

SYSTEMATIZING FORM WORK.

Reinforced concrete contractors recognize that the cost of form work is one of the dominant factors in determining whether a given job is executed at a profit or a loss. During the last few years a number of construction companies have been investigating methods of form work with an endeavor to devise some system whereby the cost could be reduced. One of the most successful efforts in this direction has been that of the Aberthaw Construction Company, Boston, who, by detailing the forms in the drafting-room of their home office and by a careful routing of the material, have reduced the cost of their form work 20 per cent. in the last three years. Those who have been in contact with this work have called it "scientific management," but a prominent construction engineer calls it "systematizing," and very aptly puts it: "We pay thinking men to think, and carpenters to saw boards."

Perhaps the very best way to illustrate the system is to consider the question of form work at the ten-story Larkin Terminal at Buffalo, N.Y. This building was erected by the Aberthaw Construction Co., while the consulting engineers were Lockwood, Greene & Co., of Boston. The total quantity of form lumber used was nearly 1,000,000 board feet. In order to understand that which follows it should be noted that this structure is 580 ft. long by 100 ft. wide, the floor space being over fourteen acres, and is bounded by Van Rensselaer, Carrol, Exchange and Hydraulic Streets.

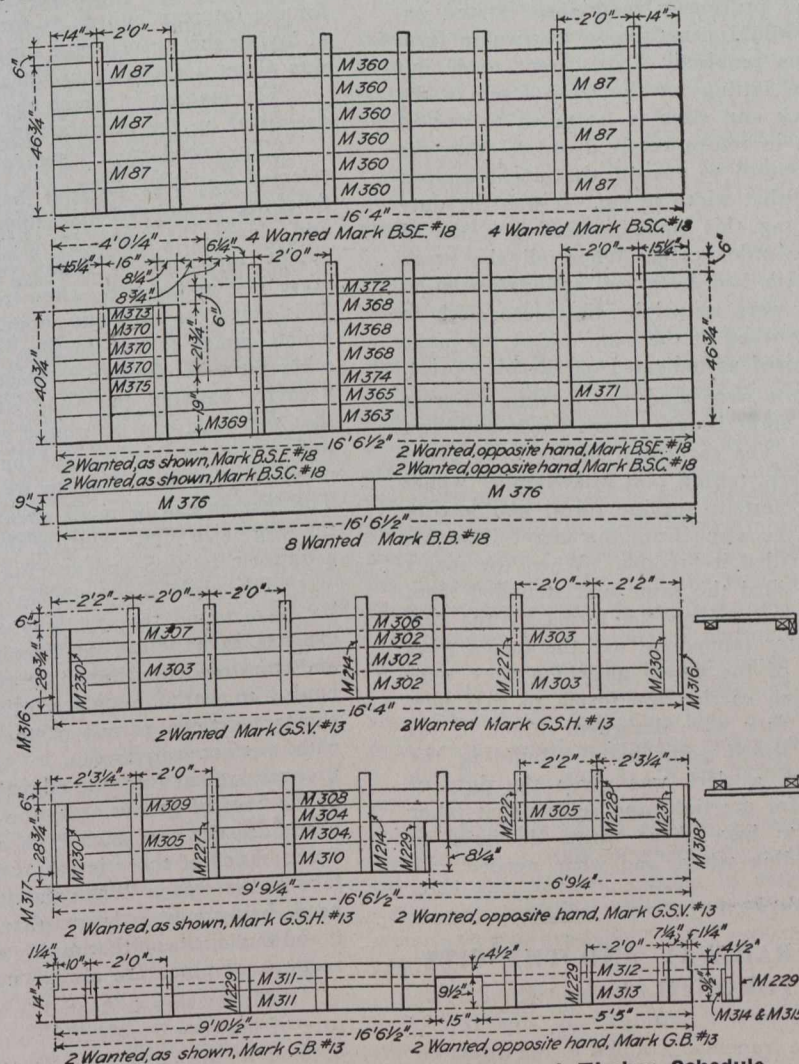
First of all, at the home office a location plan of all beams was made. In this, similar beams were given identical numbers irrespective of location in the building itself. From this location plan form drawings in detail were made, a detail drawing being required for each different sized form, both for sides and bottoms, and the beams of different varieties of column forms were also detailed.

The system of lettering used on this work is of particular note. In order to show the exact location of each form in the building, letters were suffixed to the beam numbers. For instance, a form marked BSE18 would mean that it was for the beam side of beam No. 18 on Exchange Street. The bottom form for this same beam would have the symbol BBE18.

