

A G E N D A

For Public Works Committee meeting to be held 4.00 p.m., Wednesday,
November 14th, 1962 in Council Chambers, City Hall, Red Deer, Alta.

1. Confirmation of Minutes of October 3rd, 1962.
 2. City Engineer's Report - General Construction - City Forces v Contractors.
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November 8th, 1962.

The Chairman
and Members of
Public Works Committee,
Red Deer.

The City Council has asked that the Public Works Committee study whether the City Staff could undertake more engineering and more construction of City projects. The Committee has agreed that the subjects be studied separately i.e.

- (a) Construction - by City forces or by contractors
- (b) Design and/or supervision - by City forces or consultants.

This report will concern itself with item (a) Construction. A second report on item (b) Design and/or Supervision will be submitted in about one month.

In order to make a conclusive study of the merits of using City Forces or Contractors to construct City facilities it is necessary at the outset to establish what goal we intend to achieve. I submit that there is but one primary goal. We are trying to get the best dollar value for money spent. Most other considerations (mentioned further in this report) can be expressed in terms of dollars. Therefore we must establish a comparison of costs.

COST

The major items of cost of any construction project are as follows:

- 1. Materials
- 2. Labour
- 3. Equipment Charges
- 4. Overhead
- 5. Profit

MATERIALS

- 1. The cost of materials is generally a major item of cost of any project. The original cost to the City and the contractor is generally the same. However, the contractor gains the advantage in other respects:
 - (a) The contractor will likely finance the cost of materials over a period of time while the municipality pays cash. The contractor gains the advantage on the use and cost of money. (See City Auditors comments on machine rental).
 - (b) The contractor minimizes his "down time" on machines and labour by having the materials readily available. This is possible because he does not have any quantity of "red tape" to deal with. The City must take many precautions and safeguards because public money is being spent. This includes purchasing agents, vast storage buildings and yards, rigid stock control, tender calls on small items, etc. The contractor quite often makes a deal over a cup of coffee for his materials then piles the material on a vacant lot. By having this flexibility in handling materials he saves on "downtime" of labour and machinery. For simplicity's sake we will apply this saving to the cost of materials.

Net Effect: I would suggest that the contractor has an advantage in the order of 10%.

LABOUR

2. The cost of labour is another major factor in the cost of construction. I submit that the contractor has the advantage for the following reasons:

- (a) Contractors can work their men longer hours each day, and days per week before paying time and a half or double time. This is particularly applicable to contractors not strongly unionized.
- (b) Contractors provide fewer fringe benefits.
- (c) Contractors lay off staff on short notice. They are not so bound by unions, "red tape" or politics. For example, if a labourer reports to work in this City and is immediately sent home due to inclement weather he receives two hours pay. If he works two hours and is then sent home he receives four hours pay. This increases the unit labour cost.
- (d) The contractors supervising staff work their crews harder because they receive profit or incentive bonuses. Some contractors pay their Superintendent, Foremen and machine operators an annual bonus depending on the company's earnings. This accounts for an increase in efficiency which also nets a saving on equipment usage.

NLT EFFECT:

(a) Overtime. Our Union requires that overtime is paid after 40 hours or after eight hours on a given day. Double time is paid on Saturdays, Sundays and Statutory Holidays. Most utility and road contractors can work 48 hours without paying overtime, and they do not pay double time on Saturdays. For the sake of example let us assume that the contractor works six days a week and ten hours per day and he pays his men \$1.70 per hour. Then let us compare the cost if our men worked for the same period and for the same rate.

<u>City</u>	<u>Contractor</u>
Regular time $5 \times 8 \times 1.70 = 68.00$	$48 \times 1.70 = 81.60$
Time and half $5 \times 2 \times 2.55 = 25.50$	$12 \times 2.55 = 30.60$
Double Time $10 \times 3.40 = 34.00$	
<u>. 127.50</u>	<u>112.20</u>

Contractor's advantage $\frac{127.50 - 112.20}{116.20} = 15.3\% - \text{say } 15\%$

To be conservative say 10%

(b) Fringe Benefits. Both the City and contractor are required to pay mandatory fringe benefits such as unemployment insurance, compensation, holiday pay, etc. However, I doubt whether the contractors give much more than the mandatory benefits. Other benefits are M.S.I., statutory holidays, pension, sickness pay, coffee breaks, extra vacation time over the mandatory. These extra benefits cost the City about 12%. On the average the contractors might provide half of these. The contractor then has the advantage. Say 5%.

(c) Lay Off. On this item I would think the contractor would have the advantage in the order of 2%.

