or irregular.

(2) Heart Shake (H.S.)—Is a crack appearing at the end of a log in the form of a complete or partial circle. Fig. 1—Plate I.

(3) Heart checks (H. Ch.)—Are more or less radial cracks emanating from the central core of the log. Fig. 2—Plate I.

(4) Brash center (B.C.)—Is a defect occurring also in the center of the log. This has a circular form and is distinguishable at the ends of a log of some species because it has a distinctly coarser surface than the merchantable portion.

(5) Butt rot (B.R.)—As its name implies is a defect found in butt logs and for the purpose of this Manual will be described as such only if the rot does not extend through the entire length of the log or in case the defect is center rot but allowed for as butt rot; otherwise it will be known merely as center rot. Fig. 6—Plate I.

(b) *Side defects.*—(1) Cat face (C.F.) This is characterized by an exposed surface of the woody portion of the log due to the

PLATE I SHOWING LOG DEFECTS AND METHODS  
OF MEASURING LOG LENGTHS



Fig. 1



Fig. 9



Fig. 2

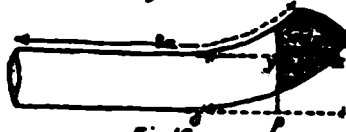


Fig. 10



Fig. 3

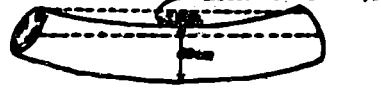


Fig. 11

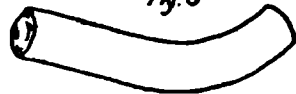


Fig. 4

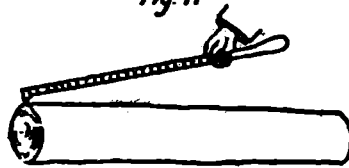


Fig. 12



Fig. 5

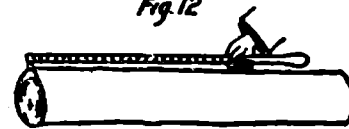


Fig. 13



Fig. 6

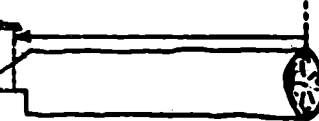


Fig. 14

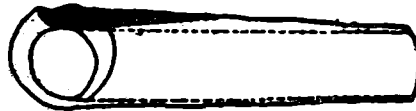


Fig. 7

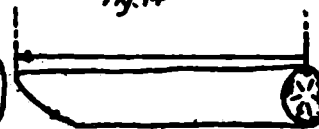


Fig. 15



Fig. 8

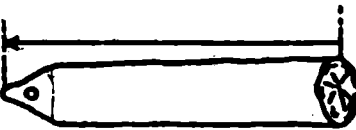


Fig. 16

PLATE II SHOWING LOG DEFECTS AND METHODS OF MEASURING  
SQUARED LOGS AND MANUFACTURED TIMBER



Fig. 1:  
Deduction = H.ch.  $\frac{1}{4}$  or  $\frac{1}{3}$  or 11%

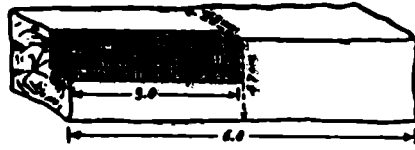


Fig. 2 Sq. log .43 x .47 x 6 = 1.21 Cu.M.  
R.R. .15 x .25 x 3 = .11 Cu.M.;  $\frac{1}{4}$  or 9%



Fig. 3  
Sweep log; Gull portions (x)  
Sm.  $\frac{1}{4}$  or 17%



Fig. 4  
Split log; Measure dimensions  
at dotted lines.

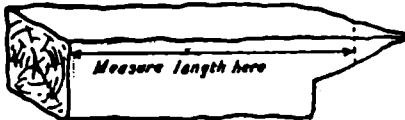


Fig. 5. Butt log, long undercut; measure  
midway between saw-cut line and extreme point.

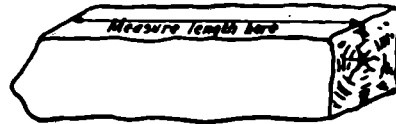


Fig. 6  
Butt log, short undercut.  
Measure length as indicated.

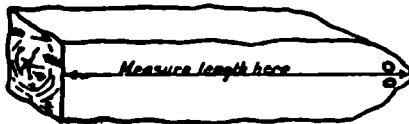


Fig. 7  
Noosed and Sniped log.



Fig. 8  
Irregular log. Take average thickness  
at both ends as indicated



Fig. 9  
Octagonal log. Measured as round.

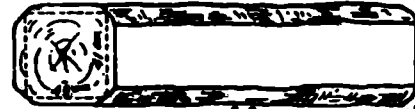


Fig. 10  
Octagonal log. Measured as square  
at dotted lines.

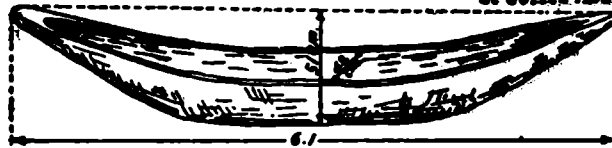


Fig. 11  
Diam. 51 cm. length 6.1 m. Vol. =  $(51)^2 \times (.7854) \times 6.1 = 1.25$  Cu.M.  
Plus 100% for manufacturing; total volume = 2.50 Cu.M.



destruction of the bark and wood by fire or some mechanical agent. Figs 7, 8, and 9—Plate I.

(2) Sun or season checks (S.Ch)—Are cracks due to effects of drying. These extend from the surface towards the center of the log.

(3) Rotten knot (R.K.)—Is a decayed knot. A rot entering through a knot may extend towards the center of the log and works its way upward and downward then causing center rot to appear on both ends of a log.

(4) Wormy (W.)—This refers only to attacks on the log made by grubhole borers and other large borers. It does not include pinholes.

(5) Unsound Sap (Un. S.)—Applies to rot or decay on the sapwood.

(6) Split (Sp.)—It may be split on the side of a log or may run through the heartwood.

(c) *Crooks*.—Crook (Cr.), Sweep (Sw.), or Double Crook (Db. Cr.)—As used in this case, a crook is an abrupt bend confined only to a certain portion of the log, while sweep is a gradual curve extending over the entire length of the log. Double crook is simply a double curve in the log. Figs. 3, 4, and 5—Plate I.

SEC. 196. METHOD OF DEDUCTION FOR DEFECTS.—(a) *Needs of proper manufacturing to eliminate defects*.—It may be stated from the outset that there is a wasteful as well as an efficient way of cutting out defects of various kinds. The intelligent and experienced sawyer cuts out the defects of the log that he saws in such a way as to get the maximum yield of merchantable lumber. Any sound and equitable basis for making deductions in scaling work, however, can not entirely disregard the limitations of the lumber manufacturing machineries with which the modern mills in the Islands are at present equipped. In determining the amount to be deducted for a particular defect, a scaler should not

blindly make conclusion from the tally that he actually got but should also take into consideration as to whether or not the defect was cut properly. It must be remembered that the scaler's deduction for defects does not include wastes in manufacture. The various methods of deduction for defects are discussed below:

(b) *Interior defects*—Center Rot; Heart Shake; Brash Center.—This class of defects shall be deducted by inclosing the defect in an average square of a size sufficient to exclude all of it out from the sound or merchantable portion of the log. These defects do not run through to the other end of the log in a uniform way and the manner by which the rot affects the adjoining sound wood varies. Therefore, the side of the square to circumscribe the circular defect should not merely correspond to the actual diameter of the circular defect but an allowance should be given to cover the above irregularities. What this allowance should be, varies with different species and even for the same species in different regions. The scaler's best guide in this matter is his knowledge of the characteristics of these defects in his region. To determine the dimensions of the proper square that will inclose the center defect requires experience and skill. But after these have been acquired, the work becomes a mere mechanical operation; the per cent to be deducted which is found by dividing the volume of the defective portion by the gross volume of the log could then be simply looked up in the table of deduction for center or circular defects for both round and square logs, copies of which are supplied each scaling station. But the per cent of deduction corresponding to the common ratios given below, should be in the minds of every scaler as they serve as a general check in individual deductions of logs and also are valuable in giving offhand information to lumbermen and others deserving to know the method of scaling of this Bureau.

## DEDUCTIONS FOR CENTER OR CIRCULAR ROT

of diameter of log Circular rot in terms	Per cent to be deducted	
	For round logs	For squared logs
2/3 .....	57	44
5/8 .....	50	39
3/5 .....	46	36
1/2 .....	32	25
2/5 .....	20	16
3/8 .....	18	14
1/3 .....	14	11
3/10 .....	11	9
1/4 .....	8	6
1/5 .....	5	4
1/6 .....	4	3
1/7 .....	3	2
1/8 .....	2	2
1/9 .....	2	1
1/10 .....	1	1

(1) *Hints, in making allowances for center rot, heart shake, and brash center.*—Some practical observations may be mentioned with regard to making allowances for these kinds of center defects as follows:

a. It has been observed that in some species the boards cut from the portion immediately adjoining the center rot are absolutely sound, and, in such case, it is often possible to reduce the size of the square inclosing the center rot as it is seen at the end of the log so as to be nearly the same as the diameter of the defect.

b. If the rotten wood in the log is not separated from the sound wood by a distinct line, care must be taken in determining the square that will inclose it so that the full defective portion is taken out from the scale of the log.

c. If the rot is irregular, the allowance to be given is generally relatively much bigger than its actual size as it appears at the end of the log.

d. Brash center may only slightly affect the surrounding wood. Lumber cut from such portion of the log would ordinarily come up to the grade of merchantable.

Therefore, in inclosing this defect in a square, the slightly affected part around the edges may be excluded.

e. In judging center rots that do not go through the whole length of the log, the scaler, will of course have to estimate the portion of the length affected. The end of a rot inside a log is often indicated by a swelling and scalers should look for this, or similar signs, in scaling defective logs so that they may have as definite a basis as possible for their estimate. In this connection, the fact must not be overlooked that the central core of most of the Philippine timber from end to end is brashy, contains heart checks, or is otherwise unmerchantable. In other words, although only one end of the log is defective because of the presence of center rot, it does not necessarily mean that the other end of the central core is sound. With few exceptions, it is invariably affected by other defects as stated above.

(2) *Heart checks.*—This defect extends through the entire length of the log although it usually appears at the end of a log only as short radial cracks around the pith. This defect appears on a board as longitudinal short cracks or seams, sometimes filled with resin, and the whole face of the board is affected. This characteristic may be clearly seen in Apitong. Under such condition, the defect may properly be inclosed in a square similar to the case of other center defect. The square, however, should include only such portion of the log as is seriously affected by the cracks. A check or crack as seen at the end of a log usually extends almost from the center to the surface of the log. Only a portion of it, however, will have any effect on the merchantability of the boards cut through it. Heart checks should not be confused with sun checks appearing at the end of the logs when such are exposed to rapid drying.

(3) *Butt rot.*—This kind of defect usually tapers off abruptly. It should be deducted by inclosing the rot in a square,

which should include its actual size as it appears at the butt end of the log and the necessary allowance for irregularities, as shown in Fig. 6, Plate I. The method of determining the per cent to be deducted is the same as that for center rot, except that only four-fifths of the full estimated length of the butt rot should be culled. Other defects in the log, if any, should of course be allowed for in addition to the above. Example: a 9-meter log with a diameter of 80 centimeters, containing a butt rot and 20-centimeter brash center at the other end. Suppose the butt rot in this log could be properly inclosed in a square, the side of which is 40 centimeters and its estimated full length is 3 meters. From the table of deduction for center or circular defects, the per cent to be deducted when the rot is one-half of the diameter (40/80) is 32 per cent. Inasmuch as only four-fifths of 3 meters or 2.4 meters is to be culled, the deduction for the butt rot alone is  $2.4/9$  of 32 per cent or 8.5 per cent. The length of the brash center that is not affected by the butt rot is 9 minus 3 or 6 meters. Looking up again at the table of deduction for center defects, it will be seen that if the defect is one-fourth of the diameter of the log (20/80) the deduction is 8 per cent. But since the length of the brash center is only 6 meters or two-thirds of the long, the per cent to be deducted for this defect is two-thirds of 8 per cent or 5.3 per cent. The total per cent, therefore, to be deducted from this log is  $8.5 + 5.3 = 13.8$  per cent or 14 per cent. Center rot which does not extend through the entire length of the log and which has much bigger diameter than the center defect appearing on the opposite end of the log will be allowed for in the same manner as butt rot.

