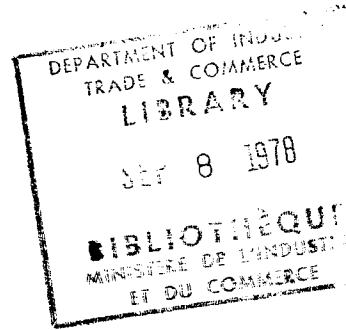


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A REPORT BY *Canada*
THE SECTOR TASK FORCE ON

THE CANADIAN CONSTRUCTION INDUSTRY

Chairman H. K. Morley



REPORT OF CONSULTATIVE TASK FORCE ON CONSTRUCTION

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REPORT OF
CONSULTATIVE TASK FORCE ON CONSTRUCTION

Construction in Canada bears a basic relationship to all other industrial activity. The recommendations offered by the Consultative Task Force on Construction, all aimed at further improving the performance of the construction industry, will, therefore, have implications for recommendations developed as a result of the deliberations of the other 22 task forces.

The business of construction is conducted in an environment characterized by keen competition and free enterprise. Also, in the performance of its work the industry increasingly exhibits, especially as a consequence of its growing "industrialization", many of the organized, mechanized and repetitive processes and procedures usually attributed to manufacturing. Bearing in mind that construction activity depends substantially upon the demands of other industries, the efficiency and effectiveness with which construction work is executed have an important influence on the profit performance of these industries. The Task Force believes, taking account of the above-noted environmental and production characteristics of construction, that the industry can, through further improvements in its efficiency, stimulate higher levels of investment in Canada.

The Task Force emphasizes that efficient construction has been especially important in periods of strong economic growth such as have characterized Canada's economy over the past 30 years. During this time total Canadian investment has ranged from 22 to 25 per cent of GNP, notably higher than in the United States and Europe, and has rivalled and paralleled the share of our GNP destined for export. An average of 60 per cent of this total is capital outlays on construction. In particular, construction expenditures account for some 30 per cent of investment in manufacturing with a significantly greater share in mineral, energy and utility projects. Because of this, the Task Force emphasizes that it is incumbent upon those having responsibility related to the industry's performance to ensure that the industry continues to improve its efficiency and to provide its products at internationally competitive prices.

The Task Force notes that construction industrialists are not without pride in the industry's record. In 1977 for example, the value of work performed by approximately 100,000 construction firms (some 80 per cent of which are in the small business category) amounted to \$35.8 billion. This includes capital and repair construction and housing. Moreover, construction over the past few years has generated direct employment for some 700,000 workers and supplied 6 to 7 per cent of the national product. For purposes of comparison, Canada's mining sector provides employment for 150,000 workers and approximately 3.4 per cent of national output; all of the forest products, primary metal and mineral product manufacturing sectors employ 425,000 workers and account for 5.5 per cent of total output. Indeed, construction's contribution equals about one-third that of all manufacturing.

The industry is a major purchaser of materials to the extent of nearly 40 per cent of the value of work performed, or some \$14 billion in 1977. For example, construction utilizes nearly all cement and concrete products consumed in Canada, a large share of heavy clay, glass, ceramic, plastic and insulation products, about half of all metal fabricated products, more than a quarter of other iron and steel products, about three quarters of the lumber and wood products used in Canada, more than a quarter of electrical products, nearly all of architectural and engineering consulting and a large share of other design and business services. Hence the industry generates a great amount of employment of an indirect character. Thus, the Task Force contends that the attributes of the industry are such that, if given special attention at senior levels of government, important benefits would accrue to the economy.

In the general vein of the above paragraphs, the Task Force wishes to focus attention upon an interesting contrast. Canada, from one viewpoint is a developed country, having a well housed industrial society, living and working in the main in advanced urban environments. From a second point of view, Canada, outside of the urban and agriculture areas, consists of a vast hinterland which remains essentially underdeveloped, providing great challenges in industrial development and potential for construction in the future. It remains for governments to ensure that an investment climate conducive to meeting these challenges is further developed and sustained so that Canada will derive maximum industrial benefits from realization of the potential that now exists.

In developing recommendations for improving industry performance both in a domestic and international sense, the Task Force focussed upon 11 issues of continuing importance to the industry. The corresponding recommendations, if implemented in concert, in the opinion of the Task Force would enable the industry to further improve its performance and thereby contribute spectacular additions to the wealth of Canada.

The identified issues are presented as follows:

- Industrial Relations
- Labour Education and Mobility
- Management Education
- Major Project Capability
- Government Procurement Procedures
- International Competitiveness
- Research and Development
- Demand Information System
- Taxes on Capital
- Government Regulation
- Government Programs

The deliberations of the Task Force in respect of each issue resulted in considerable background and support material (Appendix II). This has been written in the form of short papers to describe the issues and to provide bases for the recommendations. For purposes of convenience, however, the recommendations are themselves listed separately and attached, as Appendix I to this overview.