(d) Supervisory Staff. I believe the contractor has a substantial advantage on this item because he not only gains on labour but on the best use of equipment and materials. Say 8%.

Total advantage to contractor = 10 plus 5 plus 2 plus 8 = 25%

EQUIPMENT CHARGES

3. The cost of equipment charges is another major factor in the total cost of the project. I asked Mr. Sheridan, our City Auditor, if the contractor had any advantage because of rapid tax write-offs for income tax purposes. Following is his letter which has many good points. However, apparently it is difficult to answer the original question I asked.

City of Red Deer.
Attention Mr. N.J. Deck.

Your enquiry as to whether private contractors have an advantage over a municipality owing to depreciation charges for tax purposes, is a rather difficult question to answer.

The municipality has an advantage as it has no income tax to pay, however, to offset this, the contractor may finance the cost of his equipment over a period of time while the municipality pays cash. We here see an advantage to the contractor in regard to the use and cost of money.

As the municipality pays cash it has lost the earning power of those dollars on the money market and the contractor can earn the same profits from rentals with less equity and therefore less loss of earning on the dollars.

As this point, the advantage to the municipality of having no tax liability could conceivably be offset by the use of money advantage which the contractor has.

It is our opinion that the contractor has an advantage over the municipality for the following reasons.

1. The profit motive and competition with which he is faced forces him to be more efficient in order to survive. (This is not to suggest that a municipality is inefficient).
2. His equipment could be less costly generally as a decision to trade an older unit is his alone and does not have to be justified to the taxpayers.
3. The overall use of equipment will be dictated by the profit motive, whereas a municipality may be required to make use of their equipment at times which could conceivably shorten its life.
4. Overhead costs must be included to arrive at a fair rental. It is conceivable that these costs to a contractor would be less than to a municipality.

We will be pleased to discuss this problem with you further at your convenience.

D.J. Sheridan,
 Mackenzie, Sheridan, Matthew & Co.

Several other points I would like to add are as follows:

- (a) The contractor has the advantage because he can match his equipment with the project. In other words he bids a job which he can do with the equipment he has on hand.
- (b) Contractors will take a job as a joint venture and pool their equipment. Whereas if the job is too big for the City we would have to rent equipment. Usually the rates for rented equipment are higher than for owned equipment. Also it is difficult to rent equipment during peak periods.

- (c) The City is not required to pay equipment fuel taxes and would therefore have the advantage in this respect.

Net Effect:

I believe the contractor would have at least a 5% advantage.

OVERHEAD

4. This is a relatively minor factor in the total cost of a project. The contractor has the advantage for the following reasons:
- (a) His office rental is usually lower
 - (b) His administrative staff is smaller
 - (c) He would have less red tape because he is using private money and does not need the accepted government safeguards. Therefore his legal, accounting and auditing charges would be lower.

The City would have the advantage for the following reasons:

- (a) City does not have to provide bonds or licenses.
- (b) City does not pay taxes.

Net Effect:

This is a very difficult factor to evaluate, because it depends to great extent on the size of the operation of a contractor. However, I think it would be safe to assume the contractor has an advantage of 5%.

PROFIT

5. This is a relatively minor factor in the total cost of the project. However, it is the major factor in favour of City forces doing work. Because City does not have to show a profit on work it undertakes.

How much profit does a contractor expect?

This is dependent on a number of factors which are outlined below.

- (a) If there is a great deal of work available for contractor he will plan on a higher profit.
- (b) If the possible risk on a given project is high the contractor makes an allowance for unknowns. If the risk doesn't develop his profit increases. The risk can be reduced if:
 - (i) The contractor has a knowledge of conditions such as soils, availability of gravel etc.
 - (ii) The contractor knows the Engineers and understands the contract plans and specifications so that he is familiar with the standards that must be achieved.
 - (iii) The Contractor knows the City Officials and knows what to expect in the way of interference, understanding, co-operation, etc.

I believe that a contractor will take the maximum amount of profit he can get. If bidding is very competitive he will take a small profit. If bidding is not competitive he will take a big profit. Occasionally a contractor inadvertently takes a loss. As an average let us assume he expects a net profit of 10%. I think this would be considered a fair profit considering the contractor's investment.

Net Effect:

City has advantage of 100%.

SUMMARY OF COST CONSIDERATION

1. Materials - Contractor has a 10% advantage
2. Labour - Contractor has a 25% advantage
3. Equipment Rentals - Contractor has a 5% advantage
4. Overhead - Contractor has a 5% advantage
5. Profit - City has a 100% advantage

To determine the economic advantage of doing work by contract or by City forces it would be desirable now to consider at least two types of projects. This is necessary because there may be considerable variation in the units of material, labour and equipment charges that may go into various projects. We have selected a road and sidewalk contract as one project and a utility contract as a second project. From our records of previous contracts we have tried to determine what the actual units might be in these projects. If we assume that the materials, labour, equipment charges and overhead cost \$1,000,000 on each project we can then make a comparison.