(c) *Side defect.*—(1) *Cat face.*—With the percentage method of deducting defects, ability to visualize quickly the log into sections and throw its defective portion into one of these sections is particularly important in actual estimation for cat face

and similar side defects. It is assumed that the scaler has thorough knowledge of how defects in his own particular region “open up.” If the rot due to cat face is outside the cylindrical volume based on the scaling diameter of the log, no deduction will be made. If, however, the inner circle is affected, the defect may be deducted either as part of a ring or as a sector, depending upon whether the rot is shallow or extends deeply into the heart (Figs. 7, 8, 9, Plate I). It is obvious that the scaler’s first step to take in judging the above defect is to determine its extent, width, depth, and length. Then the volume of the section, expressed as a per cent of the total volume of the log, into which the defect is thrown, is computed. Thus in Fig. 8 in order to find (a), the volume of the ring must be known. Example: Suppose the diameter of the big circle in Fig. 8 is 50 centimeters and that of the small circle is 40 centimeters. Then the volume represented by the small circle is  $(4/5)^2$  or 64 per cent of that of the big circle. Therefore, the volume of the ring is 100 per cent minus 64 per cent or 36 per cent. And (a), being about one-fourth of the ring, is therefore 9 per cent of the total volume of the log. In Fig. 9, the per cent of deduction for the sector inclosing the defect is found by dividing the circle into as many equal sections as it could contain. Thus in the figure it is about one-fifth of the circle or 20 per cent. The length of the defect will of course affect proportionally the total amount to be deducted.

(2) *Sun or season checks.*—If the cracks are so deep and numerous as to make the portion affected unmerchantable, the defect will be described and deducted in the same manner as explained under Fig. 8, with the exception that the whole volume of the affected ring of the circle will be culled, instead of a part of the same as in cat face. No deduction will be made for this defect if the log has been left unnecessarily long

either in the woods or on the log landing at the mill.

(3) *Rotten knot*.—The effect of rotten knot is so variable that it is hard to make a fixed rule for making allowance for it. It is often the case that a dot or rot in a big knot is an indication of an enlarged defective area inside the log. The extent of this defect is sometimes shown by a flare or swelling on the affected portion of the log. Rotten knot and center rot make a combination of defects in a log that frequently calls for a big per cent of deduction, if not totally cull the whole log. Practical ability of a scaler in deducting for this defect depends upon his accurate estimate of its extent and his skill in determining what section of the cylindrical volume of the log would properly enclose it. The minimum merchantable length of lumber used in scaling must not be overlooked in this connection. If, as is sometimes the case, the log is defective at one end, due to rotten knots, leaving a sound portion at the other end, which is less than six feet long (1.83 m.), this sound end will be considered as if also culled due to the rotten knot and the per cent to be deducted in the log will be decided accordingly, provided the mill concerned does not utilize short pieces.

(4) *Wormy*.—Usually only the outside shell of the log attacked by grub worms is seriously affected. Under such a condition, this defect will be deducted for in exactly the same way as in sun or season checks. If a few holes penetrate deeply into the heartwood, the effect on the merchantability of the interior wood should be judged and deductions will be made accordingly. No deduction will be made if the attack on the log by borers was due to the fact that the party concerned allowed it to stay too long in the water, log landing at the mill, or in the woods.

(5) *Unsound sap*.—The method of making allowance for this defect will be the same as for wormy or sun or season checks.

(6) *Split*.—If the split is clearly due to

careless handling of the log, no deduction will be made for it. It is essential that the scaler have a good knowledge of efficient handling of the log under different conditions from the stump to the mill so that he may be able to use intelligent and fair judgment in this matter. It must be remembered that this defect is in some cases unavoidable, even if special care is exerted in handling the log. In deducting for this defect, the dimensions of the rectangle that would fully inclose it should be determined and then the volume of the same is reduced into a per cent of the gross volume of the log.

(d) *Crooks*.—(1) *Crook*.—If the curve in a log is confined only to one end, it is relatively simple to make allowance for it. The scaler should sight along the straight sides of the log, noting where they pass thru the crook if prolonged. Then throw all the waste due to this defect into one section and determine the per cent of deduction by dividing the length of the wasted section by the total length of the log and multiplying by 100. Thus in Fig. 10, Plate I, section (A) will be the equivalent net waste due to the crook. It is about one-eighth of the total length of the log and the per cent of deduction would therefore be one-eighth of 100 per cent or about 12 per cent. The portion,  $x y z$ , from which merchantable wood may be obtained, will practically offset the air space, represented by  $z o p$ . No deduction should be made if the crook could have been avoided by proper bucking. The scaler in the woods has good opportunity to make fair judgment with regard to this particular point.

(2) *Sweep*.—If the log has a sweep, the per cent of loss due to it can not be so easily determined as that of a crook which is confined only to one end, without some experience. The following table of deductions applicable to sweep may serve as a guide to scalers. It is the result of actual studies made in one particular mill and

may be subject to change in other mills where crooked logs are sawn differently.

### DEDUCTION FOR SWEEP IN ROUND LOGS

Amount of sweep in terms of log diameter	Per cent of loss based on gross volume of log
1/12 .....	5
1/10 .....	7
1/8 .....	8
1/6 .....	12
1/5 .....	14
1/4 .....	17
1/3 .....	23
1/2 .....	34

In the above table the amount of sweep is expressed in terms of the small diameter of the log because the loss due to it is not dependent on the number of centimeters of the curve alone but also by the size of the log. The way to determine the degree of sweep is given in Fig. 11, Plate I. Line No. 1 must be drawn parallel to line No. 2, which runs from pith to pith. It will be necessary for the inexperienced scaler to actually stretch a string from one end of the log to the other in determining the amount of sweep. To the experienced scaler, however, this may be determined by mere ocular estimate. Thus, in the above illustration, if the sweep is 5 centimeters and the diameter of the log is 60 centimeters the sweep in terms of log diameter shall be five-sixtieths or one-twelfth and the per cent of deduction would therefore be 5 per cent.

(3) *Double crook*.—The defect must be allowed for much more heavily than a single curve or crook. Roughly, the amount to deduct is found to be 50 per cent more than that for sweep of any given amount. It may be stated that the loss due to crook, sweep and double crook is influenced directly by the minimum merchantable length of lumber considered in scaling.

SEC. 197. RECORDING AND DESCRIBING DEFECTS IN SCALE BOOK.—Under the col-

umn "Kinds of defects" in the scale sheet, the name of the defect in abbreviated form shall be described as follows:

(a) Center rot, heart shake, heart checks, and brash center shall be described by giving the abbreviated name of the defect followed by its size in centimeters. Example: C.R. — 20; H.S. —25; H.Ch.—18; B.C. — 10. The size of the defect should include its actual diameter plus allowance for irregularities. If, however, a center rot not allowed for as butt rot or heart shake does not show at both ends of the log, the estimated length of the defect besides the size of the square that would properly inclose it should be recorded. Thus a center rot or heart shake that could be inclosed in a square, the side of which is 20 centimeters and the length is estimated to be three meters, shall be written as C.R. — 20/3 or H.S.—20/3.

(b) *Butt rot*.—The full estimated length of the rot shall be given. Example: B.R.— 40/3, in which 40 is the diameter in centimeters including allowance for irregularities and 3 the length in meters of the defect. Butt rot should only be described as such when it occurs in a butt log or when the center rot is allowed for as butt rot (sec. 196-b-3), otherwise it shall be classified as center rot.

(c) *Cat face*.—When the cat face is to be deducted as a part of a ring, this defect shall be described as C.F.—2, which means that it is two meters long. When the cat face is considered as a sector, its ratio to the area of the circle where the diameter is taken should be recorded in addition to the length of the cat face. Thus, C.F. — (1/4)/2 means that the defect covers one-fourth of the area of the circle and is estimated to be two meters long.

(d) *Sun or season checks*.—When this defect is to be deducted the thickness of the ring to be culled shall be given. Example: S.Ch.—2, which means that the checks extend two centimeters deep from the surface of the log.

(e) *Rotten knots*.—This defect shall be described in the same manner as cat face, as R.K.—2 or R.K.—(1/4)/2, as the case may be.

(f) *Wormy and unsound sap*. — These defects, if to be deducted, shall be noted simply as W. or Un.S., as the case may be, followed by the thickness of the ring affected, in the same manner as in Sun or Season Checks.

(g) *Split*.—In this defect, the dimensions of the rectangle inclosing it shall be given. Thus, Sp.—4 x 10 x 2, which means that the split is included in a rectangle 4 centimeters thick, 10 centimeters wide, and 2 meters long.

(h) *Side defects of squared logs*.—In describing side defects for squared logs under the column "Kinds of defect" in the scale book, the name and dimensions of defects should be given, thus: C.F. 10 x 25 x 3, which means that the cat face is 10 centimeters thick, 25 centimeters wide, and 3 meters long. This is necessary because the per cent of deduction is determined by the ratio of the volume of the defect to the gross volume of the squared log.

(i) *Crook*.—This defect shall be expressed in fraction of the portion of the crook thrown off by the length of the log. Example: If one meter of an 8-meter log is thrown off as a net waste of crook it will be described as Cr.—1/8.

(j) *Sweep*.—This defect in round logs is expressed by the amount of sweep in terms of log diameter as Sw.—1/12, which means that a log having a diameter of 60 centimeters, has a sweep of 5 centimeters. In squared logs, the length of the portion of the log which is estimated to cover the waste caused by the sweep should be mentioned under column "kinds of defect" in the same manner as in crook, thus Sw.—2 means that the culled length of the squared log is 2 meters and if the log is 10 meters long, the deduction is 20 per cent. As a basis of estimating waste in sweep, determine the length thrown off at both ends

of the log in the same manner as in crook, then the length to be culled is the sum of the lengths thrown off at both ends. This amount is ordinarily twice the waste of crook.

(k) *Double crook*.—This defect will simply be noted as Db. Cr.

SEC. 198. *MILL STUDIES*.—Ordinarily mill studies consist chiefly in observing how logs "open up" and how defects are cut out, as well as in checking one's judgment for defects. Special mill studies include the preparation of waste table and the determination of the per cent of deductions for particular kinds of defects with the view of establishing a general rule, or of making a practical table of deductions, as well as similar studies of a special character. They are ordinarily made on special occasions when time permits and competent men to conduct the work are available. For the sake of uniformity and in order to avoid getting results which might be misleading, detailed description of the methods of gathering data in any special study should first be approved by the Central Office before it is carried out. Data collected in these studies will be kept for permanent record.

SEC. 199. *WASTE TABLE*.—A table giving the average per cent wasted in converting into lumber logs of different diameters is known as Waste Table. Such a table is an essential equipment of every scaler because, as will be seen later, it is used in the computation of loss due to defects in connection with mill studies. It should be prepared for every sawmill. As a brief guide for its construction the following instructions are given:

(a) *Selection of material*.—Select "straight and sound" logs of different diameters. To avoid much delay in the collection of data, logs with little defects may be used provided they are tallied as if all sound.

(b) *Number of logs necessary*.—The number of logs that should be measured in any particular mill depends largely on its

size and the number of diameter classes being sawn. Ordinarily, however, 200 to 500 logs should be adequate for the purpose of this table.

(c) *Measurement of length and diameter.*—Measure the length and diameter of the log and determine its corresponding gross volume in cubic meters and board feet. The equivalent of one cubic meter in solid contents is 424 board feet. Tally the lumber that is produced from this log as it is tallied by the lumber operator. Thus, if 1-1/4" board is recorded by the operator's tallymen as 1", the forest officer conducting this study should also tally the

same as 1" board. Tally all short lengths which are tallied and utilized or sold by the operator. Dividing the tally for any log by its gross volume in board feet times 100 will give the per cent of merchantable lumber. This subtracted from 100 per cent will give the per cent of waste for that particular log. Measure logs of different species, lengths and diameters. Remember that what is wanted is a table of waste based on actual practice and not on how the lumber should have been cut. Discard the tally of logs that have been cut into special irregular order and dimension timber. The sample table below is used in the preparation of waste table.

**SAMPLE TABLE FOR PREPARATION OF WASTE TABLE**

Name of licensee or company .....  
 Date of study .....  
 By .....