As Task Force discussions proceeded it became clear that the common element of efficiency and productivity permeated all of the issues and imparted a character of interdependence to them. However, the recommendations on taxation and regulation deserve particular attention in the context of their influence on the prices that the industry must ask of its clients in Canada. At a time when many industrial firms are evaluating the advantages of locating investments in Canada or elsewhere, these extra burdens on capital costs, in the form of taxation and regulation of construction, warrant careful reassessment.

Most of the recommendations, if implemented, will become effective only in the medium or longer term, and will require continuing consultative, co-operative, intensive and effective effort on the parts of both the private sector and government for the realization of their full economic potential. However, because of the industry's immense scope, and since it applies its expertise and skills in varying ways, in all sizes of operations, in every part of Canada, and under a wide range of physical and social conditions, it becomes most difficult in the absence of more concentrated and lengthy study to quantify the impact of implementation of each recommendation. In view of this, and construction's pervasive links with all sectors of the economy, it seems appropriate for impact to be considered in aggregate economic terms.

The essential economic facts in terms of value of work performed, employment etc. are well documented (Industry Profile, Appendix III). Furthermore, with its recommendations the Task Force wishes to impress upon Ministers the view that the industry is capable of considerable performance improvement in terms of productivity and efficiency. Construction's basic role in the industrial economy guarantees that improvement in productivity and efficiency will return, in the aggregate, very impressive gains to the economic capacity of the country. For example, an overall improvement in efficiency by 1980 of only 10 per cent additional to the normal trend, would result in savings of the order of nearly \$4 billion based upon the current value of work performed. Furthermore, if an accelerated rate of productivity improvement can be achieved, and some of the unnecessary governmental burdens removed, then Canadian construction prices will compare more favourably with those in competing countries. This in turn, along with improvement in other competitive factors, should induce a resurgence of investment toward the share of the national output reached in earlier years. In this regard, if investment can recover from its current level, below 22 per cent, to about 25 per cent of GNP, which to the Task Force does not seem unreasonable, expenditures would increase by an extra \$6 billion annually in real terms, with about \$3.8 billion going into construction. It should be appreciated that such expenditures would be in addition to the normal growth trend.

The considered opinion of the Task Force is that the industry's effective capacity is such that the gains noted in the above paragraph could be realized with all of the attendant benefits from

increased employment, etc., if its recommendations were to be fully implemented in a period of reasonable recovery of world demand.

The Task Force believes that authorities would be well advised to give its recommendations priority consideration for implementation at the earliest opportunity. The result would be an industry operating productively and efficiently from a more sophisticated technological base, in an improved labour relations climate, utilizing better management techniques, and capable of the largest domestic and offshore projects.

Finally, it is not the intention of the Task Force that its recommendations depend for their implementation on massive increases in government financial support or expenditures of other kinds. Some government funding will be necessary but the Task Force believes that expenditures in implementing these recommendations should be kept to a minimum and that industry's responsibilities both implicit and explicit in the recommendations probably can be discharged profitably.

APPENDIX "1"

CONSULTATIVE TASK FORCE ON CONSTRUCTION

INDUSTRIAL RELATIONS AND EFFECTIVENESS

Recommendation: That the Federal Department of Labour initiate and conduct, in conjunction with the Provincial Departments of Labour, meetings on a multi-provincial or national basis between management and their representatives, and labour representatives, both local and national, to discuss and explore in detail improved approaches to collective bargaining and to ensure that the construction industry continues to increase productivity.

LABOUR EDUCATION AND MOBILITY

Recommendation: That in order to make more effective use of Canadian construction manpower:

- a) Governments co-operate with construction's labour and management to develop appropriate and flexible ways and means to carry out the necessary education and apprenticeship programs both on site and in the classroom. The implementation of such measures is considered to be urgent and would improve the supply of skills required by the industry while creating new opportunities for Canadians and reducing our historic reliance on imported skills;
- b) Government authorities responsible for construction tradesmen's qualifications increase the degree of standardization of labour training and proficiency requirements;
- c) Governments and the industry improve the mobility of construction workers across Canada by supporting and being responsive to the work of the Joint National Task Force on Construction Mobility.

MANAGEMENT EDUCATION AND TRAINING

Recommendation: That the federal government support the establishment of the proposed National Construction Industry Education Institute within the framework of the Canadian Construction Association on an appropriate government/industry cost sharing basis with the objective of co-ordinating construction management education and training throughout Canada in co-operation with the provinces.