AVERAGE UTILITY CONTRACT

<u>Item</u>	<u>Amount</u>	<u>Contractor</u>		<u>City Forces</u>
Material	61%	\$610,000	add 10%	\$671,000
Labour	15%	150,000	add 25%	187,500
Equipment	17%	170,000	add 5%	178,500
Overhead	7%	70,000	add 5%	73,500
		1,000,000		1,110,500
Add profit	10%	100,000		nil
Total Cost		1,100,000		1,110,500
				1,100,000
Difference				\$ 10,500

\$10,500

Advantage by using a contractor = $\frac{10,500}{1,100,000} = 1\%$

AVERAGE ROAD CONTRACT

<u>Item</u>	<u>Amount</u>	<u>Contractor</u>		<u>City Forces</u>
Material	24%	\$240,000	add 10%	\$264,000
Labour	30%	300,000	add 25%	375,000
Equipment	39%	390,000	add 5%	409,500
Overhead	7%	70,000	add 5%	73,500
		1,000,000		1,122,000
Add Profit	10%	100,000		nil
		1,100,000		1,122,000
				1,100,000
Difference				\$ 22,000

22,000

Advantage by using a contractor $\frac{22,000}{1,100,000} = 2\%$

OTHER CONSIDERATIONS

- A. Capital Costs of Equipment. The equipment presently owned by this City is only sufficient to handle normal operation and maintenance work plus a small amount of construction. If we intend to undertake more construction we would have to invest heavily in additional equipment. For example we let one contract for \$303,000 this Summer. The contractor had equipment valued at approximately \$400,000 on this job for part of the time. Our total contracts this year were in the order of \$1,100,000 (excluding buildings). Next year our programme will be in the order of \$1,500,000.
- B. Flexibility. By contracting work we leave ourselves very flexible. To the best of my knowledge we have never postponed a necessary project for the reason

that we did not have sufficient machines and forces. If our programmes are to remain flexible it is difficult to do the work ourselves because we would have problems with the balance of equipment and men from year to year. For example you will note from the seven year plan that we intend to spend the following sums on debenture roads in the year noted:

1963 - \$285,000
 1964 - 264,200
 1965 - 334,200
 1966 - 34,000

Note the imbalance in 1966.

For storm sewers the same applies viz:

1963 - \$41,700
 1964 - 89,000
 1965 - 365,000
 1966 - nil

Flexibility is particularly important in Red Deer because we completely develop all of our residential and industrial subdivisions.

- C. Maintenance. Proper maintenance of City facilities such as roads, lanes, sewers, water mains, etc., is a very important consideration. Therefore it is very important that this work be properly planned, scheduled and executed. I believe that any municipal organization that is charged with the responsibility of both construction and maintenance will have a tendency to relegate maintenance to a minor role. The net effect is a mediocre maintenance programme.

The reason for understressing maintenance is obvious. Everyone including elected officials, taxpayers and staff are interested in construction because it is dynamic. Maintenance is routine and quite often not even apparent i.e. on sewers. As a result the construction phase gets the most consideration, i.e. the best planning, the first money, the best staff, the best equipment. Large cities can partially overcome this problem by creating completely separate construction and maintenance divisions which have their own supervisory staff, equipment and crews. In a small city this is almost impossible to obtain. As a result if there is some choice in doing a project which is construction and one which is maintenance, invariably the construction project is done first and the maintenance project is left until men and equipment are available.

Under our present system whereby we contract over 90% of our work our supervisory staff, equipment and crews deal almost exclusively with maintenance and the net effect is excellent.

- D. Public Relations. The method the City uses to do its work will no doubt effect its public relations. Elected City Officials will be able to assess the results better than appointed staff. However, I would like to make some comment on this subject because I believe the evaluation of staff is based to a great degree on the status of its public relations, (perhaps out of proportion to its true economic worth).
- (a) I believe that the public considers that contracting is the right approach. As proof of this I can say that as we increased the volume of work done by contractors we received fewer complaints about "goldbricking", and suggestions on how to do or how not to do things.
 - (b) I believe that contributing or approving agencies believe that contracting is the right approach. For example the Federal and Provincial Governments, Board of Transport Commissioners, the Railroad Companies, C.M.H.C., and others, are easily satisfied when shown contract figures. But when City forces do the work they check our accounts in great detail before approval or contributions are received.