Number of logs	Species	Length in meters	Diameter timeters in cen-	Gross Cubic meters	volume Board feet	Mill tally in Bd. feet	Per cent Mer- chantable	Per cent waste	Remarks
1	Tangile .....	6.1	50	1.20	509	298	59	41	.....
2	Red Lauan ....	6.1	64	1.96	831	508	61	39	.....
3	Apitong .....	6.1	78	2.92	1,238	808	65	35	.....

Approved:

.....  
 (Officer in charge)

(d) *Plotting of values obtained.*—(1) When enough data have been collected, classify the logs studied into diameter groups,

such as 32-40 cms., 42-50 cms., 52-60 cms., etc. and prepare Table I as shown below:

**TABLE I—Weighted averages of diameters and percentage of waste by diameter groups.**

Group (1) Diameter	No. of Logs (2)	Totals by Dia. Groups		Weighted Averages	
		Actual Diameter (3)	Percentages of waste (4)	Diameter (5)	Percentages of waste (6)
32-40	13	482	741	37.1	57.0
42-50	29	1,336	1,551	46.1	53.5
52-60	20	3,114	2,748	56.6	50.0
62-70	52	3,456	2,475	66.5	47.6
72-80	53	4,020	2,451	75.8	46.2
82-90	29	2,476	1,295	85.4	44.7
92-100	7	670	301	95.7	43.0
100-110	10	1,058	419	105.8	41.9
<b>TOTAL</b>	<b>248</b>	<b>16,612</b>	<b>11,981</b>	<b>67.0</b>	<b>48.3</b>

In the above table, the number of logs indicated in column 2 represents the number of logs taken in the mill studies under each diameter group. Column 3 is the sum of the actual diameters of the logs taken in the mill studies under each group. Column 4 is the sum of the percentages of waste of the logs in column 2. Column 5 is obtained by dividing column 3 by column 2 and column 6, by column 4 by column 2.

(2) Plot the values indicated in columns 5 and 6, using the average weighted average diameters in column 5 as abscissas and the average weighted percentages of wastes in column 6 as ordinates. Write down the corresponding number of logs (column 2) representing each point plotted. Connect the points plotted by straight lines in order that the trend of the curve may be better observed. Following this trend, smoothen the curve with the aid of a flex-

ible ruler, preferably steel ruler, giving weight to points represented by bigger number of logs. The curve so drawn may not, however, yet be the correct curve as its drawing is subject to personal bias. It is, therefore, necessary to check whether or not the fitting in of this curve is correct. This can be done with the use of the statistical method by which the position of the curve can be corrected or adjusted, if necessary, such that more or less the same result will be obtained even in the hands of other investigators.

(3) Divide the data into two parts. The first part consists of the data for the upper half of the curve from which the deviations or residuals are computed. The second part consists of the data for the lower half of the curve. Calculate the net deviations of the curve separately for each half, as indicated in Tables II-A and II-B.

TABLE II-A.—*Deviation Table for upper half of the curve.*

Diameter Groups (1)	Number of logs (2)	Deviation % (3)	Total deviation %	
			+	—
			(4)	(5)
32-40	13	— .2	—	2.6
42-50	20	+ .1	2.9	—
52-60	55	—	—	—
62-70	52	—	—	—
<b>TOTAL</b>	<b>149</b>		<b>2.9</b>	<b>2.6</b>

Difference = +0.3%

Average net deviation per log = +0.002%

TABLE II-B.—*Deviation Table for lower half of the curve.*

Diameter Groups (1)	Number of logs (2)	Deviation % (3)	Total deviation %	
			+	—
			(4)	(5)
72-80	53	+0.3	15.9	—
82-90	29	+0.1	0.1	—
92-100	7	—0.7	—	4.9
102-110	10	—1.2	—	12.0
<b>TOTAL</b>	<b>99</b>		<b>16.0</b>	<b>16.9</b>

Difference = —0.9%

Average net deviation per log = —0.1%



In the above Table II-A, column 3 is the deviation or difference between the percentage of waste as read from the curve and the one plotted. In reading from the curve, in this particular example, the percentage of waste of the diameter class 32-40 or 37.1 cms. (column 5, Table I) is 57.2% and the percentage of waste plotted is 57.0%. (See Plate III). The deviation therefore is -0.2%. If the point plotted is below the curve, the deviation is minus, and if above, as in the case of diameter class 42-50 or 46.1 cms., (column 5, Table I), the deviation is plus. Columns 4 and 5 are the products of column 2 (No. of logs) and column 3 (deviation %), with the corresponding plus or minus signs. Add all the plus deviations in column 4 and the minus deviations in column 5 and get the difference between their totals. The difference divided by the total number of logs in column

2 gives the net deviation per log. If the net deviation per log does not exceed + or -0.02%, the upper half of the curve may be considered satisfactory for the purpose desired. But, if it exceeds + or -0.02%, it is necessary that the upper half of the curve be adjusted by moving it up, if the net deviation is plus or by moving it down if the net deviation is minus. After such adjustment, the net deviation per log should be computed again as before until the net deviation obtained per log does not exceed + or -0.02%.

The lower half of the curve (Table II-B) is also checked and adjusted, if necessary, in the same way as explained in the case of the upper half of the curve.

(4) With the curve already corrected and adjusted by statistical method, the final waste table is prepared, as shown below:

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<p><i>Compliments of</i></p> <p><b>VIVENCIO RONQUILLO</b> Timber Licensee</p> <p>Minor Forest Products Licensee Fishpond Owner Businessman</p> <p>Address: San Jose, Occidental Mindoro</p>	<p><i>Compliments of</i></p> <p><b>VIZCAYA LUMBER &amp; TRADING COMPANY</b></p> <p>Solano, Nueva Vizcaya</p> <p><b>PEDRO TIONGSON</b> <i>Manager</i></p>

TABLE III.—Final Waste Table

Diameter Classes	% of waste read from the curve	Number of logs	Total Waste % from	
			Table Waste	Plotted Ave.
32	60.2	2	60.2	
34	59.0	2	118.0	
36	57.9	3	173.7	
38	56.8	3	170.4	
40	55.9	4	223.6	741.0
42	55.0	7	385.0	
44	54.2	4	216.8	
46	53.4	5	267.0	
48	52.7	7	368.9	
50	52.1	6	312.6	1551.0
52	51.1	6	308.4	
54	50.8	10	508.0	
56	50.2	12	602.4	
58	49.6	15	744.0	
60	49.1	12	589.2	2748.0
62	48.6	9	437.4	
64	48.1	8	384.8	
66	47.7	12	752.4	
68	47.3	8	378.4	
70	46.9	15	703.5	2475.0
72	46.5	14	651.0	
74	46.2	7	232.4	
76	45.9	12	550.8	
78	45.6	9	410.4	
80	45.2	11	497.2	2451.0
82	45.0	7	315.0	
84	44.8	8	358.4	
86	44.6	5	223.0	
88	44.4	5	222.0	
90	44.2	4	176.8	1295.0
92	44.0	1	44.0	
94	43.8	2	87.6	
96	43.6	2	87.2	
98	43.5	1	43.5	
100	43.4	1	43.4	301.0
102	43.3	2	86.6	
104	43.2	3	129.6	
106	43.2	1	43.2	
108	43.1	2	86.2	
110	43.1	2	86.2	419.0
<b>TOTAL</b>		<b>248</b>	<b>11990.2</b>	<b>11981.0</b>

$$\begin{aligned}
 & 11880.2 \\
 & + 9.2 \quad 11981.0 \\
 \hline
 & - 11981.0 \quad + 9.9 = +0.0008 \times 100 = + 0.08\% \\
 & \text{The curve checks within } +0.08\%.
 \end{aligned}$$

Column 1 in the above table, gives the diameters of logs studied from the smallest to the biggest diameters. The corresponding percentage of waste in each diameter as read from the curve is indicated in column

2 which is the final waste table. Column 3 shows the corresponding number of logs studied under each diameter. Column 4 shows the percentages of wastes given in column 2 multiplied by the number of logs

in column 3. Column 5 shows the actual percentages of wastes obtained in mill studies totalled by diameter classes as shown in Table I. Compare the totals of columns 4 and 5. The difference, divided by the total plotted wastes (column 5) and multiplied by 100 will give the percentage within which the curve checks. This percentage indicates how well the waste table read from the curve compares with the actual waste. This means to say that, for instance, in the example given in Table III, the percentages of wastes in the final waste table are accurate within plus 0.08%.

(e) *Submission of records.*—Submit the plotting and all the tally records to the Central Office.

(f) *Revision of waste table.*—The waste table should be revised whenever there is a radical change in lumber manufacture and change in the efficiency of machineries and men.

(1) To properly determine the utilization of a mill, simply find the average diameter of the logs being sawn in the mill and look up in the waste table, the waste corresponding to this average diameter. Subtract this from 100 and the result is the per cent of utilization of the mill if all the logs sawn were "straight and sound." But since this condition cannot be obtained in practice because all logs invariably contain defects of various proportion, the expected utilization of the mill in actual operation should never equal or exceed the utilization determined from waste table study but it will always be smaller and the variation will depend on the character and amount of defect.

(2) To determine this actual utilization, it is necessary as a matter of check that after the waste table is made for any mill, a scale of all logs being sawn every day for about a week's time be conducted. The total tally of the mill for the period divided by the total net scale of all logs actually sawn times 100 will give the approximate average actual utilization of the mill. The

above procedure of obtaining utilization is applicable only to mills where scaling is done by forest officers. In the case, however, of sawmills without government scalers, to obtain the average actual utilization of the mill for the purpose of determining whether or not some logs had not been scaled or properly invoiced, the mill tally should be divided by the gross scale times 100. The sawmill operator in this case is not supposed to make deductions for defects in his logs and therefore the scale on which he pays forest charges, represents the gross scale. (Important Provisions of the Present Scaling Law, Sec. 263 of Act 466.)

1. All timber shall be measured and manifested in the round or square form before being sawn or manufactured.
2. Volume of round timber = area of small end  $\times$  length, average diameter exclusive of bark for logs 8 meters or less in length. For logs more than 8 meters long the middle diameter or average of two end diameters shall be used.
3. If log in round, legally cut, is measured and manifested by a Forest Officer the Director of Forestry shall make a deduction for natural defects; if Director's decision is appealed, the Department Secretary's decision shall be final.
4. Volume of square timber = average cross section  $\times$  length to which 40% shall be added to the volume for loss in squaring.
5. If square timber is cut under license is measured and manifested by forest officer, the Director of Forestry shall make allowance for natural defects; if his decision is appealed, the Department Secretary's decision shall be final.
6. If sawn or manufactured timber is found not manifested in accordance with the provisions of law, the corresponding forest charges shall be

assessed on twice the volume of actual contents of such sawn or manufactured timber.

**SEC. 200. METHOD OF MILL STUDIES FOR DETERMINING LOSS DUE TO DEFECTS.—**

There are two methods which may be used in determining the amount of loss due to defects in logs under observation in the mill. These are: (1) by tallying the merchantable lumber cut out from the log and (2) by tallying the defect itself. They are in practice supplementary—one is applica-

ble to very defective logs and the other to relatively sound timber.

(1) The tallying of merchantable lumber is used when the defect cannot be easily isolated or tallied as is often the case when a log has several defects. Care should be taken in using this method so that the merchantable lumber is tallied in accordance with the method being used by the sawmill operator. The following forms for recording observations and measurements should be used in case the merchantable lumber is tallied.

Mill study record by .....  
 Name of mill ..... Date .....

No. of logs	Species	Diameter in cms.	Length in meters	Description of defects	Gross M/3	volume Board feet	Mill tally in Bd. ft.	Per cent merchantable	Per cent		Scaler's estimate of defects	Remarks
									due to waste (from waste table)	loss due to defects		
1	Tangile	46	3.8	Swp 1/3 Bc. 11	.63	267	95	36	30	34	31	.....
2	White lauan	50	4.5	C.R. 30	.88	373	114	31	25	44	46	.....
3	Apitong	60	8.0	H.Ch.10	2.26	958	780	81	15	4	5	.....

In describing a defect, the size given should include the allowance necessary to properly inclose all the irregularities of the defect. The value of the data secured as a permanent record depends upon the accuracy in which the tally and measurements were taken.