MAJOR PROJECT CAPABILITY

Recommendation: That the federal and provincial governments:

- a) Co-operate toward developing a national mechanism to ensure that capable competitive Canadian firms and individuals are given opportunities to participate to the maximum extent in major domestic projects, particularly in the natural resources, energy and petrochemical fields;
- b) Undertake judicious procurement practices to provide greater opportunities to the private sector in the overall management (engineer-procurement-construction) of major domestic projects so that experience at home can be used to secure and profitably complete overseas projects of similar scope;
- c) Initiate a concerted effort to make available to private industry, expertise and technology resident in government departments, public

utilities and crown corporations. This would include technical participation, as practical, of government agencies in major domestic and foreign construction projects if requested by industry;

- d) Encourage more competitive procurement of goods, labour, and services in Canada by reducing provincial and territorial practices either stated or implied and at the same time by developing mechanisms to facilitate sourcing from slow growth regions, of products and services that have a competitive potential.

GOVERNMENT PROCUREMENT PRACTICES

Recommendation: That within the comprehensive construction programs administered by federal and provincial governments and agencies, greater economies and efficiencies be obtained in the execution of their construction projects by:

- a) Maximum use of the competitive market through the services of accountable private designers and contractors;
- b) Adoption of value engineering principles in the design phase and consideration of the introduction of Value Engineering Change Proposal incentives for contractors during the construction phase;
- c) Avoidance of "fast track" procedures on major projects and the return to those involving more conventional procedures such as lump sum general contractors;
- d) Reduction of the traditional "bunching" of estimating and construction work due to tender calls being concentrated in the summer months.

Achievement of such greater economies and efficiencies should, as a matter of course, exert a beneficial influence throughout the industry especially in relation to its role as a supplier to government.

INTERNATIONAL COMPETITIVENESS

Recommendation: That the federal government, in consultation and co-operation with provincial governments, seek solutions to overcome disadvantages faced by the Canadian construction industry in the international market. Governments should aggressively encourage and support the construction industry, both at the level of industry associations and individual firms, towards expansion of profitable participation in the design, procurement, construction and management of projects abroad. (See also recommendations under "Major Project Capability").

This recommendation may be implemented in part by:

- a) Rationalizing, reorganizing and co-ordinating government agencies and departments involved with export development, to further encourage and support the Canadian construction industry's efforts in the export market;
- b) Improving and extending ways and means for co-operative government/industry involvement in order to secure and complete projects abroad and sustain market opportunities. Areas contemplated are: government-to-government administrative and cost supervisory arrangements, establishment of consortia, government support for securing bid and performance bonds and risk sharing with private enterprise;
- c) Ensuring that government incentives are consistent with industry needs and are administered in recognition of the special nature of construction contracting in foreign markets. Incentive programs should be sufficiently flexible to permit adjustments or exceptions in program criteria (e.g. Canadian content, local costs financing) in response to special circumstances;

- d) Reviewing and amending where necessary, taxation regulations governing income earned or losses incurred abroad in order to provide tax incentives to encourage Canadian firms and individuals to become more competitive in foreign markets;
- e) Strengthening Canada's diplomatic and commercial representation in rapidly expanding market areas, such as in the Middle East, Central America and certain parts of Africa as well as supporting industry-sponsored trade centres where significant market opportunities exist;
- f) Developing effective mechanisms for the secondment on a cost reimbursable basis, of Canadian business and government experts as advisers to the governments of financially viable developing countries with large potential for Canadian construction expertise, e.g. Saudi Arabia, Nigeria, Algeria. Such advisers would assist foreign governments to develop construction administration and technology. Their presence would be an influence upon foreign decision-makers in favour of Canadian goods and services;
- g) Opening of discussions with United States authorities in areas of mutual interest such as reciprocity of acceptance and access of construction products and services between Canada and the United States. An example of immediate discussions is the mutual acceptance of in-plant official inspection and standards for factory produced buildings and components.

RESEARCH AND DEVELOPMENT

Recommendation: That the federal and provincial governments co-operate in the formulation, implementation and promotion of policies and programs that would encourage and facilitate expansion of the technological knowledge base of the construction industry. Such a general broadening of the knowledge system in the industry would facilitate technological transfer to, from and within the industry, putting research into practice along with the development and application of new and improved procedures and practices. As an immediate measure governments should revise existing research and development incentive programs such as the Enterprise Development Program of the Department of Industry, Trade and Commerce to be explicitly responsive to construction industry requirements in the context of this issue.

Construction research and development is deemed by the task force to include:

- both scientific and empirically based research and development;
- research and development aimed at encouraging productivity through improved construction management technology and construction procedures and processes;
- computer software (e.g. as related to structural design and management systems).