E. Quality. The quality of work done by City crews should be better because there should not be a tendency to cut corners. On the other hand if a City crew does some work which is not quite up to standard, they may be inclined to accept it. The Contractor would normally be expected to replace work that did not meet the required standard. It is my opinion that if City crews do a majority of construction the general accepted standard of work will eventually drop for the reason mentioned above. If contractors do the majority of work the standard will be maintained or increased.

It is of interest to note that when the City of Red Deer started to contract most of its sidewalks the standard for concrete rose appreciably not only on City projects but for all the concrete being placed in the City.

I should mention that we are developing quantity and quality control tests that make it difficult for a contractor to cut corners. For example, on sidewalks and pavement we take diamond cores at random when the work is done and we can measure thicknesses and check quality. Penalties for low standards discourage cutting corners.

POLICY IN OTHER CITIES

Six Western cities were contacted to determine the engineering policies in these centres. Following are quotations of particular interest from these replies.

Dawson Creek: "The City has undertaken some construction projects with City Forces, especially Winter Works Projects, but indications are that work was not done for less than contract prices in most cases. It is estimated that at least 90% of the capital works are contracted".

Calgary: "It should be kept in mind that once a City is committed to doing all or a portion of their Capital Programme it is difficult, because of the investment and personnel involved, to "get out of the game". With the increasing competition for Municipal work which has been a marked feature of recent years, I would be inclined to think long and hard before recommending large capital investments designed to establish the City in these field".

Medicine Hat: "We take unusual and difficult work ourselves because we don't want to pay for the contractor's price if the risk he anticipates and does not often occur."

"Because of the public demand that the contractors can do work for less than the City, we make a point to call for tenders on various jobs and we bid on it too. We keep costs and on ordinary work of the sewer, water, road construction type, we are very certain that we can do this cheaper than any contractor can."

Edmonton: "Prior to about 1950, we contracted practically all sewer and water construction. At that time, we felt prices were getting out of line due to the tremendous amount of work offering to the available contractors. Since that time, day labour forces have done most of the open cut and tunnel sewer works (possibly 80% to 90%) and about the same in water main construction. As a result, we have built up efficient construction crews and kept accurate costs and we find the cost much reduced from the tender prices until the last year or so when the bids we have called are close to our costs for open cut work. With much less volume of sewer construction in the Province, we are forcing the contractors to compete with our prices."

"The City Council have set the policy that if a contract bid is not more than 7% greater than the City bid, they will consider the contractor's bid; this differential to allow for taxes and profits which a contractor has to include in his bid."

Moose Jaw: Question: Do you have any accurate comparisons on the cost of doing work by City Forces as compared to contractors i.e. - have you bid against general contractors?

Answer: "No. Our sewer and water construction costs are quite low. Base construction on roads by City Crews probably costs as much as it would by contract but the work is carried out more promptly".

Lethbridge: No reply as at November 8th, 1962.

Following is a chart which shows at a glance what quantity of work other cities are contracting. Dawson Creek and Calgary gave average figures for all work. The other cities gave unit percentages.

PERCENTAGE OF WORK CONTRACTED

	<u>Paving</u>	<u>Base Course</u>	<u>S.G. & G.</u>	<u>Water & Sewer</u>	<u>Structure</u>
Red Deer	100	100	100	85	95
Dawson Creek	90	90	90	90	90
Calgary	60	60	60	60	?
Medicine Hat	10	10	100	10	100
Edmonton	95	95	45	15	100
Leth-bridge					
Moose Jaw	100	10	100	Trunks	?

Paving: The majority of the cities contract the major part of the paving programme - Medicine Hat being an exception.

Base Course: The majority of the cities contract the major part of the base course construction. Medicine Hat is an exception and also Moose Jaw for reasons mentioned previously.

Sidewalks, Curb & Gutter: The majority of the Cities construct the major part of this programme.

Water & Sewer Mains: This phase of construction is split about equally. Medicine Hat, Edmonton and Moose Jaw construct most of their own mains. The other cities contract most of it. Edmonton constructs most of their own mains because they felt contractors were not competitive until the last year or so. Medicine Hat and Moose Jaw contract this work.

CONCLUSION

I think there is a general trend by municipalities to do more contracting. To some extent local conditions will dictate what the trend will be in a particular community. Due to our rapid growth in Red Deer, and because we develop all our own subdivisions in entirety we have tended toward 100% contracting. I believe that the average taxpayer, past Councils and City Staff believe that we have done the right thing.

I trust that the information provided and the opinions expressed will make it possible for the Committee to properly evaluate this very important policy.

N. J. DECK.