(2) The second method consists simply in tallying the defective pieces to actual dimensions such as, 1-1/8" x 6-1/2" x 20 ft., etc., as they are cut out from the log. If it happens for some reason or other that a defective portion is included in a merchant-

able piece, estimate or measure, if possible, the dimensions of this portion and add its volume to the tally of defects. This method has the following merits: (a) it does away with the use of the waste table, which is not free from inaccuracies; (b) it reduces the number of pieces to be tallied in one log, thus minimizing the error in tallying; and (c) it gives the inexperienced scaler a direct and better impression of the effect of defects on the volume of logs. For this method, the following table is used in recording the data obtained:

Mill study record by .....  
 Name of mill ..... Date .....

No. of logs	Species	Diameter in cms.	Length in meters	Description of defects	Gross M/3	volume Board feet	Tally of defects in Bd. feet	Per cent of defect	Per cent of estimated defect	Remarks
2	Apitong	56	5.6	H.Ch.16	1.38	585	60	10	10	.....
3	Tañige	86	4.4	B.C. 20	2.56	1,085	86	8	7	.....

**SEC. 201. OBSERVANCE OF MILL STUDIES.**—Mill studies should be conducted frequently by scalers in accordance with the following instructions:

(1) Scalers working in the woods should make mill checks at least once a month. Officers in charge of scaling stations should, however, see to it that his scalers undertake mill checks as often as, in his opinion, there is need for them.

(2) Officers in charge should personally take charge of all mill studies undertaken by his scalers.

(3) Officers in charge should see to it that in their actual scaling work scalers under them make deductions for natural defects exactly according to the results obtained from their mill studies.

(4) The minimum length of any merchantable piece tallied must be the same as the shortest length utilized by the operator. For example: If the operator utilizes two-foot pieces, this length should be considered merchantable in scaling and included in the tally in connection with mill studies.

(5) Tally according to the location of the defects and the method used by the scaler in allowing for them, which method is influenced by the minimum merchantable length used by the operator, but in all cases where a mill does not utilize short length, six feet (1.83 meters) will be considered the minimum merchantable length, that is, if a sound log is to be cut into a length less than 1.83 meters (six feet) on account of defects, the whole log should be culled.

(6) All scalers permanently assigned in scaling stations should endeavor to make waste table for their respective mills, conduct studies to determine the actual mill utilization as well as studies for the determination of waste due to each of the following: sawkerf, slabs, trimming, edging and allowance for shrinkage.

**SEC. 202. MEASURING, NUMBERING OF LOGS AND BOOKS AND STAMPING LOGS.**—

(a) *Necessity of accurate measurement.*—

Care must be taken in getting the length and diameter of every log scaled as well as in judging defects. This is important for the reason that the good work of a scaler in judging defects can easily be offset by inaccuracies in log dimensions due to his carelessness or indifference. Conscientiousness in the work has considerable influence in the accuracy of these measurements. The scale of a log is influenced by the scaler's judgment of defect as well as his measurements of length and diameter. It is necessary, therefore, that he should have not only a good judgment of defects but also that he be accurate in taking the length and diameter of every log that he scales.

(b) *Measuring log length and diameter.*—(1) *Log length.*—Log lengths for either round or squared timber will be measured to the nearest decimeter. Example: If the exact length of the log is 4.14 meters, record it as 4.1, but if it is 4.15 meters, record it as 4.2 meters. In taking the length, the scale stick should not be slanted away from the log, otherwise, an overmeasurement would result. Also the end of every meter length on the log should be fixed in sight until the 100-centimeter mark of the scale stick is on it for the measurement of the succeeding length. But logs with deep undercuts will be measured for length from a point midway between the extreme end of the undercut and the sawcut line (Fig. 14—Plate I). In the case of noosed or snipped logs, full length will be taken (Figs. 15 and 16—Plate I).

(2) *Log diameter.*—Diameters of round logs will be measured to the nearest even centimeters. Example: If the exact diameter is 36.9 centimeters, write it down as 36 centimeters, but if it is between 37 and 38.9 centimeters, consider it as 38 centimeters. If the length of the log is more than 8 meters, diameter measurement will either be taken at the middle point, which must be determined as accurately as practicable, or the average diameter of the two

ends of the log. Care must be taken by the scaler when taking the middle diameter to extend the end of the scale stick far enough out towards one side of the log so that the inside line of the scale hook coincides with the line of sight perpendicular to the central axis of the log and tangent to its surface. A check should be taken occasionally on the above measurement by measuring the diameter at the small end and allowing for a reasonable taper, or by using the "Tamesis folding caliper," if available. If there is an unreasonable discrepancy between the two figures obtained the measurement at the middle point should be repeated. Allowance will, of course, be made for the thickness of the bark. If the cross section of the log is not round, take the average of the long and short diameters, which should be at right angles to each other. In the case of a crotch or any abnormal swelling at the scaling end of the log, the diameter should then be taken below the swelling.

For square timber the mode of taking the side dimensions is as follows: Measure the average width and average thickness regardless of the length of the timber. If a side of the square timber is narrower on one end than on the other, take the average width of the two ends or measure at the middle point. However, whether the timber is a perfect square or not two opposite sides must invariably be averaged and the result taken as the basis of computing the volume. Similar procedure must be followed in the case of the other two opposite sides. The average width and thickness will be recorded to the nearest centimeter, odd or even. Manufactured timber, such as banca, ties, etc., will also be measured to the nearest centimeter, odd or even. Example: If the average width is 37 centimeters, write it down as 37 and not 38, as is the rule when measuring the diameter of a round timber.

(c) *Common errors in measuring.*—

(1) *Log length.*—The common errors in

measuring log lengths which should be avoided are given below:

a. Scale stick not laid flat on the surface of the log. Figure 12, Plate I shows the wrong way of measuring the length of a log; while Fig. 13, the correct way.

b. Scaler following a zigzag line instead of a straight line on the surface of the log.

c. Scaler not fixing his eye on the point where his scale stick ends and from which his next measurement begins. Thus if this point is missed, there may be either under-measurement or overmeasurement of length.

d. Not holding the scale stick constantly at the 100-centimeter mark. To avoid this a notch should be made on the 100-centimeter mark of the scale stick.

(2) *Log diameter.*—The most common errors in measuring diameters which should also be avoided, are the following:

a. In case the diameter is taken at the middle point of the log, not placing the scale stick in such a way that its hook end meets exactly the imaginary line tangent to the log and perpendicular to its central axis; or not making the reading on the scale stick at the exact point where similar tangent line on the other side of the log meets the scale stick.

b. Misplacing the scale stick on the log, that is, when the middle diameter is to be taken so that it is not perpendicular to the central axis of the log.

c. Not getting the diameter exactly at the middle point of the log.

d. Not giving proper allowance for thickness of bark.

e. Not taking two measurements perpendicular to each other in case the cross-section of the log is not round.

(d) *Numbering of logs with crayon.*—

(1) *All scaled logs must be numbered.*—Every log shall be numbered with a marking crayon as soon as scaled, even though it is to be sawn immediately. The number must be written at least at one end of the log. In the case of bucked logs from one single tree with the ends laying pretty

close together, one number at the butt end, which is usually open, would suffice but the other logs must invariably be numbered consecutively on the scale sheet. The same method of numbering should be adopted on unbucked trees, using consecutive numbers for each log beginning from the butt. (Unbucked trees are usually marked into two or more log lengths. Logs scaled in the log pond or log deck should also be numbered as they are scaled. Cull log will, in addition to its number, have the word "cull" written at its end. The mark "cull" at the end of every cull log is made simply for the information of the licensee or lumber operator concerned. Cull logs will, however, not be marked with marking hatchet.

(2) *Separate numbering by species.*—Each species will be numbered independently beginning from one. Every regular scaler using a separate scale book will have his own numbering independent of the other scalers. A scaler scaling in two or more set-ups, should number the logs in each set-up independently. The number of the logs in the scale book should invariably correspond to the number of the logs in the field. The numbering should change with the change of set-ups, that is, at the beginning of the set-up the logs scaled will again start from number one for each species.

(e) *Numbering of scale books.*—The numbering of scale books shall be consecutive, beginning from number 1 each year.

(f) *Stamping of logs with B.F. marking hatchets.*—(1) Every scaler is provided with official marking hatchet with registered number and he shall see to it that every merchantable log scaled by him is stamped either at one end or the sides. Scalers must be sure that the hatchet marks are visible and the number legible.

(2) Logs under investigation by district foresters, inspectors from the Manila Office, administrative officers and check-scalers shall be stamped with a lumber Inspector's hatchet, with which they will be provided.

Also, logs, squared or manufactured timber, and lumber invoiced by licensees or non-licensees and shipped to Manila, and which are checked by forest officers in cooperation with the Bureau of Internal Revenue shall be marked with a lumber inspector's hatchet by the forest officer concerned.

SEC. 203. LOG RULES.—Every scaler must be thoroughly familiar with the different log rules commonly used by operators in the Islands. A comparison table of the most common log rules used is supplied every scaling station for reference. Scalers are expected to know the different principles upon which those rules are based. It will be noted that the different rules attempt to give the lumber volume in board feet for logs of different diameters and lengths, whereas the Bureau of Forestry Rule gives the total solid cubic contents of the log. The Log Rules most commonly used in the Islands are Doyle, Scribner, Doyle-Scribner, Scribner Decimal C, Spaulding and International.

(a) *Doyle rule.*  $(D-4)^2/(4)^2 \times L$ . D is diameter in inches. L is length in feet. Four inches is the allowance for slabs. One-fourth of the square timber is deducted for sawkerf. It is easy to see that whereas the allowance for slabs would be too big for small logs, it would be insufficient for large size logs, hence the large over-run for small logs. It may be noted that the method of allowing for slabs seems to have been premised on the assumption that this waste could be taken off from four sides. As a matter of fact, this waste is ordinarily distributed as a collar all over the surface of the log. Any error in the estimate for loss in slabs would directly affect the allowance given to sawkerf. If the allowance for slabs is too small the intended deduction for sawkerf would likewise be small and the reverse is true.

(b) *Scribner rule.*—Scribner rule is a diagram rule constructed for 1-inch lumber and one-fourth inch sawkerf. There is bigger allowance given to large logs than to

small logs. This results in a large over-run for big size logs over 28 inches in diameter. It gives values for logs from 12 to 44 inches in diameter only.

(c) *Doyle-Scribner rule*.—The Doyle-Scribner rule, which gives Doyle values up to 28 inches and above that the Scribner values, is intended to avoid the inconsistency of the two rules.

(d) *Scribner Decimal C.*—The Scribner Decimal C. rule is the log rule used by the U.S. Forest Service. It is a modification of the Scribner log rule since it adds values for logs below 12 inches and above 44 inches and the values throughout the rule are given in tens.

(e) *Spaulding log rule*.—The Spaulding log rule or California rule is a diagram rule constructed for 1" board allowing 11/32" for sawkerf. It gives values from 10 to 96 inches in diameter and 12'-24' long. A formula (McKenzie formula) for this rule has been worked out as follows:

$$\text{B.M.} = [(1-.266) \frac{\pi D^2}{4 \times 12} - 2] L.$$

(f) *International log rule*.—It is a formula rule constructed with an allowance of 1/16" for shrinkage per 1" board and 1/4" sawkerf for seasoned lumber, or 5/16" sawkerf for green lumber. The formula is  $\text{B.M.} = (.22D^2 - .71D) .904762$  for 4' sections.

**SEC. 204. LOG INVENTORY.**—(a) *Woods inventory*.—Where scaling is done in the cutting areas, monthly woods inventory is determined by subtracting from the total volume of the logs scaled during the month the volume of the logs delivered to the mill. However, with this method error accumulates from month to month for some logs scaled as saw logs may be abandoned or are used as firewood or construction timber. An actual count of abandoned logs should therefore be made in areas that are definitely abandoned to correct the woods inventory. The volume involved in this woods inventory is obtained by multiplying

the average individual log volume of all the logs scaled during the month by the number of logs. In an area or set-up where no log has as yet been removed, the total scale of the logs in the area is, of course, taken as the inventory.

(b) *Log pond inventory*.—Where scaling is done at the mill, the log pond inventory should be taken by actual count every end of the month. The average volume of the log to be used in computing the total approximate volume of the logs in the pond or the inventory, may be determined by scaling actually in the pond several representative logs; the care in selection influences greatly the accuracy of the inventory.