DEMAND AND SUPPLY INFORMATION SYSTEM

Recommendation: That the federal and provincial governments co-operate with and support industry in the development and use of a central construction demand and supply information system which would serve as a base for projections of private and public construction demand over a period of from two to five years.

TAXES ON CAPITAL

Recommendation: That in order to regain the advantages of investing in Canada by reducing the capital costs of manufacturing, resource and energy development; and in order to restrain the increase in housing prices and rents, as a factor in living costs and wage demands:

- a) Federal and provincial governments eliminate, or if this is not possible, reduce sales taxes on building materials; for long-term effect and ease

of administration, partial reductions should be selective, deep and continuing, rather than temporary and shallow, across-the-board measures;

- b) Provincial governments, as a means of encouraging productivity, extend to the construction industry the exemption from sales tax of production equipment now applicable to the manufacturing and resource industries.
- c) The federal government extend to construction activity the lower rates of corporate income tax applying to manufacturing and processing.

GOVERNMENT REGULATION

Recommendation: That the impact of government regulation on the performance and costs of construction and other industrial activity be assessed, with the purpose of recommending improvements. The construction industry:

- a) Welcomes the study by the Economic Council of Canada of "economic regulation at all levels of government" commissioned by first ministers, and directs the Council's attention particularly to the benefits to be gained from greater harmonization among and within provinces with regard to construction-related codes, standards, regulations and labour qualifications; from rationalization of the requirements to protect the natural and social environment; and from reduction in the paper burden;
- b) Recommends the inclusion of economic and social criteria in the assessment of codes and standards related to the construction industry at all levels of government, and the publishing of economic impact statements, detailing in a quantitative manner the costs (on the industry and its clients) and the anticipated benefits of each code or standard;
- c) Commends provincial governments for adopting the National Building Code or uniform building standards based on it, and urges them to expedite the implementation of the latest amendments to that code and the adoption of other construction related codes and standards, in order to improve the mobility of the construction industry;
- d) Urges upon the provincial governments the need for the rationalization and streamlining of the large number of approvals in the land development process, which lead to long delays, restricted supply and high prices, in order to reduce significantly the costs which are now borne by residential, industrial and commercial clients;
- e) Supports the resource processing and similar industries in their concern that in applying environmental regulations full consideration be given to the cumulative effect of legislative requirements in all jurisdictions and by all agencies, and to the specific regional and corporate situation.

GOVERNMENT PROGRAMS

Recommendation: That the federal and provincial governments review their industrial development policies and programs to establish their impact on construction and amend these, where necessary, to ensure that the programs encourage and facilitate the efficient development of the Canadian construction industry.

APPENDIX II

BACKGROUND AND SUPPORT PAPERS

INDUSTRIAL RELATIONS AND EFFECTIVENESS

Bargaining Structure

Industrial relations in the construction industry are more complex than in other industries due to the presence of some fifteen independent craft unions and a multiplicity of employer bargaining groups. While steps have been taken in most provinces to reduce the number of bargaining situations through amalgamation of bargaining units, a major divergence of views exist between labour and management concerning appropriate structures for collective bargaining. Craft unions predominantly uphold the principle for single-trade bargaining whether it be at the local, regional, provincial or national level. The unions contend that it is essential for the management association with which they deal to be limited to employers who employ members of their union and who have a bargaining obligation or commitment to the union. They feel further that the management association dealing with their union should be required to retain its bargaining rights and not be able to surrender them or have them taken away.

On the other hand, construction management generally believes that bargaining with the various craft unions, within a sector of the construction industry, must be fully co-ordinated by a designated agency or should take place on a multi-trade basis with all crafts and all specialist contractors under the umbrella of one employer bargaining agency which would assume all employer bargaining rights.

Industrial Effectiveness

There are a number of practices in the construction industry which need to be considered to ensure that the industry maintains a high degree of productive efficiency. Some areas that could be examined are:

- a) Impact of contractual arrangements between purchasers and contractors;
- b) Methods of performing the work;
- c) Questions concerning the management of construction projects and to what degree management has effective control over the work being performed;
- d) Terms, conditions and practices which create unnecessary problems or unjustified costs;
- e) Problems concerning jurisdiction between crafts on new technology, new materials, the operation of jurisdictional disputes procedures, (jurisdictional packaging by architects and engineers) and assignments of work.

Recommendation: That the federal Department of Labour initiate and conduct, in conjunction with the provincial Departments of Labour, meetings on a multi-provincial or national basis between management and their representatives and labour representatives, both local and national, to discuss and explore in detail improved approaches to collective bargaining and to ensure that the construction industry continues to increase productivity.

