

stock (see below *); (3) determine kind of material, and (4) calculate weight; (5) state price. Then mark on form 91 and 104, and 92 and 104 the distinguishing number of the article, number of pieces required, description of same, kind of material, approximate weight and price.

* When conducting enquiry (2) it may be found that a large quantity of the material required is not in stock, and that the same must be ordered outside; in that case, forward without delay requisition to the purchasing department, asking them to secure quotations from dealers straightway.

The part of the estimate dealing with materials having been disposed of, the estimator is face to face with a most important question, viz., what machines are available for doing the work, and what can be accomplished thereon. Every industrial establishment should have a complete inventory of all their machines. The original cost; wear and tear, depreciative value; together with an accurate burden record of each; beside other essential details called for on form 102 and 103. This card is not only of great value in estimating,

the estimated and actual time taken: the estimated time is written in black, the actual is inserted above in red. While as a means for general comparison, it is invaluable, since it enables the estimator of other work not precisely similar, but of like size and form, to determine with some degree of accuracy the time required to do the particular work. Besides, what a manifest advantage it must be to the management, in enabling those in authority to make accurate comparison between the work of different machines and mechanics.

In tabulating time allowance for machining, find out (1) which is the most suitable machine for doing this particular work; (2) is it overcrowded with work, and if so, can it be spared at the time the material will be ready. In any case take good care to engage a machine for the particular operations required, and record date of mutual agreement with the foreman in charge of the machine so requisitioned. Omit not to record in detail the time needed for each operation; due allowance being made for setting and all, from the time the article is conveyed by hand or crane to the

A. J. LAVOIE'S SYSTEM No. 105* PREPARED BY _____ <div style="font-size: 2em; font-weight: bold; letter-spacing: 0.5em;">**ORIGINAL</div> A. J. LAVOIE'S SYSTEM LONGUEUIL P.Q., CANADA COST OF ESTIMATE NO. _____ Number of Sheets _____ Sheet No. _____		PRODUCTION DEPARTMENT No. 4 DATE COMPLETED _____	
OPERATIONS	COST	CHARGES	
LABOR _____			
MATERIAL _____			
SPECIAL (<i>give particulars</i>) _____			

Cost Office _____	BURDEN		
	TOTAL		
REMARKS _____			
Approved by Production Dept. No. 4 Chief Engineer		Approved by Chief Cost Clerk	
Approved by Superintendent when completed		<i>Always state Job, No. on all future correspondence, or it will be re-turned</i> JOB No.	

*Change this number to No. 106 and 107 for the "Duplicate" and "Triplicate."

**Change this name "Original" to "Duplicate" and "Triplicate" for Forms 106 and 107, respectively.

The size of this Form is 6" x 10". Form 105 printed Brown on Pink 20 lbs., and 106 printed Black on Pink 20 lbs., and 107 printed Green on Pink, 20 lbs., bond paper.

but also in annual stock-taking. A similar form has been prepared in this system, for all tools in the establishment. (See tool room part of the "Lavoie system.").

The estimator is thus provided with drawing, number of articles required, description, material, weight, and from careful scrutiny of finish marks on drawings, knows what operations have to be performed on the machines in the shops. The record of operations such as are to be done on this particular work, is to be found on form 11 and 12.

In each department where machine operations like those specified on form 11 and 12 are performed, a wise, experienced mechanic should be appointed to assist the engineer in the preparation of the practical data entered on this operation card. By so doing, the management will not only have an up-to-date estimating engineer, but also an expert intermediate for service in case of dispute where the "Bonus system" is in use.

An exceedingly useful form is 11 and 12; and very necessary for the distributive apportionment of work over the respective departments concerned—shop, machine, and labor. Indeed, it is indispensable for comparison between

machine, discharged from same, passed by the inspector, and delivered to the storage department.

The next part of the estimate is the matter of labor. Here the personal equation comes in, and much depends upon the sagacity of the estimating engineer and his advisers—the expert mechanics in the shops. Not only is the operating time to be carefully figured, but there must be consideration of the man behind the machine: his reputed ability and rate of wages. One mechanic can turn out three times as much work as another, although the difference in wages may be slight; hence the advantage of securing the machine with the triple speed man behind it if possible. But mechanics of this kind are limited in supply, and the source of a one-ply man may be all that can be counted upon, whichever is available, record faithfully.

Having gathered in detail all the various operations, fill in the data on form 91 and 92: forgetting not to include therein the charges for clerical service—duly apportioning same to the respective classes of work. Then add the totals at the place indicated at the bottom of form, then pass on for approval by the chief engineer.