**SEC. 205. SCALING OF ABANDONED TIMBER.**—(a) *Abandoned logs*.—If the place of scaling is at the mill or at any other place outside of the logging operations, the cut-over areas should be gone over by the local scaler for abandoned timber as frequently as possible or as soon as the logging operations are terminated. Only merchantable logs, as defined under the caption "Merchantable Log" in this Manual, will be scaled. Inspection should be made each month, if practicable. The performance of this work should not be delayed until jungles of brush or climbing bamboos have already started in the areas to be covered. It is necessary that a forest officer when scaling abandoned timber should be accompanied by an authorized representative of the licensee. It should be emphasized to the operators, in this connection, that the purpose of this representative is primarily to let them know where the abandoned logs are and to give them a chance to present on the ground their objection, if any, to any log scaled against them. It is obviously to the advantage of the party concerned to send a responsible representative in every case. If regular scaling work is done in the woods, the amount of scaled abandoned timber will be shown in the monthly scale report under "Remarks." These data are usually required by lumber companies for



their own information: Example: During the month 121 abandoned logs with 266.42 cubic meters, which were scaled in previous months, were counted.

(b) *Abandoned tops.*—All tops left in the woods will be scaled, regardless of length, provided they are at least 30 centimeters in diameter at the small end and are not more than 66-2/3 per cent defective, if they are first group pieces; or not more than 50 per cent defective, if they belong to any of the lower groups.

(c) *Invoicing abandoned timber.*—All abandoned timber including wasted tops and stumps will be manifested in an ordinary auxiliary invoice (B. I. R. Form 14.04) and should not be included in the monthly scale report (B.F. Form No 1-S). Likewise, all timber cut in violation of the timber license or license agreement, such as, below diameter limit or timber cut without license, should be reported on auxiliary invoice. The corresponding scale sheets with the summary thereof, for timber invoiced, should be attached to the copy of auxiliary invoice for the Director. As much as possible the column "Part of Tree" in the auxiliary invoice should be properly filled as required in this form for the information of the licensee and this Office. In addition, explanation of the cause why the logs were abandoned, or cut below the diameter limit as the case may be if known, should be mentioned under "Remarks" to be inserted at the bottom of the invoice.

**SEC. 206. STANDING TIMBER SEVERELY DAMAGED IN LOGGING.**—Trees damaged seriously in logging will be scaled only when they satisfy the following conditions:

(1) Each tree must contain at least two 5-meter logs, the second log of which must have a top diameter of not less than 30 centimeters.

(2) The tree must be fairly straight and sound and that it will not likely split or break when cut down.

(3) If the damage was due to carelessness on the part of the logger, broken tim-

ber, still standing, should be scaled regardless of the above conditions, provided it is not more than 66-2/3 per cent defective if it belongs to the first group and not more than 50 per cent defective if it belongs to the lower groups. It should, however, be remembered that inasmuch as many trees are unavoidably destroyed or injured in the process of felling and bucking and yarding, care should be exercised in the enforcement of this regulation so that no injustice may be done to the operator.

**SEC. 207. STANDING TIMBER IN AREA LEFT UNLOGGED.**—Patches of standing timber which are sometimes left unlogged or only partially cut over should be surveyed and a sketch submitted showing their definite location with respect to known points in the concession map. A 100 per cent estimate of the volume of the timber above 40 centimeters in diameter, breast height, should be made. A flat percent of deduction determined from the quality of timber in the surrounding areas, which have already been logged over, will be applied in deducting for natural defects. A report should accompany the sketch and should contain information on the following points: (1) Area; (2) Total net volume; (3) Reasons why it was abandoned or only partially logged over as the case may be; (4) Will the abandonment of the area be beneficial to the interest of the Government? Is it good for watershed or soil protection, or needed as seed trees? Is it contiguous to another body of timber?; (5) Any other information that may help the Central Office make decision in the matter; (6) Recommendations.

**SEC. 208. SPECIAL TIMBER PRODUCTS SUCH AS TIES, FIREWOOD, PILING, CONSTRUCTION TIMBER, ETC.**—(a) *Method of scaling ties.*—For the purpose of collecting forest charges, ties used in lumbering operations will simply be counted by the scaler and the volume of an average tie determined in order to obtain the total volume. They should, of course, be listed by species

and groups. The mode of measuring and manifesting ties scaled by a forest officer and cut by ordinary licensees or concessionaires, the timber felled by whom is scaled regularly by a government scaler, will be as follows: If a tie is hewn or sawn on one or more sides but it could be measured in the round, it shall be so scaled and invoiced; otherwise, it will be manifested as "Manufactured timber" with the necessary surcharge of 100 per cent. In the latter case, of course, no allowance for defects shall be given. Average per cent of deduction for natural defects on ties scaled in the round may be applied for each group under one invoice.

(b) *Firewood, construction timber, piling, etc.*—Firewood used for donkey engines and locomotives obtained from merchantable logs should be scaled before they are split, giving due allowances for all natural defects. Construction timber, piling, etc., should likewise be given deduction for heart checks and all other natural defects whether scaled in round or squared form.

(c) *Timber without deduction for natural defects*—Manufactured timber shall not be given deduction for natural defects. All timber cut in violation of the timber license or license agreement such as cutting below the diameter limit or timber cut without license shall, likewise, not be given allowance for defects.

SEC. 209. INSTRUCTION FOR CHECK SCALING.—(a) *Check-scalers.*—Only authorized check-scalers should perform check scaling work. Officers in charge of scaling stations, who are not authorized check-scalers, shall, however, continue to supervise and check as usual the work of the scalers under their immediate charge. It is the policy of the Bureau to assign, as soon as men are available, one properly trained check-scaler in each district to supervise the scaling work. If practicable the gathering of important and valuable data, such as special mill studies, inspection of sawmills and log-

ging operations, lumber trade investigation, cruising of the concession, etc., will be conducted under the check-scaler's supervision. The following should serve as a guide to authorized check-scaler's in their work:

(1) The work of all regular scalers in the mill inspected should be checked.

(2) B.F. Form No. 10-S should be used in check scaling.

(3) Each scaler should be checked on not less than 25 logs selected at random.

(4) The check-scale shall be made in the presence of the scaler and his errors pointed out right on the ground after the check-scale is made.

(5) The "Tamesis Folding Caliper," if available, will be used by the check-scaler in checking the middle diameter of long logs.

(b) *Allowable error in check scaling.*—To judge the efficiency of scalers, standard allowable errors in the measurement of length and diameter, and deduction for defects have been adopted. Thus, if a scaler makes an error on five measurements in lengths out of 25 logs, outside of the allowable error, his rating in length measurement shall be 80 per cent. The same procedure shall be applied in checking the diameter measurement and deduction of defects. To determine the final grade of the scaler, take the average of his ratings for length, diameter and deduction. It is not enough to judge the correctness of a scaler's work solely on the basis of the above grades. The total merchantable volume obtained must also be taken into consideration for after all, it is what the licensee or concessionaire pays for. A scale that varies more than 5 per cent, plus or minus, from the check-scale can hardly be called a satisfactory scale, even if the measurements of length and diameter were made accurately and the judgment for defects was within allowable errors. A scaler should be as careful and accurate as possible regardless of allowable errors. The standard set for allowable errors are the following:

- (1) For length measurement—
- |  |              |
|--|--------------|
| a. Up to 4.9 meters long, allowable error .....    | None         |
| b. 5.0 meters long, allowable error .....          | + .1 m.      |
| c. 5.1 to 8.0 meters long, allowable error .....   | + or - .1 m. |
| d. 8.1 to 12.4 meters long, allowable error .....  | + or - .2 m. |
| e. 12.5 meters long, allowable error .....         | { - .2 m.    |
|  | { + .3 m.    |
| f. 12.6 to 17.4 meters long, allowable error ..... | + or - .3 m. |
| g. 17.5 meters long, allowable error .....         | { - .3 m.    |
|  | { + .4 m.    |
| h. 17.6 to 20.0 meters long, allowable error ..... | + or - .4 m. |

The above is based on the allowable error of 1 per cent for logs 8-meter long and below, and 2 per cent for logs over 8 meters long.

- (2) For diameter measurement—
- a. For logs not over 2 meters long:
- |  |               |
|--|---------------|
| Up to 48 centimeters diameter, allowable error . | None          |
| 50 centimeters diameter, allowable error .....   | + 2 cms.      |
| 52 to 148 centimeters diameter, allowable error  | + or - 2 cms. |
| 150 centimeters diameter, allowable error .....  | { - 2 cms.    |
|  | { + 4 cms.    |
- b. For logs more than 8 meters long:
- |  |               |
|--|---------------|
| Up to 32 centimeters diameter, allowable error ... | None          |
| 34 to 98 centimeters diameter, allowable error .   | + or - 2 cms. |
| 100 centimeters diameter, allowable error .....    | { - 2 cms.    |
|  | { + 4 cms.    |
| 102 to 150 centimeters diameter, allowable error . | + or - 4 cms. |

The above is based on the allowable error of 2 per cent for logs not more than 8-meter long and 3 per cent for logs over 8 meters long.

- (3) For deduction of defects—
- Two per cent (+ or - 2%) for center defects only except butt rot.
  - Five per cent (+ or - 5%) for butt rot and other defects combined.
  - Five per cent (+ or - 5%) for center and side defects combined.
- (4) For total merchantable volume—
- Five per cent (+ or - 5%).

SEC. 210. CHECK ON SAWMILL UTILIZATION.—(a) *Utilization of previous and current year.*—If a mill is inspected for the first time, the utilization for the years previous to that during which the inspection was made should be checked besides the utilization from the beginning of the current year to the time of inspection. If any irregularity is found in the per cent of utilization of the mill, a detailed study of the probable cause or causes of such irregularity should be made and if found to be due to improper deduction of defects the scaler should be given instructions accordingly. In case the low per cent of utilization was due

to a high percentage of waste in the mill, it would not suffice to merely state that the mill was wasting a great deal. Mill studies should be made to determine the actual amount and sources of wastes. If possible, make separate studies on waste due to sawkerf, trimming, shrinkage, slabbing and edging.

(b) *Class A and B sawmills.*—If a class A or B sawmill is visited for the first time where no mill studies have been made, the scaler should conduct mill studies to determine the per cent of utilization of the mill. If the utilization of the mill based on logs scaled, mill tally, lumber in the yard, etc.,

is much higher than the result of the utilization by the study of the scaler, it means that considerable number of logs have been sawn without being scaled and manifested. A complete and detailed report of why a low or high utilization was obtained and

causes which brought about the result should be submitted. A sample report for a Class B sawmill the operation of which was checked from February 1 to December 31, 1930, is given as follows:

### LOG CHECK

Items	M/3	Board feet
Unsawn logs at the beginning of the period (February 1, 1930) .....	None	None
Logs invoiced by the company February to October, 1930 .....	1,386.88	588,037
Logs scaled by Ranger De la Cruz November to December 31, 1930 .....	1,294.49	548,864
Logs from other licensees .....	None	None
<b>Total logs handled during the period</b>	<b>2,681.37</b>	<b>1,136,901</b>
Logs shipped to other Provinces or countries	None	None
Unsawn logs at the end of the period December 31, 1930 .....	137.63	58,355
<b>Total logs actually sawn .....</b>	<b>2,543.74</b>	<b>1,078,546</b>

### LUMBER CHECK

Items	M/3	Board feet
Lumber sold and used in the mill February to December, 1930, as shown by record of sales .....	2,250.35	954,148
Lumber left at the end of the period December 31, 1930 .....	232.56	98,605
<b>Total lumber available during the period .....</b>	<b>2,482.91</b>	<b>1,052,753</b>
Lumber at the beginning of the period (February, 1930) .....	None	None
Mill tally as per record of sales and inventories .....	2,482.91	1,052,753
Utilization, per cent (1,052,753 ÷ 1,078,546) .....		97.6%

(c) *Determination of log sawn but not invoiced.*—If the actual mill utilization from the mill studies conducted by the scaler for several days was found to be 52 per cent,

it is evident that there had been considerable number of logs sawn without being scaled and manifested. This excess may be determined as follows:

Items	Groups in cubic meters				Total cubic meters
	First	Second	Third	Fourth	
Log pond inventory February 1, 1930 .....					None
Log pond inventory Comp. by gr. . . .	None	None	None	None	None
Record of logs invoiced by the Co. February to October, 1930 .....	63.08	262.91	941.58	119.31	1,386.88
Logs scaled by Ranger De la Cruz November to December, 1930 . . .	8.37	347.90	790.76	147.46	1,294.49
Total logs manifested .....	71.45	610.81	1,732.34	266.77	2,681.37
Log pond inventory December 31, 1930 .....					137.63
Log pond inventory computed by groups .....	3.72	31.38	88.91	13.62	137.63
Manifested logs actually sawn .....	67.73	579.43	1,643.43	253.15	2,543.74
Mill cut during the period (1,052,753) board feet .....					2,482.91
Mill cut computed by group .....	67.04	566.10	1,603.96	245.81	2,482.91
52 per cent of logs sawn .....	35.22	301.30	854.58	131.64	1,322.74
Lumber sawn not manifested .....	31.82	264.80	749.38	114.17	1,160.17
Equivalent in logs of the above .....					
"Lumber sawn not manifested" based on 52 per cent utilization .....	61.19	509.23	1,441.12	219.56	2,231.10
Regular forest charges to be collected	152.98	763.85	1,441.12	109.78	2,467.73

If the log pond inventory and the mill cut during the period as shown in the example above were not segregated in the licensee's or company's record, the amount for each group may be calculated by using as a basis the ratio in percentage of the different groups to the total volume of the total logs manifested and logs actually sawn.

