

# MUNICIPAL DEPARTMENT

## SPECIFICATIONS.\*

By JAMES HUTCHISON.

Let the language of your specification be clear, concise and easily understood, and so definite that those tendering will know exactly what will be required of them. Make the arrangement such that the essential requirements will stand out prominently and not be buried among the general conditions or clauses of less importance.

The opening clauses should give a general description of the nature and extent of the work as a whole, and where plans accompany the specifications reference should be made to them. The succeeding clauses should define or describe the work in detail, following as nearly as practicable the order in which it will be taken up in construction.

The length of this description will be governed by the complexity of the work and the nature of the plans. In preparing drawings make them as complete as possible; the specifications will then deal chiefly with the quality of the materials, the nature of the workmanship and the final results to be attained. Following this we should have the general conditions, referring, among other things, to the time and manner of payment, the payment for extra work, and what shall constitute an extra, the appliances to be used, the protection of life and property, etc.

As already stated, the chief aim should be to give a clear knowledge of what will be demanded of the contractor. If the work consists of excavation, state the extent of it, tell how it will be classified and measured, how and where it is to be disposed of. If test pits have been sunk or borings made, give the results of those trials, but in general do not guarantee the accuracy of them. Require the contractor to do all the pumping and shoring, if such are needed.

If you are building masonry, describe the quality of the stone, give the thickness of the courses, the dimensions of the stones, the manner in which they are to be dressed, the proportion of headers and the nature of the backing, i.e., whether it is to be of stones the same thickness as the face stones, or of stones of various thicknesses, or of rubble. If heavy stones are to be used, require them to be handled with a derrick, otherwise you may meet a contractor who will attempt to roll them into place. It is not enough to say that the pointing shall be neatly done, for the contractor's idea of neatness may differ from yours.

It is a hard matter to get ordinary mechanics to change their usual style of work, hence in places where appearance is a secondary consideration, don't attempt

it, but instead, adapt your specifications to the situation, as nothing but vexation will result from trying to get masons accustomed to building rubble only to work to 3/8-inch joints, better in such cases use a higher grade of cement or a richer mortar with good flat-bedded stones well bonded, and dispense with fine dressing. For mortar give the proportions of cement and sand, how they are to be measured and the quality of each. The usual proportions are 1 of cement to 2 of sand, or 1 of cement to 3 of sand. The measuring can be easily done in bottomless boxes on the mixing board; a 350-pound barrel of cement measured loose contains about 4 cubic feet. In small works where the cement will not be tested, name the brand or brands that may be used. If a quantity will be required, specify the quality by naming the strength it must give in a seven-day test, the specific gravity, the fineness of grinding and soundness in the hot test. If water gives trouble use a quick-setting cement, otherwise a moderately slow one.

In excavating or trenching in streets, let the surface metal be kept separate to be used in finishing, have the street left in the same condition that it was before beginning the work, and let the contractor maintain the part trenched in such condition for three or six months.

If you have painting to do state the kind and number of colors to be used, as that affects the labor required. If lead is to form the body of the paint, decide on which brands you will accept, and require it to be brought on the work in the original unbroken package. Ask for pure linseed oil, and forbid the use of benzine and such adulterants. If the honesty of your contractor is not above suspicion, employ an inspector who understands the business. In undertakings where unforeseen conditions are apt to arise, reserve the right to make such changes in the plans as may be deemed advisable.

Changes will affect the amount of labor and material required, therefore provide for the extra payment to be made in case of increase, and for the reduction if the work is lessened.

Make the decision of the engineer final as to the interpretation of the specifications and whether the work is in compliance with them. Remembering that the engineer is only human, do not leave questions to be settled by his opinion where such can be previously provided for.

These suggestions might be extended, but if enough has been said to indicate the line along which the work of preparing specifications should proceed, the object of this paper will have been attained, and for further guidance in the work I would refer you to Johnson's "Engineering Contracts and Specifications."

## PROVINCIAL AID IN ROAD BUILDING.

The Department of Agriculture of the province of Quebec has issued the following circular to municipal authorities:

Sir,—In 1897 the Department of Agriculture inaugurated a new policy for encouraging improvements to roads by granting aid to rural municipalities to enable them to purchase special machines for repairing roads.

Notwithstanding the bad weather that prevailed during last summer and last autumn and that was unfavorable for effecting repairs to roads, the results obtained have been most satisfactory.

Seventy-seven municipalities have had their names entered so as to benefit by the advantage offered them, and according to the official reports received up to date at the Department of Agriculture over 150 miles of road have been repaired since last June.

These results justify the department in carrying out the system inaugurated last summer, with the few following modifications:—

A special grant of \$300 was placed last summer at the disposal of each county, to be divided into premiums of \$125, \$100 and \$75 between the first three municipalities that availed themselves of the same. The same grant will be given this year to the counties which shall have claimed it in whole or part between this and the month of July next.

In counties where the total amount of \$300 shall have been distributed between now and July, the department will again grant from and after that date three premiums of \$75 each to the first three municipalities applying for the same. If a single municipality in a county has then availed itself of the offer made to each county, the department will place at the disposal of the same county a bonus of \$100 and two of \$75.

Moreover, in order to encourage the stoning of roads, the department has decided to grant each county municipality, aid towards the purchase of stone-breakers, with engine, roller and sorter, provided that the total cost of such machines do not exceed \$2,400 per county. An amendment to the Municipal Code passed during the last session of the Legislature, authorizes county councils to make arrangements with each parish, village, or town municipality of the same electoral division, for repairing the roads in those various municipalities. The general act respecting town corporations has likewise been amended in the same sense.

Municipal councils of parishes or of counties desiring to avail themselves of the above advantages must draw up their application in the form of a resolution, a copy whereof must be sent to the Department of Agriculture. The premium to which they shall be entitled shall be paid to them after at least two miles of earth road shall have been repaired and after a certificate to that effect shall have been forwarded to the department with a copy of the invoice from the company that sold them the machine.

In the case of the purchase of a stone-breaker, half a mile of macadamized road must have been completed and accepted by an officer of the Department of Agriculture, before the Government contributions shall be paid.

Machines for repairing earth roads that are bought by the municipalities with the help of the Government shall remain the property of such municipalities for at least three years, and the county councils that purchase stone-breakers cannot sell such machines before they have been at least five years in use in the same county.

The resignation of Mr. J. F. Armour, town engineer of Dundas, Ont., is announced.

Mr. Richard Windatt, town clerk of Bowmanville, Ont., died on March 27th, after an extended illness. He was for 40 years clerk of the town as well as clerk of the municipality of Dairlington, and was for 37 years secretary of the West Durham Agricultural Society.

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\* Abstract of a paper presented before the Association of Ontario Land Surveyors, March, 1898.