LABOUR EDUCATION AND MOBILITY

The construction industry directly employs approximately 7 per cent of the work force or about 700,000 people. In addition, there are many others who are employed in the industry as managers and designers or indirectly depend on construction for their livelihood such as material suppliers and consultants of various kinds. It is important for the construction industry and the economy that sufficient numbers of properly skilled workers are available and the existing manpower is used efficiently. The industry's productivity can be increased through greater concern for and use of motivational techniques and programs for construction labour.

A variety of educational programs exist for labour training across Canada which are particularly comprehensive in the skilled trades. The existing programs have the support of labour, management and provincial and federal governments to varying degrees. Yet, even with the system of courses available to construction workers, labour shortages occur regionally and some potentially large skilled labour supply problems are anticipated for major resource or related projects.

These imbalances can be accounted for in part by the difficulties associated with identifying construction manpower demand and supply and also the site specific nature of the work which requires a mobile work force. It has been recognized by the industry and government that in order to meet the highly regional needs of construction clients, it will be essential that the construction work force continue to be mobile and be increasingly free to move in response to the rapidly changing demands placed on construction. A Joint National Task Force on Construction Mobility made up of labour and management representatives has been established by the Canada Employment and Immigration Commission to review the situation and make recommendations aimed at facilitating the movement of construction workers across Canada.

It is important that governments and the private sector develop means of creating more stable employment conditions in construction by reducing its relatively large cyclical and seasonal demand swings or establishing mechanisms (such as the Construction Demand and Supply Information System) that will permit the industry to respond more effectively to demands placed on it. The long lead time required for apprenticeship training and the seasonal and cyclical fluctuations in labour demand often reduce the desire by construction workers to enter apprenticeship programs which can result in skilled shortages particularly in periods of high demand. Finally, the importation of foreign workers at times when domestic manpower is available diminishes the employment opportunities for Canadian construction labour and adds social and economic inefficiencies.

Recommendation: That in order to make more effective use of Canadian construction manpower:

- a) Governments co-operate with construction's labour and management to develop appropriate and flexible ways and means to carry out the necessary education and apprenticeship programs both on-site and in the classroom. The implementation of such measures is considered to be urgent and would improve the supply of skills required by the industry while creating new opportunities for Canadians and reducing our historic reliance on imported skills;
- b) Government authorities responsible for construction tradesmen's qualifications increase the degree of standardization of labour training and proficiency requirements;
- c) Governments and the industry improve the mobility of construction workers across Canada by supporting and being responsive to the work of the Joint National Task Force on Construction Mobility.

MANAGEMENT EDUCATION AND TRAINING

Earlier this year, the Construction Industry Development Council in again addressing the subject of construction management and professional education and training (the council first studied the subject in detail in 1973) recommended that a national Construction Industry Education Institute be established, with government/industry financial support, as a means of co-ordinating and improving construction management education and training.

The Canadian Construction Association (CCA), because of its prominent position among the industry associations and credibility with the industry in all parts of Canada, is the most appropriate vehicle to carry the concept of the proposed institute to practical realization given appropriate funding on a government/industry cost sharing basis. Since much of the work and many of the institute programs would reflect local or regional needs, provincial governments would be asked to co-operate both financially and administratively in the operation of the institute. The secretariat for the institute housed within the CCA would serve the educational needs of a wide cross-section of the industry on a national, provincial and local basis. Under the direction of a multi-disciplinary board it would be as responsive as possible to the education needs of the industry and its management, professional and technical personnel. Strong support of such an institute is assured from educators, the professions and industry. A better managed construction industry through improved education of its personnel will greatly enhance its productivity and effectiveness and provide substantial benefits to the Canadian economy. More specifically the institute will:

- a) In collaboration with educators and industry groups provide a central body of knowledge or information about existing courses and programs which are relevant to the educational requirements of the industry;
- b) Improve the access of current and potential industry members to this body of knowledge through regional and local dissemination programs;
- c) Assist in creating an environment which will motivate members of the industry including managers, supervisors, foremen, professionals and technicians to seek further education relevant to their career development;
- d) Ensure that the knowledge made available is appropriate to the user circumstances with special emphasis on application aspects;
- e) Promote, facilitate and reinforce the use of existing knowledge by industry members in their work environment;
- f) Strive for national recognition of construction management courses on an individual basis or collectively as part of a formalized program.

The construction industry employs more than 100,000 persons in managerial and technical positions. It has been estimated that this group will grow at the rate of about 4 per cent annually and a further 3 per cent annually must be replaced because of retirement and other forms of attrition. This means that about 7,000 new people per year will be required for management, professional and technical jobs. The educational needs are therefore significant especially when the retraining and upgrading programs are accounted for in the total plan.

Recommendation: That the federal government support the establishment of the proposed National Construction Industry Education Institute within the framework of the Canadian Construction Association on an appropriate government/industry cost sharing basis with the objective of co-ordinating construction management education and training throughout Canada in co-operation with the provinces.