(d) *Non-license sawmills.*—Forest officers should endeavor to check also the operation of non-license sawmills to see that all logs sawn were duly invoiced and the forest charges due thereon have been paid. The procedure to be followed is the same as that provided in the checking of class A and B sawmills.

(e) *Formula in determining utilization.* The following formula may be used in determining the utilization of a mill when

other data or figures are lacking or are unknown: ..

Mill tally Cu. M. + (<sup>a</sup>Per cent of Waste × Gross Vol.) = approximate net scale (Cu. M.).<sup>b</sup>

(f) *Frequent check of sawing necessary.*—Mill not provided with permanent scalers should be visited as often as practicable and as much of the data required in the above reports as can be obtained should be secured. During these visits, it is especially important to check the logs manifested with the mill tally and lumber sales. The outline given above should serve as a guide for making the required check and the submission of the necessary report. The logs manifested by the operator as they appear in their books should be checked with

<sup>a</sup> This is the per cent of waste that corresponds to the average diameter of the logs sawn during the period of checks in the Waste Table for the mill.

$$\frac{\text{Mill tally}}{\text{Calculated net scale}} \times 100 = \text{Correct per cent of utilization for the period covered.}$$

the record of payments in the local treasurer's office.

(g) *Period to cover check.*—When no definite data can be secured for the log or the lumber inventory at the beginning of the period checked, the check should be made for not less than six months to a year's time in order to reduce the error in computed percentage of production.

(h) *Prescribed sawmill record.*—Forest officers shall also see to it that sawmill operators properly record their scaled logs on B.I.R. Form No. 499 and keep a mill tally of the lumber produced giving species, dimensions and board feet content; (B.I.R. Form No. 403) a record of lumber or log sales (B.I.R. Form No. 405) as well as monthly abstract of sawmill invoices, (B.I.R. Form No. 405-1/2) in accordance with Bureau of Internal Revenue Regulations. These are necessary to facilitate the checking of irregularities committed by sawmill operators and the detecting of timber sawn without being manifested. Many new sawmill operators do not know of these forms and they should be helped as much as possible to secure samples of them from the treasurer's office or from the Collector of Internal Revenue for printing and use in their mill.

SEC. 211. LUMBER GRADING AND INSPECTION.—(a) *General instructions.*—The following general instructions governing the inspection of lumber, flitches, ties and logs for private parties are given for the guidance of forest officers:

(1) Any request for inspection may be made direct to the local forest station without passing thru the Central Office. It must always be in written form and should contain (a) place where inspection is to be made; (b) species, amount and kind of product to be inspected; (c) name of party requesting the inspection; (d) name and address of the consignee; (e) name of ship; (f) date of shipment; (g) kind of inspection desired; (h) complete and explicit statement of the specifications and special grades

required, if any. Verbal requests shall not be considered.

(2) A certified check or postal money order payable to the Director of Forestry, Manila, covering the fees for the amount of lumber or timber to be inspected, must accompany each request and same should be remitted at once to the Central Office, where the necessary official receipt will be issued. The following schedule of fees is in effect at the present time:

#### CHARGES

Railroad ties, lot not exceeding 1,000 pieces . . . . .	each	₱ .03
Railroad Ties, over 1,000 pieces . . . . .	do	.02
For grading or identification of each 1,000 board feet . . . . .	do	1.50
For the identification and scaling of logs, either squared or round, for each 1,000 cubic feet of fraction thereof . . . . .	do	6.00
For tallying lumber not exceeding 10,000 board feet . . . . .	do	10.00
For each additional 1,000 board feet or fraction thereof . . . . .	do	.75

Charges are computed on the total amount of lumber handled, including rejects. Transportation and subsistence of the inspector when away from his official station shall be paid in addition to the above charges. "Fraction thereof" simply means that for any amount less than 1,000 cubic feet or 1,000 board feet, a charge of ₱6 and ₱.75, respectively, will be made.

(3) It should be emphasized to the lumber men that all requests for inspection should be made well in advance so as to be in the hands of the nearest government inspector at least two weeks before the date of shipment. This is absolutely necessary for proper arrangement of the work by this Bureau. Failure to make such advance application may subject the shipper to the risk of this request being turned down.

(4) As soon as possible after the inspection

(5) The party making the request must:

tion is made, the bill of expenses must be submitted by the inspector to the Manila office. A model for this bill is given as follows:

**EXPLANATION**

Date 1926	(Give name of party to be charged, actual dates spent in inspection, etc.)	Amount
July 17	Insular Lumber Co. for cost of inspection fees on 88,822 board feet of lumber from July 7, to 9, 1926, at ₱1.50 per 1,000 board feet	₱133.23
	Insular Lumber Co. for transportation and per diems in connection with the above inspection, itemized as follows:	
	Expt.      Date	
	Ranger A. Castillo . 8.25 for July 6-11	
	Ranger M. Eugenio . 5.00 for July 7-10	13.25
	Total	₱146.48

(5) The party making the request must:

a. Provide suitable space and means for segregating the inspected product if it is not to be loaded immediately.

b. Provide adequate labor for taking care of the same as it is inspected.

(6) All certificates of inspection issued must be prepared on B.F. Form No. 4-S. This applies to the inspection of lumber, fitches, ties, and logs. Except as otherwise herein specifically provided, only official names of species and official grades are allowed on these certificates. The statement therein of the amounts of lumber or timber handled must not include rejects. Only authorized Bureau of Forestry grading rules shall be used.

(7) Except in cases where the inspection work involved does not require the services of an authorized lumber inspector and, being of such a nature, the work can be performed by ordinary forest officer, inspectors will sign the certificates of inspection with their title as Authorized Lumber Inspectors.

(8) Certificates of inspection shall be prepared in sextuplicate. The duplicate may be delivered immediately to the party requesting the inspection, and forwarded with the shipment. The original, triplicate and quadruplicate must be forwarded to Manila for the signature of the Director. The sextuplicate will remain at the local station for his files while the quintuplicate

will be forwarded to the district office.

(9) It should be understood that the inspector certifies only to the amount and grade of lumber at the time of inspection. He is not responsible for lumber as shipped unless tallied on board.

(10) This Bureau has neither the authority nor the desire to impose its inspection on seller or buyer. Its inspection work is done only as a matter of cooperation and its decision is not final except in the case of inspection for live-borers of lumber to be shipped to Australia.

(11) All work in tallying must be recorded on B.F. Form No. 3-S. In the absence of any special instruction from the party requesting the inspection, a summarized statement of the tally by grade and species similar to the following must be prepared to accompany each copy of the certificate issued:

**STATEMENT OF LUMBER INSPECTED  
FIRST AND SECONDS**

Dimensions	Number of pieces	Board feet
1" × 6" × 10' . . . . .	10	50
12' . . . . .	36	216
Total .	46	266
1" × 7" × 14' . . . . .	1	8
20' . . . . .	3	36
22' . . . . .	3	39
etc. . . . .	.....	.....
Total .	7	82

(12) In the inspection for "live-borer" or for grade, the party requesting the inspection must furnish the Inspector with a tallyman for the work.

(13) Inspection at night time is not permitted.

(b) *Inspection of lumber for Australia.*

(1) *Seasoning of.*—Lumber shipped to Australia must be air-dried on stickers for at least 90 days, or must be subjected to steaming process in a dry kiln for one to two hours followed by drying from 10 to 15 days at a constant temperature of 150 degrees Fahrenheit. This rule does not apply to "FAS" lumber without sapwood.

(2) *Sapwood lumber and stacking of.*—No sapwood lumber shall be passed for shipment to Australia unless same is kiln-dried immediately before shipment in the manner indicated above. In case immediate shipment cannot be made due to the limited capacity of the dry kilns, lumber so treated may be stacked at the end of a wharf, at a distance of at least 1,500 feet from land.

(3) *Date on lumber piles.*—Local lumber operators should be advised to adopt a system of recording on the lumber piles themselves, the date when piling began and when finished, in order to facilitate, for mutual advantage of both parties concerned, the verification by the inspector of the 90-day period of air-seasoning requirement. The local inspector as a responsible official, should check up these piling dates as frequently as is necessary. He should, in the case of kiln-dried lumber, check up particularly on the required temperature and number of days that the lumber must be dried in the kilns. When the Inspector comes from a distant place or town other than that in which inspection is to be made, he may be able to verify in a general way from its appearance, the length of time during which the lumber had seasoned, at time of inspection, but under such circumstance he should invariably obtain an affidavit from the shipper certifying to the effect that the lumber to be shipped has been seasoned in

accordance with the requirements of the Australian Government.

(4) *Issuance of seasoning certificate.*—If the lumber to be shipped has been seasoned in accordance with sections 1 and 2 under the heading "Inspection of Lumber for Shipment to Australia," and if such treatment has been properly verified by an authorized inspector or, in his absence, by the local officer in charge, a mere "drying" certificate, similar to the following, would suffice in order to meet the requirements of the Australian Government. This fact must be fully explained to the lumbermen so that unnecessary inspection by the limited lumber inspection personnel of this Bureau may be avoided for mutual advantage of both parties concerned. Said certificate as shown below may bear the signature and corresponding official designation of either an authorized inspector or the local officer in charge, depending on who issued it.

**TO WHOM IT MAY CONCERN:**

I hereby certify that the amount of twelve thousand five hundred seventy-eight (12,578) board feet (896 pieces) of Lumbayau, as per Company's tally, to be shipped to Australia by the Kolambugan Lumber and Development Co., on steamship "Tanda," October 28, 1926, has been kiln-dried for ten days at a constant temperature of 150° F. and otherwise treated in accordance with the requirements of the Australian Government, (or has been air-dried on stickers for over 90 days, and contains no sapwood, as the case may be).

(Sgd.) .....  
*Authorized Lumber Inspector  
(or Authorized Assistant Lumber Inspector or Officer in Charge)*

Approved: .....  
*Date*

.....  
*Director of Forestry*



In this case no inspection of the lumber is necessary and, therefore, no fees will be collected for the above certificate. It must be emphasized in this connection that in a "drying" certificate for air-dried lumber, these are two essential requirements, viz: (a) At least 90 days' seasoning and (b) lumber must not contain sapwood. As regards the second requirement the question naturally arises as to the verification by the inspector of the second requirement. Under present ordinary methods of handling lumber in lumber yards, there can hardly be any guarantee that a shipment is free from sapwood unless actual inspection of the lumber, piece by piece is made. This simply means that for air-dried lumber actual inspection of the lumber, piece by piece, is necessary. The certificate issued in this case will be treated under another section. Actual inspection for air-dried lumber, may be dispensed with and mere "drying" certificate issued only when the shipment is of such a grade that sapwood is strictly excluded by the lumber company. The inspector, however, must have a personal knowledge of such fact.

(5) *Issuance of live-borers certificate.*—The so-called "live-borer" certificate issued only when actual inspection is made of the shipment. Similar inspection is also necessary in the case of air-dried lumber containing sapwood. Only authorized lumber inspectors and assistant lumber inspectors can sign this certificate.

(6) *Firsts and seconds grades lumber free of sap need no certificate.*—Lumber of the first and seconds grades without sapwood may be shipped to Australia without either a "live-borer" certificate or a "drying" certificate.

(7) *Shipper's invoice must accompany certificate.*—In case where no inspection is necessary and only a "drying" certificate is issued each copy of said certificate for the files in the local station, the district and Central Office, should be accompanied by

the company's invoice of the shipment, which invoice must be secured from the shipper.

