

THE AMERICAN SUPERINTENDENT.*

THE art of superintending is not only the art of fault finding, but the art of fault remedying and fault preventing. If building operations were not attended by mistakes, misinterpretations and disagreements, it is evident there would be no need for the genus superintendent; hence it is with the difficulties that beset him, and their remedies, that this article will chiefly concern itself.

The faulty plan is the first source of annoyance. Frequently a set of drawings is so hastily finished that omissions and inaccuracies are almost unavoidable. Contradictions and discrepancies occur between the general drawing, scale and full-size details, and the specifications, resulting not only in annoyance and controversy, but also in no little expense and delay if not discovered before the ordering of material, or the performance of that part of the work affected by them. It should be the superintendent's first care to make a thorough examination of all plans and details, comparing them with the specifications and with each other, in order that all errors may be discovered and eliminated before the work is begun. This examination will also aid in fixing in the mind the peculiarities which differentiate the new work from others with which he has previously been connected.

The plans furnished the contractors should be complete. The drawings should be provided in sufficient number to thoroughly cover the work, and show plainly how it is to be done, so nothing will be left to the imagination of the builder. There should be numerous sectional drawings, which shall clearly show any unusual or special features or finish, and a sufficiency of dimensions to permit the execution of the work with the fewest possible arithmetical calculations by the workmen at the building.

Draftsmen are usually reluctant to bind themselves by figures on a drawing, but unless the workmen are mind readers—and few of them are—it is hardly to be expected they will properly carry out the artist's idea when he himself declines to define it. In figuring dimensions, it is of advantage to give, where possible, a string of distances between centres of main features, with subordinate lines of dimension for the separate parts of those features, and also to note on each plan the bays or dormers which are to centre with some other feature of the building above or below them. This method will materially decrease the liability of the builder to make mistakes in laying out his work, and an error, when made, may be quickly found and easily rectified without affecting more than a single feature. It will also be found useful to adopt a "building" line (usually the line of the first storey above the water table) as a base line from which to figure dimensions, as well on the basement and foundation-plans as on the first floor plan. This building line may be shown by a red or black dotted line on the drawings.

The value of explanatory notes on drawings should not be underestimated, and the more of them there are even though they are repetitions of items covered by the specifications, the better. The plans may be called common property, since they are used by all the craftsmen alike, while the specifications, if accessible, are usually so divided that each foreman refers only to the particular section covering his special work, and is ignorant of its relation to that of other trades. In such cases it is evident that proper co-operation is improbable, if not impossible.

The repetition of the common lines of height on all elevations and vertical sections is to be recommended. It is quite a convenience to the superintendent, and saves mistakes arising from the builder's inclination to trust to memory rather than to turn to the plan on which the heights occur. It may be said that the contractor should be made to suffer for his own negligence, but it must be remembered that the drawings are really implements or tools as necessary for the prosecution of the work as the trowel, saw or hammer, and it is the duty of the architect to furnish them to the builder in as perfect a state as possible, if the final results are to be satisfactory.

Any improvements tending to convenience in handling will amply repay any extra time consumed in preparing them in the draughting-room, and a day or two, or in unusual cases even a week, devoted to figuring and checking up dimensions on the working plans will avoid expensive mistakes, and time-wasting delays, with the resulting disputes and controversies, and at the same time will give the plans a definiteness that will enable the estimator to make a closer proposal for the work before the contract is awarded. For the same reason it is desirable to fully indicate by framing plans or diagrams the kind and size of materials to be used and the methods to be employed.

It is a decided advantage to the superintendent if he has been employed in the production of the plans whose execution he is to supervise. His familiarity with the drawings will enable him to see more readily the effect that a change at one point will have on others of the work, and will be especially valuable to him when it is necessary to give an order without a chance for study or leisurely consideration.

The superintendent should secure a complete set of all drawings to be used in the work, including general plan, scale and full-size details and diagrams outside of the sets furnished the contractors. He should also have his own copy of the specifications, and all agreements and contracts to which to refer in case of dispute between contractors concerning the scope of their respective contracts. The above applies only to the superintendent in charge of large work not in the same city with the architect, who cannot therefore have access to the office sets.