MAJOR PROJECT CAPABILITY

The construction and design sectors in Canada are made up of capable firms which have proven experience in such fields as mining, hydro and nuclear electricity, pipelines, forestry, transportation and communications. Canadian firms also have specialized skills in working in northern climates. In many instances, however, Canadian-controlled firms have not been given adequate opportunities in the past to compete for major projects, especially those in the natural resource, energy and petrochemical market areas.

The federal government along with some provincial governments have recognized this shortcoming and have established industrial benefit policies to maximize Canadian participation in major projects not only by construction and design firms but also by other key industry sectors. It is important that a nationally consistent approach at the policy level be taken to increase the effectiveness of government and industry activities aimed at expanding domestic market opportunities for Canadian firms. Government procurement, for example, represents an important part of the domestic market and the adoption of uniform procurement policies on the part of all governments would, when implemented, provide a great stimulus to and facilitate the establishment of internationally competitive enterprises thus offering prospects of long-term industrial benefits for the Canadian economy.

Specialized technical expertise exists within certain government agencies and these organizations often take the lead role in the engineering design, procurement and construction management of major public works projects in Canada. The lack of this experience in private firms impedes their efforts to secure projects of similar scope in foreign markets.

Domestically, the competitiveness of construction firms is restricted because of local preferential purchasing policies exercised in several provinces, the Yukon and the Northwest Territories, increase the cost of construction in those areas and inhibit the national operation of construction firms.

Recommendation: That the federal and provincial governments:

- a) Co-operate toward developing a national mechanism to ensure that capable competitive Canadian firms and individuals are given opportunities to participate to the maximum extent in major domestic projects, particularly in the natural resources, energy and petrochemical fields;
- b) Undertake judicious procurement practices to provide greater opportunities to the private sector in the overall management (engineer-procurement-construction) of major domestic projects so that experience at home can be used to secure and profitably complete overseas projects of similar scope;
- c) Initiate a concerted effort to make available to private industry, expertise and technology resident in government departments, public utilities and crown corporations. This would include technical participation, as practical, of government agencies in major domestic and foreign construction projects if requested by industry;
- d) Encourage more competitive procurement of goods, labour, and services in Canada by reducing provincial and territorial practices either stated or implied and at the same time by developing mechanisms to facilitate sourcing from slow growth regions, of products and services that have a competitive potential.

GOVERNMENT PROCUREMENT PRACTICES AS A MEANS FOR IMPROVING
CONSTRUCTION PRODUCTIVITY AND EFFICIENCY

The construction industry's efforts to increase its productivity can be assisted by the senior governments by means of the procedures they follow in the execution of their very considerable construction programs. The Government of Canada, for example, is the largest single buyer of construction services in the country. The provincial governments, in the aggregate, initiate a considerably larger volume of construction. At both levels construction contracts are administered by a variety of departments, power commissions, housing authorities and other crown agencies. The Task Force contends that the productive, efficient discharge of the related work can have beneficial effects throughout the industry. Such federal and provincial bodies generally follow "the contract method" in the execution of their projects. That is, they engage suitable architects and/or consulting engineers to design them and contractors to build them. Similarly, if project managers or construction managers are used, proposals are invited from private firms engaged in this type of assignment. In some cases, however, "in-house" staff have been recruited to perform these functions not only for repair and maintenance work but also for new construction.

This procedure lacks the disciplines of the competitive market and the accountability of private firms that are conducive to economy and efficiency and, in turn, savings to the taxpayers. There have been a number of formal inquiries at all three levels of government conducted by independent chartered accountants. In all such instances the reports have concluded that public bodies fail to account for all of their actual costs when carrying out construction projects with their own forces and that the use of the competitive contract method is in the public interest. Moreover, its use assists in the development of the greater capability of firms in the private sector and their ability to compete for work both at home and abroad. The maximum use of the private sector should accordingly be made in the execution of projects financed by governments or their agencies.

In 1975 the Treasury Board of Canada issued "Policy and Guidelines on Contracting in the Government of Canada". The first policy enunciated was that "government contracting shall be conducted in a manner which will (a) achieve the optimal combination of quality, time and the total life-cycle costs of the acquisition..." Life-cycle costing is subsequently supported in the guidelines in some detail but the document contented itself to drawing the subject to the attention of contracting departments and agencies rather than making the procedure mandatory.

It is significant that the U.S. government has included for a decade or more a standard "Value Engineering Change Proposal" incentive provision in the construction contracts of the General Services Administration and other major contracting agencies. This provision invites contractors to submit proposals designed to reduce either capital costs or life-cycle costs on the projects they are building and undertakes to pay them a set and substantial share of the savings. Furthermore, the GSA has for several years required its design consultants on projects of over a certain size to have their design group participate at GSA expense in a 40-hour Value Engineering seminar before commencing their work. The savings obtained by these procedures are reported to exceed many times over the outlays involved. Senior governments in Canada might well similarly benefit from the application of value engineering principles in the design and construction phases of many of their projects and thereby encourage greater overall efficiency in these projects.