(c) *Inspection of lumber for grades.*—In making inspection of lumber for grade, inspectors must be guided by the following instructions:

(1) *Authorized full-pledged lumber inspectors.*—Only authorized full-pledged lumber inspectors are allowed to inspect lumber for grade and sign the necessary inspection certificate. The work must be performed either by the inspector himself or by other forest officers under close supervision by the former; in either case responsibility for the work accomplished lies wholly on the inspector whose signature will appear on the certificate.

(2) *Grading rules other than official.*—In case the lumber is graded in accordance with rules other than the official Bureau of Forestry rules, the party requesting the inspection must furnish the inspector a copy of the grading rules for such grades, the names of which will appear on the certificate issued instead of the official grades.

(3) *Extract of non-official rules to accompany certificate.*—The necessary extract from such grading rules must accompany each copy of the certificate in the above case. A statement to the effect that the shipment was inspected in accordance with such grading rules must be inserted in the certificate.

(4) *Special specification and grades.*—Special specifications or special grades called for by the party requesting inspection must also appear on the certificate. In the absence of any special specifications, all inspection work for grade must be done strictly in accordance with the grading rules of this Bureau.

(5) *Green lumber.*—No inspection shall be allowed for green lumber, as such lumber is liable to suffer considerable degrade after the inspection.

(d) *Request for tally work only.*—This work may be done by any competent for-

est officer, regardless of whether he is an authorized Lumber Inspector or not. The following instructions shall be observed:

(1) *Standard dimensions.*—In the absence of any special instructions, standard dimensions set forth in the grading rules of this Bureau will be the dimensions recorded in the tally sheet.

(2) *Use of B.F. Form No. 4-S.*—The lumber certificate form, B.F. Form No. 4-S, may be used for certifying tallied lumber, making such minor changes as are necessary in the wordings of the form. The necessary number of copies to be prepared for this tally certificate will be the same as that for the certificate of lumber inspection.

(3) *Filing of tally sheets.*—The original tally sheet will be filed in the local station but each tally certificate must be accompanied by a copy of the tally summary.

(e) *Inspection of ties and logs.*—The following instructions shall govern the inspection of ties and logs:

(1) *Inspector must be provided with specifications.*—No official rules have as yet been issued governing the inspection of ties. The party requesting the inspection must therefore invariably furnish the inspector with specifications desired, and such specifications should accompany the certificate.

(2) *Forest officers may inspect.*—Any competent forest officer may inspect ties or logs and issue the necessary certificate therefor provided the work involved is only a matter of identification and measurement and does not include grading.

(3) *What certificate should contain.*—The certificate issued in connection with the above inspection must contain, in the case of ties, species, number of ties and dimensions; and for logs, species, number of logs, net volume in cubic meters with its equivalent in cubic feet in parenthesis. All unaccepted pieces shall be segregated under the heading "Rejects." A statement to the effect that deductions for natural defects

were made, or not made, should also appear on the certificate.

(4) *Scale of individual logs.*—The scale of each individual log, giving length, diameter and net volume, should not accompany each copy of the certificate issued unless such information is desired by the party requesting the inspection.

(5) *Certificate for pinholes on logs not allowed.*—No inspector will be allowed to certify as to the absence or presence of pinholes in logs.

(6) *Inspection fee.*—Inspection fees shall be collected on the basis of the net volume of the ties or logs handled including rejects, if deductions for natural defects were made; otherwise, gross volume will be taken as the basis.

(7) *Shipment for export.*—The general form of certificate of inspection, B.F. Form No. 4-S with the necessary changes shall be used for this work. If the logs or ties are to be shipped abroad, a statement must appear on the certificate to the effect that the forest charges have already been paid. This statement is necessary in order to meet the requirements of the Bureau of Customs with regard to the exportation of forest products.

(f) *Requests for scaling or rescaling logs.*—No request for scaling or rescaling logs for any purpose whatever shall be complied with unless the party requesting the scale agrees that, (a) scaling or rescaling will be done only in case there is an available ranger or scaler to perform the work; (b) the logs to be scaled or rescaled are so located either on dry land, on shallow water, on the beach, or rafted that the scaler can without difficulty determine the species and study the defects of each log; (c) no scaling or rescaling will be permitted of logs which are being hoisted on board ship or barges, nor (d) will scaling or rescaling before 7 o'clock in the morning and after 4 o'clock in the afternoon be allowed. Any deviation from these four conditions will be made only upon the express written order

of the Director. The scaling and rescaling of logs shall be governed by the following instructions:

(1) *General instruction*—

a. If the work involved is identical with the regular scaling work of this Bureau, that is, it does not include grading or any form of selection of logs in accordance with specifications furnished by the interested party, or special method of scaling desired by the party making the request, the rules governing the issuance of proper certificates thereof are given herein below.

b. No scaling fee shall be collected if scaling is done with the object of collecting the corresponding forest charges. But if the work is to be performed in a locality where no scaler is assigned, either permanently or periodically, the interested party shall pay all the necessary expenses from the time the scaler leaves his station until his return. Such expenses will include transportation expenses from station and return and per diems incurred during scaling and in preparing the necessary reports .

c. A certificate showing the net volume by species of the whole shipment may be issued free of charge when the officer issuing the certificate knows positively the exact measurements and species of every log in the shipment. The certificate should contain the number of logs and the corresponding net volume of each species and the number of the invoice, if any, under which the forest charges of the shipment were paid, or the date reported on B.F. Form No. 1-S, if the forest charges are pending payment. The name of the party paying the forest charges should be given. (See sample certificate No. 1).

d. A certificate giving the number of logs shipped but not the species nor volume may be given gratis when the shipment consists of logs scaled previously or already reported on B.F. Form No. 1-S and the officer issuing the certificate cannot definitely identify every log in the shipment. The certificate shall show only the number of logs in the shipment, but it must contain a statement that the logs have been scaled and that the forest charges have been paid already, or reported on B.F. Form No. 1-S for the collection of the corresponding forest charges, if not as yet paid, giving date when the form was submitted. (See sample certificate No. 2.)

e. Forest officers at the point of origin shall on no account rescale logs which they have scaled previously nor officers at the point of destination rescale or check the scale of the shipment, unless agreed upon that the interested party will pay the corresponding charges required in the regulations for scaling, which is at the rate of ₱6.00 per thousand cubic feet or fraction thereof, plus expenses.

f. When rescaling work is done, the result of such work should be embodied in a certificate or statement giving the following information: the number of logs by species, and the gross and net volumes by species. (See sample certificate No. 3.

g. If the interested party requests that the shipment be accompanied by a copy of our scale of the timber involved, showing the diameter and the length of the logs, the request shall be complied with in accordance with the following conditions: (1) If the shipment comes under paragraph (c) or (d) or both,

and if the officer issuing the certificate can give the required information without the necessity of having to rescale the logs, an Auxiliary Invoice (New B.I.R. Form No. 14.04) covering the logs should be filled out attached to the certificate and delivered to the interested party. The invoice should be made in the usual manner, but right under the total gross volume the total amount to be deducted and total net volume should be indicated together with notations as follows:

"This invoice is prepared by the undersigned at the request of Mr. W. R. Gibberson to accompany the shipment and to supplement the certificate to which it is attached.

This invoice is of no value if detached from the certificate.

Zamboanga, Zamboanga, January 1, 1927.

**JUAN DE LA CRUZ**

*Ranger, Bureau of Forestry*"

(2) If the required scale copy cannot be given without remeasuring the logs, the case should be treated as coming under section 211 paragraph (e) hereon, and a charge of P6 per thousand cubic feet, or fractions

(Certificate No. 1)

To Whom It May Concern:

This is to certify that the forest charges of the timber listed below have been paid by ..... under invoice No. ...., assessment No. ...., in the municipality of ..... Province of ..... on ....., or will be paid by the shipper on ....., at the municipality of ..... Province of ..... These logs will be shipped to ..... on the S.S. .... on ..... under bond.

Species	Number of logs	Net volume in cubic meters
Red Lauan .....	200	400
Tañgile .....	150	200
Yacal .....	15	15
<b>Total</b> .....	<b>365</b>	<b>615</b>

Remarks: .....

*Officer in charge*

*Forest Station*

NOTE: Cross out any unnecessary words from the above certificate.

thereof, for scaling should be required. Shipment falling under section 211 paragraphs (e and g-1) should be accompanied by an Auxiliary Invoice (New B.I.R. Form No. 14.04).

h. No charge should be made for an auxiliary invoice prepared as indicated above. Copies of such invoice, however, should be furnished the Director and the Collector of Internal Revenue, through the Central Office. This invoice is to be attached to the certificate accompanying the shipment.

i. No certificate shall be issued to cover a shipment of logs the forest charges of which have not been paid unless such shipment is made by a licensee operating either a class B or C sawmill or under a forestry bond as required by the Bureau of Internal Revenue.

(2) *Sample certificates for scaling and rescaling.*—The following sample certificates are given below to be used accordingly. The certificate shall be made out in six copies, using the regular letter head paper for the original copy, to be disposed of as indicated in section 211, paragraph (a-8).

(Certificate No. 2)

To Whom It May Concern:

This is to certify that ..... of ..... is shipping on the S.S. .... on ..... for ....., 200 logs of undetermined species and volume. These logs have been scaled at various times in the past by the personnel of the Forest Station at ..... and the forest charges had been paid or requests for collection of the same had been made of the proper authorities.

Remarks: .....

.....  
*Officer in charge*

.....  
*Forest Station*

NOTE: Cross out any unnecessary words from the above certificate.

(Certificate No. 3)

To Whom It May Concern:

This is to certify that through the request of ..... the undersigned scaled the timber listed below. Said timber was called at ..... on .....

Number of logs	Species	Gross volume in cu. m.	Netvolume in cu. m.
300	Red Lauan	600	540
50	White Lauan	40	34
100	Apitong	120	110

Remarks: .....

.....  
*Title* .....

SEC. 212. CONCESSION AND SCALING REPORTS.—(a) *Weekly Scale Report* (B.F. Form No. 2a-S and B.F. Form No. 2-S).

(1) *Scale book* —

a. All logs must be recorded as they are scaled on B.F. Form No. 2-S which is furnished in a book of pocket size, with duplicate sheets. Record the data directly on the scale sheets, making a duplicate by putting a sheet of carbon paper between the original and duplicate sheets and fasten them with gem clips to keep from slipping. Use a hard pencil and keep it sharp. A 3-H pencil is best. This makes a dent in the paper and produces a neat indestructible record. Make

no erasures. In case a record must be changed, draw a line through the incorrect entry and write the correct one above. Record principal and common species on separate pages. Species that are cut only in small quantities may be entered in the same scale sheet, seeing to it, however, that those belonging to the same group are recorded together. Only unknown species should be listed under miscellaneous. The columns "Volume Cu. M.," "Merchantable Volume" and "Amount Deducted" shall be totaled. Fill up the column "Kinds of Defect" in accordance with instructions given under Section 197,

"Recording and Describing Defects in Scale Book" in this Manual.

b. In entering data of squared logs in the scale book, the same procedure should be followed as in recording round logs, unless otherwise specified in this paragraph. One scale sheet should be used for one species but no round logs although of the same species should be mixed with squared logs in one sheet. Under the column "Diameter" the average thickness and width of the squared timber should be recorded, thus: 37 x 38. The volume should be computed by multiplying the average thickness by the average width and the product by the length, and the result should be entered under the column "Volume Cu. M." in the scale book. The amount de-

ducted should be computed by multiplying the estimated per cent of the defect by the gross volume of the squared log. Before the scale sheet is filled or the scale in one scale sheet is closed, the columns "Volume Cu. M.," "Amount Deducted" and "Merchantable Volume" should be totaled. On the next line below this total the phrase "30 per cent for loss in squaring" should be inserted and the corresponding amount should be computed by taking 30 per cent of the total gross volume of the squared logs, which is added to the merchantable volume to obtain the total volume of the logs to be assessed. Below is a sample of a scale sheet partially filled to serve as a model in entering data of squared logs in the scale book.

Book No. 1 Sheet No. 4 Licensee INSULAR LUMBER COMPANY.  
Place of Scaling WOODS. Species: IPIL (SQUARED) Date  
DECEMBER 5, 1932.