The first duty of the superintendent on the ground is to check up the dimensions and laying out of the building. For this a steel tape should preferably be used, and for a long series of measurements the ring end held at a single point while the different required dimensions are marked off in order along the length of the

tape from a memorandum slip previously prepared. This prevents accumulative errors, which with the average mason reaches 4 or 5 inches in 100 feet before it is considered worth noticing. In order to keep the work in hand the superintendent should require that he shall have approved all work laid out before building is proceeded with. To measure the width of footing trenches a stick cut to the width of the footing, with a notch for the building line, will be found convenient. A plumb line dropped from the building line stretched above will pass the notch, and show at once if the trench is properly located and of the required size. With several different widths of footings, and for places where no line can be stretched in the excavation itself, this method should save much time and many mistakes.

If the plans show no chases or slots for soil and waste pipes, or gas, water and electric mains, the superintendent should arrange with the mason to build them in the proper places as the walls go up. Neglect to consider this frequently leads to unsightly results, such as a group of pipes cutting through a handsome cornice, or spoiling the appearance of an otherwise attractive room. The location of the horizontal pipes should also be considered, whether in the floor, that is, between the joists or cut in over them; under the floor, hung to the ceiling below and exposed to sight; or under a raised floor; also, whether the marble or other wainscoting back of toilet-room fixtures can set flat against the wall or must be moved far enough forward to allow the waste, supply and vent pipes to run behind it.

The note book should be the superintendent's constant companion, not only for jotting down ordinary items to jog the memory for the daily details of the work, but to be used as well to preserve a record of orders to and agreements with contractors, instruction to foremen and alterations or changes sanctioned in plans or specifications. In fact, the entries should include everything relating to the building which may possibly be needed for future reference. Especially should dates of orders, and delivery of plans and details (if no record is kept in the office) be noted down, in case it becomes necessary to refer to them in settlement of claims for enforced delay in completing a time contract.

The superintendent should notice from time to time if all the workmen who can be advantageously employed are on the different branches of the work. He should enquire concerning the ordering of material and the progress of the work of the sub-contractors, in order that no delay be caused by their failure to come to time. More time is thus lost than from all other causes together.

The superintendent should see that application is made for detail drawings in such season that they will be on hand before needed for use.

It is a good plan to occasionally visit the mills, foundry, pattern and modelling shops, to inspect the work in progress, and explain to the workmen points that are vague or misunderstood before it is too late.

One should not be above accepting advice from contractor or workmen for fear of loss of prestige, since frequently their experience suggests methods or facts, either of merit in themselves or expedient under existing circumstances. Neither should one be so complaisant as to adopt these suggestions without careful consideration. If they are rejected it should be done so as to leave no doubt about it in the mind of the workman, nor as to method actually to be employed. Frequently it is necessary to say to the builder, "Your way may be as good, but the specifications prescribe a method which I know will give results satisfactory to the architect, and as I am answerable to him after your responsibility in connection with the work ceases, I must require you to follow the specified directions." Material or work condemned should be ordered removed at once. It is a common trick among foremen to agree to see to that later, with the expectation that the matter will slip the superintendent's mind until the defective material or work can be hidden or covered up.

Structural iron is usually required to have several coats of paint after delivery. In order to insure its receiving the required number of coats and proper care in their application, and also to prevent a delay for painting and drying when the material is wanted for use, it is well to insist that this work be done as soon as the metal is on the ground.

The superintendent himself should cultivate the following characteristics: Tact, force, decision and gentlemanliness. He will be called upon to listen to endless complaints of interference by one contractor's men with the work of the others, and is expected to arbitrate them. He will be referred to as a walking specification by foremen who find it more convenient to question him than to take the trouble to look up requirements themselves. This he should be encouraged to do. Some foremen ignore the specifications entirely, depending on the superintendent to assume responsibility for anything opposed to them which he has failed to discover, but "which it is his duty to find out," as Mr. Clarke was once informed by a foreman. The same brilliant fellow was one day very much put out with him, because his attention had not been called to a note in one of the plans. He had shored up a 17-inch brick wall, and cut an opening in it in the first storey, before he discovered that it should have been torn out above also, to make way for a stud partition to take its place. Of course, the single I-beam which the note called for, while ample to support a stud partition, would hardly do the same service for a 17-inch brick wall. Another nuisance is the man who always knows a better way to do everything than the way he is called on to do it (simply for the sake of change), and who is positively unhappy if his suggestions are unheeded. Of course, the superintendent ought never to lose his temper. He may lose his patience and express his opinions, but he should let the other fellow put himself at a disadvantage by getting mad. As a general rule, however, flattery builds quicker than friction, and the greater the superintendent's skill in overcoming difficulties, expediting work and settling differences, the better superintendent he is.

* From an article by Mr. Edwin B. Clarke published in the *Technograph*, the annual published at the University of Illinois.