Some of the projects initiated by federal and provincial government departments and agencies in Canada are extremely large and complex undertakings. There has been a tendency in recent years to carry out such projects on a "fast track" basis -- i.e. by commencing site work long before the design has been well advanced. It is contended that the increased costs of design and construction work that are experienced under this procedure are more than offset by earlier occupancy and reduced financing costs.

There is a strong body of opinion in the industry that, in practice, these objectives are not commonly achieved on major public projects. Perhaps the series of bureaucratic approvals related to them is such that the decision-making process is severely inhibited. In any event, it is debatable that either time or total costs are saved and whether more time spent on design would not lead to an earlier completion date. Productivity on major public projects that have been built on a "fast-track" basis has typically suffered seriously. Moreover, lax practices acquired on such projects have in turn adversely affected productivity as crews move from the public project to other construction sites. The general avoidance of "fast-track" procedures on major publicly financed projects is therefore most desirable.

Government fiscal years traditionally commence in the spring and there has therefore been a general tendency for public bodies to schedule most of their construction tender calls in the summer months. This practice has consequently exacerbated the seasonal nature of much of the construction program. Furthermore, concentration of estimating activities is not conducive to the most competitive bidding being received because of the time constraints that are placed on the preparation of each tender. Indeed, some firms may not be able to compete for the project, although they would be ready to do so at another time. Similarly, the bunching of construction starts and ensuing job-site activities may well lead to relative shortages of resources, higher costs and lower productivity.

Recommendation: That within the comprehensive construction programs administered by federal and provincial governments and agencies, greater economies and efficiencies be obtained in the execution of their construction projects by:

- a) Maximum use of the competitive market through the services of accountable private designers and contractors;
- b) Adoption of value engineering principles in the design phase and consideration of the introduction of Value Engineering Change Proposal incentives for contractors during the construction phase;
- c) Avoidance of "fast track" procedures on major projects and the return to those involving more conventional procedures such as lump sum general contracts;
- d) Reduction of the traditional "bunching" of estimating and construction work due to tender calls being concentrated in the summer months.

Achievement of such greater economies and efficiencies should, as a matter of course, exert a beneficial influence throughout the industry, especially in relation to its role as a supplier to government.

INTERNATIONAL COMPETITIVENESS

Over the past decade, but more particularly in the past four or five years, there has been an enormous growth in demand for industrial plants, energy, building projects and structures of all kinds in countries around the world. The most spectacular increases in demand have occurred in countries with large surplus foreign exchange earnings where immense sums of money have been budgeted with the objective of accelerating development in the industrial and social infrastructure.

The Canadian construction industry, while servicing this demand to an increasing extent, is not obtaining a share of awarded contracts which reflects the capability of the industry to participate.

The advantages of profitable participation are important to the economy of Canada. These can be in terms of profitable operations and foreign exchange earnings for Canada, a means of partially and beneficially countering domestic cyclical construction demand and the export of construction related goods and services.

Canadian construction firms in the international market are working at a disadvantage compared with competing firms from countries receiving special government or national support. For example, several European and Asian countries support their construction industry's efforts in the export market by: providing insurance against currency fluctuations; tax rebates on exports; indirect tax incentives for exports; tax exemptions on export earnings from construction projects; insurance against export losses; direct export tax incentives; partial or total exemption from tax of foreign branch income; deferral of export income for tax purposes. Canadian companies can avail themselves of only one and partly another of these eight incentives; insurance against export losses and partial deferral of export income respectively. European countries, notably France and Germany, are reliably reported to provide their construction companies with all eight incentives and Britain with six of the eight. It follows that the construction companies of these countries obtain major percentages of the world export market.

Although export opportunities exist in the United States and other traditional market areas for Canadian firms, the major new markets occur in developing countries where there is relatively little Canadian government presence. In some of these areas Canada is not represented directly through trade posts (Arabian Gulf, Ecuador, Panama, etc.). Industry contends that in other countries there is insufficient staff to service industry's needs (e.g. Saudi Arabia, Nigeria, Algeria).

Several countries have asked Canada to second various Canadian experts into their civil services with the foreign country concerned paying all costs in advance. The Americans are heavily involved in this type of scheme, both financially and commercially, particularly in the Middle East. At the present time no mechanism exists within the Canadian government to implement such a secondment program; Canadian International Development Agency, for example, does not handle cost-reimbursable programs.