Log Number	Length in meters	Diameter in centi- meters	Volume in cu. meters	Deductions		Mer. vol- ume	Kinds of defect
				Amount deduct ed	Per cent		
1 .....	5.6	31 x 30	.52	4	.02	.50	H.Ch.—6
2 .....	7.2	40 x 42	1.21	3	.04	1.17	H.Ch.—7
3 .....	6.3	37 x 40	.93	4	.04	.89	(H.Ch.—5 (R.K. 10 x 25 x 1
4 .....	4.2	42 x 42	.74	6	.04	.70	H.Ch.—10
5 .....	5.4	50 x 50	1.35	3	.04	1.31	H.Ch.—9
Totals .....			4.75	...	.18	4.57	
30% for loss in squaring .....						1.43	
Total .....						6.00	

Scaled by RANGER ALFREDO ALFREDO LAGAYA.

Computed by PANTALEON DE LA PEÑA. Checked by PABLO ROQUE.

(2) *Weekly Scale Report* (B.F. Form No. 2a-S) and scale sheet.

a. *Class C sawmills.*—At the end of the week scalers working at Class C sawmills shall total up all the scale sheets filled out during the week, and enter the totals in B.F. Form No. 2a-S. After having been

checked properly, forward the original and duplicate of the form with the scale sheets to the Directors by the first mail after the end of the week, retaining the duplicate of the scale sheets in the scale book and triplicate of Form No. 2a-S for the station files. This report should be

submitted as a matter of information regardless of whether there were logs scaled during the week or not.

b. *Class A and B sawmills.*—Officers scaling at Class A and Class B sawmills, where only a part of the logs are measured by forest officers, should submit their report on B.F. Form No. 2a-S at the end of each period of scaling, heading the statement with "Periodical Scale Report" instead of "Weekly Scale Report." The number of days of operation should be for the period covered by the report. In the preparation of this report, saw-logs should be segregated as usual by species from other logs such as ties, pilings, firewood, etc.

(b) *Monthly Scale Report* (B.F. Form No. 1-5.—(1) *Required of all Class C sawmills.*—Unless otherwise authorized, forest officers should use this form only in reporting logs cut by Class C mills, that is, mills, at which all logs are scaled by forest officers. On the first day of each month weekly scale report totaled by species and groups be added together and entered in proper order on B.F. Form No. 1-S. Scale of abandoned logs, ties, bridge timber, skids, etc., should not be reported on for collection on this form but in an ordinary auxiliary invoice (B.I.R. Form No. 14.04). (See paragraph (c) under section 183.)

(2) *Insertion of "estimated" abandoned timber.*—When the place of regular scaling is in the woods, it is desirable to insert in the report the "estimated" amount of abandoned timber in the cutting areas for the information of all concerned. A convenient way of obtaining this data is for the scaler to simply count the number of logs left in a yarding strip as soon as it is abandoned. To get the corresponding volume in cubic meters, multiply the number of such logs by the volume of the average log. While in any particular case the above volume will

only be approximate inasmuch as every individual log is not actually rescaled, it will nevertheless give sufficiently definite explanation to the lumberman concerned.

(3) *Submission for collection.*—Immediately after the end of the month, or as soon as possible, but not later than the fifth day of the following month, the monthly scale report (B.F. Form No. 1-S) accompanied with a letter of transmittal shall be submitted for collection. The letter of transmittal must state the last day on which the forest charges due thereon may be paid without surcharge and also the date when the local office of the company was furnished with a copy of the report. In Class C sawmills, the last day must be the thirtieth day from the fifteenth of the month following that to which the scale report pertains, taking into account the actual number of days of the month from which the period of 30 days will be begun or 45 days from the beginning of the month. For example the monthly scale report for December, 1931, the last day of payment without 50 per cent penalty is February 14, 1932, for January, 1932 report, the last day is March 16, 1932, etc.

(4) *Distribution of copies of report.*—Eight or more copies of B.F. Form No. 1-S as individual cases may require, shall be prepared with the corresponding copies of the letter of transmittal to be disposed of in the following manner:

Original and duplicate copies to the Manila City treasurer or municipal treasurer, as the case may be, to whom the licensee is authorized to pay the forest charges.

Triplicate copy to the local office of the licensee.

Quadruplicate copy to the Manila office of the licensee; if any, through the Director of Forestry.

Quintuplicate copy to the Collector of Internal Revenue through the Director of Forestry.

Two copies to the Director of Forestry.

One copy to the district forester.

one copy for the station file.

Monthly scale report or invoices shall be submitted by the officer in charge of the station or district forester, as the case may be, to the municipal treasurer, and those for collection in the City Treasurer's Office shall be submitted through the Director.

This report (B.F. Form No. 1-S) shall be submitted every month, regardless of whether there were logs scaled during the month or not. Proper notation should of course be made in the scale report if no logs were scaled during the month.

(c) *Invoices for Class B sawmills submitted by forest officers.*—In Class B sawmills where some of the logs have been scaled by forest officer visiting the sawmills periodically, the scale of such logs should be entered in the log scale record (B.I.R. Form 499), showing the total number of logs by species, with the corresponding gross and net volume and certifying that these logs were scaled by him and the corresponding invoices will be submitted to the treasurer concerned for the collection of forest charges. This is necessary for the information of inspecting forest officers.

(d) *Invoices for Class A sawmills submitted by forest officers.*—In Class A sawmill where some of the logs were scaled by a forest officer, a copy of the auxiliary invoice submitted for the collection of forest charges of the logs scaled should be furnished the sawmill operator who will keep same in his file together with the other invoices submitted by him as permanent records to be shown to inspecting forest officers.

(e) *Monthly concession report*—(periodic concession report).—At the end of each month, officers in charge of scaling stations, or scalers taking charge of scaling work in sawmills, shall submit monthly concession report covering the activities of the mill and logging operations. This report will be prepared for all (A, B, and C) classes of saw-

mill. Where scaling is done wholly or in part by sawmill operators and the mill is visited periodically by a Bureau scaler, the report which shall be called "Periodic Concession Report," should cover the period on which no report was submitted stating the period covered by the report. In this case, such items as are not needed in the outline of a standard report appearing below may be omitted. All scalers and officers in charge of scaling station should endeavor to compile reliable cost of logging, milling, transportation, etc. which shall be included in the monthly concession report. An outline in Appendix VI may be used as a guide in preparing this report.

(f) *Monthly report of lumber shipped and remaining in stock* (B.F. Form No. 6-S).—This form is self-explanatory. It should be submitted at the end of each month with the monthly concession report, and should show the volume in board feet of lumber shipped during the month from the mill yard and the volume remaining in yard at the end of the month. The report must show as accurately as records can be secured from the licensee the amount shipped to the different markets both local and foreign, by species and by money value, if possible. When present, the following species should always be separated in this report: Red Lauan and Tañgile, White Lauan, Apitong, Guijo, Manggachapui, Lumbayao, Yakal, and Palosapis. It is also desirable, when shipments are made regularly in any quantities, to report the following species separately: Ipil, Narra, Molave, Makaasim, Malakadios, and Pagatpat. Separate report for each month will be submitted and the segregation of shipments for several months in one report is not permissible. Miscellaneous species of little importance and shipped in small irregular quantities should be separated by groups.

(g) *Periodic report for Class A and B sawmills.* (B.F. Form No. 7-S)—For all mills at which regular scalers are not permanently stationed, inspecting forest officers



should use (B.F. Form No. 7-S), which may be secured in mimeographed form from the Central Office. This form includes in one sheet all the information of a licensee's activity. Whenever possible, however, the data should be secured and reported on separate forms for each month. The report should show, by principal species specified under B.F. Form No. 6-S and by groups, the volume of logs manifested from the licensee's area; total forest charges; mill tally and the corresponding number of days of the milling operation; lumber sold by destination and construction; lumber use; and inventory of lumber and logs at the mill.

(h) *Logging and milling operation report.*—For each new logging and sawmill operations established in the district or for such old ones as have not as yet been reported upon, a report based on an outline given in Appendix VII shall be submitted as soon as the logging and milling operations have begun. Supplementary reports from time to time are required when material changes had taken place in the operation after the first report has been submitted.

(i) *Report for special manufacturing plants occasionally.*—Special manufacturing plants such as veneer mills, stave mills, dry kilns, etc., should be reported on periodically or whenever data valuable to the Bureau can be acquired. This report should include the type and make of machines, as well as the output, its relation to decreasing or increasing output and its costs, and cost of building, if any.

(j) *Report on lumber yards and lumber dealers.*—In order that this Office may have as complete data as it is possible to obtain regarding the lumber markets in the islands, field men should inspect and submit report every year of each of the lumber yards or lumber dealers doing business within their district. Such report, among other things, should include location, ownership, organization, capital invested, equipments, quantity of lumber handled and sold monthly, lum-

ber inventory, price, sources, marketing facilities, etc. Appendix IX may be used as a guide in preparing this report. This report should be prepared as of November 30 of each year and submitted to the Manila Office not later than the 15th of the following month so as to enable the Director of Forestry to use the data contained therein in the preparation of his annual report.

(k) *Forest fire report.*—All forest fires must be reported to the Director immediately following the outline in Appendix XI.

SEC. 213. SKETCH OF LOGGED-OVER AREAS TO BE SUBMITTED QUARTERLY AND SEMI-ANNUALLY.—A sketch on a convenient scale preferably 1:10,000, located with reference to a known point on the map, showing the area scaled and logged over by an operator or licensee in which permanent scalers are stationed, shall be submitted at the end of each quarter. It should indicate by donkey setting, or cutting area, the number of hectares logged over during the period, the gross and net scale and the per cent of stand by species, as well as the location and work of donkey engines if any. The sketch shall be forwarded through channels to the Director with a letter of transmittal and a tabulation showing the area logged over in hectares in each section or donkey setting with the corresponding net scale and average stand per hectare, as well as a tabulation of stand by volume and per cent of each species. The data shown in this sketch shall be compiled on the progress map of the concession to a scale of 1:20,000 which progress map shall be submitted to the Director at the end of each semester.

ADDITIONAL RULES FOR O. T. No. . . .  
OF . . . . . LOCATED AT  
. . . . .

1. Failure of the licensee to file with the Director of Forestry, Manila, an application for the renewal of this license before its expiration may result in his losing "Priority Privilege" to the area described in the license.

2. When so required by the Director of Forestry, the licensee at his own expense, shall have the boundary lines established and marked on the ground satisfactory to the said Director.

3. No seed or other trees marked by forest officer shall be cut under this license.

4. No entry, occupation or cutting of trees shall be made within thirty (30) meters on each side of national and provincial roads passing through the public domain; *Provided*, that, in areas of aesthetic or scientific value, no entry, occupation or cutting shall be made within a strip of at least sixty (60) meters on each side of such roads.

5. The Director of Forestry reserves the right to permit, if public interests so demand, the opening of such portion or portions of the area as may reasonably be required for logging railroads, cable ways, aerial tramways, roads, trails, log standing, timber chutes or slides, telephone lines, pumping stations and similar rights-of-way for the use of forest licensees, concessionaires, permittees or lessees in carrying on their business.

6. The licensee shall submit to the Director of Forestry, Manila, a monthly re-

port showing by groups, the amount of timber manifested under this license as well as the corresponding forest charges and reforestation charges.

7. The licensee shall pay the following charges for Reforestation Funds, in addition to the regular forest charges provided for under Section 264 of the National Internal Revenue Code (Commonwealth Act No. 446), for each cubic meter of timber cut from the public forest under this license:

(a) On timber of the first and second groups, fifty centavos;

(b) On timber of the third and fourth groups, forty centavos.

For failure to pay said charges within a period of sixty (60) days commencing from the date of demand by the collecting officers, the licensee shall be liable to pay a surcharge of twenty-five per centum (25%) of the amount due. For failure to pay the amount due including surcharge within sixty (60) days after the same has become due and payable, the same shall be considered as sufficient cause for the cancellation of the license and the forfeiture of the corresponding bond deposit of the licensee. (Republic Act No. 115, as amended by Republic Act No. 737).

*Compliments of*

**CAPITOL LUMBER AND  
HARDWARE CO.**

*Lumber and Hardware Dealer  
Bangued, Abra*

**ANDRES LIM**  
*Manager*

**SY LIM**  
*Treasurer*

*Compliments of*

**ANTONIO V. CERVANTES**

*Concessionaire and Dealer  
on*

*Hardwood and Philippine Mahogany*

**Linugos, Misamis Oriental**