An additional number had to be added to the symbol in the case of the column forms, as there is a variation in the height of the floors. The figures prefixed to the ordinary column symbol designated that the particular form was for the second story columns. To illustrate, a column form with symbol 2CSE19 would mean second story form column side Exchange Street, while 19 is the number of column proper as specified by the original location plan.

Form details were designed complete for two stories, and to each form detail was given a symbol to be stenciled on this form when made up, together with the number or quantity required in the first two stories of the structure. On this same form detail the width of the form was divided into an exact number of boards, which were to make up this total width of the dimensions written on the drawing. Therefore, having given the exact length of form and the width of the different boards going to make up this form and the total number of forms required for the job, it is quite readily seen how the sum total of boards, with the exact dimensions, was easily summed up.

Aside from these form details, it was, of course, necessary to draw plans showing assembling of forms, the chief



Typical Detail Sheet and Timber Schedule.

No.	Pcs.	Size	Length	Mark
48	1 1/4 x 7 3/4	11' 2"	M360	
48	1 1/4 x 7 3/4	5' 2"	M87	
24	1 1/4 x 7 3/4	11' 9 1/2"	M368	
8	1 1/4 x 7 3/4	11' 3 1/4"	M363	
8	1 1/4 x 7 3/4	5' 3 1/4"	M369	
24	1 1/4 x 5 1/2	3' 3 1/2"	M370	
8	1 1/4 x 5 1/2	11' 3 1/4"	M365	
8	1 1/4 x 5 1/2	5' 3 1/4"	M371	
8	1 1/4 x 4 1/2	11' 9 1/2"	M372	
8	1 1/4 x 4 1/2	3' 3 1/2"	M373	
8	1 1/4 x 5 1/2	11' 3 1/4"	M374	
8	1 1/4 x 5 1/2	5' 3 1/4"	M375	
16	1 3/4 x 9"	8' 3 1/4"	M376	
80	2" x 3"	4' 4 3/4"	M239	
16	2" x 3"	3' 4 3/4"	M240	
32	2" x 4"	4' 4 3/4"	M241	

No.	Pcs.	Size	Length	Mark
12	1 1/4 x 7 3/4	12' 2"	M302	
12	1 1/4 x 7 3/4	4' 2"	M303	
8	1 1/4 x 7 3/4	12' 3 1/4"	M304	
8	1 1/4 x 7 3/4	4' 3 1/4"	M305	
4	1 1/4 x 5 1/2	12' 2"	M306	
4	1 1/4 x 5 1/2	4' 2"	M307	
4	1 1/4 x 5"	12' 3 1/4"	M308	
4	1 1/4 x 5"	4' 3 1/4"	M309	
4	1 1/4 x 8 1/2	9' 9 1/4"	M310	
8	1 3/4 x 7"	9' 10 1/2"	M311	
4	1 3/4 x 7"	6' 8"	M312	
4	1 3/4 x 7"	5' 5"	M313	
4	2 1/8 x 9 1/2	9' 10 1/2"	M314	
4	2 1/8 x 9 1/2	5' 5"	M315	
8	1 1/4 x 4 1/4	2' 4 3/4"	M316	
4	1 1/4 x 3 3/4	2' 4 3/4"	M317	
4	1 1/4 x 3 3/4	1' 8 1/2"	M318	
32	2" x 3"	2' 10 1/4"	M214	
8	2" x 3"	2' 2 1/2"	M228	
36	2" x 3"	1' 2"	M229	
12	3" x 4"	2' 4 3/4"	M230	
4	3" x 4"	1' 8 1/2"	M231	
12	2" x 4"	2' 10 3/4"	M227	
4	2" x 4"	2' 2 1/2"	M222	

object of this being to specify the spacing of posts and jacks, amount of bracing, and location. From this assembly plan, together with a layout plan of the building, the exact number of pieces and size of lumber constituting the centering could be scheduled. On this completed schedule bids were obtained from the various lumber dealers before ordering the material for the job.

It was very vital that a systematic plan of piling and laying out the lumber should be adopted, inasmuch as 1,000,000 board feet were used. Particular attention was given the dressed stock going to make up the forms proper, since this was taken to and from the mill to the benches. The lumber was so piled that when the laborer wanted a certain number of boards of a particular size he could find them quickly, for a plan was drawn showing the lumber layout and the relative location of different piles of lumber according to widths and lengths. Signs were placed in front