Canadian government support of the construction industry in addition to being less than that offered to international competitors is also fragmented. A construction firm wishing to avail itself of federal export assistance may find it necessary to deal with a number of agencies and departments with different objectives such as the Export Development Corporation, the Canadian Commercial Corporation, the Canadian International Development Agency, the Department of Industry, Trade and Commerce (Office of Overseas Projects; Construction and Consulting Services Branch, etc.), Department of National Revenue and so on. This federal arrangement often proves confusing and discouraging to prospective export contractors and industry has frequently stated that it frustrates industry efforts.

Canadian firms have lacked sufficient opportunities to undertake broad (engineer - procure - construct) responsibilities on major public works projects since government agencies have often maintained the lead role. The lack of this type of experience has impeded the accomplishments of Canadian firms in foreign markets because buyers of construction abroad will often judge a firm's potential capabilities by that firm's performance at home.

Recommendation: That the federal government, in consultation and co-operation with provincial governments, seek solutions to overcome disadvantages faced by the Canadian construction industry in the international market. Governments should aggressively encourage and support the construction industry, both at the level of industry associations and individual firms, towards expansion of profitable participation in the design, procurement, construction and management of projects abroad. (See also, recommendations under "Major Project Capability").

This recommendation may be implemented in part by:

- a) Rationalizing, reorganizing and co-ordinating government agencies and departments involved with export development, to further encourage and support the Canadian construction industry's efforts in the export market;
- b) Improving and extending ways and means for co-operative government/industry involvement in order to secure and complete projects abroad and sustain market opportunities. Areas contemplated are: government-to-government administrative and cost supervisory arrangements, establishment of consortia, government support for securing bid and performance bonds and risk sharing with private enterprise;
- c) Ensuring that government incentives are consistent with industry needs and are administered in recognition of the special nature of construction contracting in foreign markets. Incentive programs should be sufficiently flexible to permit adjustments or exceptions in program criteria (e.g. Canadian content, local costs financing) in response to special circumstances;
- d) Reviewing and amending where necessary taxation regulations governing income earned or losses incurred abroad in order to provide tax incentives to encourage Canadian firms and individuals to become more competitive in foreign markets;
- e) Strengthening Canada's diplomatic and commercial representation in rapidly expanding market areas, such as in the Middle East, Central America and certain parts of Africa; as well as supporting industry sponsored trade centres where significant market opportunities exist;
- f) Developing an effective mechanism for the secondment, on a cost reimbursable basis, of Canadian business and government experts as advisers to the governments of financially viable developing countries with large potential for Canadian construction expertise, e.g. Saudi Arabia, Nigeria, Algeria. Such advisers would assist foreign governments to develop construction administration and technology. Their presence would be an influence upon foreign decision-makers in favour of Canadian goods and services;
- g) Opening of discussions with United States authorities in areas of mutual interest such as reciprocity of access to construction products and services between Canada and the United States. An example of immediate interest is the mutual acceptance of in-plant official inspection and standards for factory produced buildings and components.

RESEARCH AND DEVELOPMENT

As a general statement based upon historical performance the Canadian construction industry has, as an industry, conducted research and development work on only a limited scale. As matters now stand, few firms sustain research establishments of any significance and construction research and development is estimated to account for only 0.16 per cent of total expenditures in construction. (This percentage includes government expenditures on construction research and development).

This situation contrasts sharply with the related experience in many technologically developed countries where expenditures (by industry and governments) on construction research and development amounts to between one and three per cent of the value of construction put in place on an annual basis.

At the level of the individual firm there are also sharp contrasts. For example, many of the major construction companies operating in the international arena maintain, as a necessary and integral part of their operations, extensive science and empirically based research and development facilities. Such firms have, almost without exception, an enviable history of success in the conduct of large projects in both their home countries and internationally.

Against this background, many of the Canadian industry's leaders, researchers, association heads and prominent representatives of both business firms and government have advocated, over the years, an increased construction research and development effort to be conducted in the main by the industry for the industry.

In this regard, there appears to be a broad consensus amongst those knowledgeable in the practice of construction from both industry and government that a broadening of the research base, especially at the level of the individual firm, would enhance the knowledge system in the industry. This enhancement would have several positive effects over time. For example, the industry's scientific and technological base would expand more consistently with industry needs. This development would give rise to the gradual establishment and maintenance, especially at the level of the individual firm, of a cadre of personnel qualified in a research and development sense. In turn, such a cadre of research workers would complement the knowledge system in the industry through facilitating transfer of technology to and within the industry. That is to say, the transfer of technology from other industrial sectors to the construction sector, its application (and vice versa) and the transfer of existing knowledge developed as a result of research in such establishments as the Division of Building Research of the National Research Council. In this way the research to practice linkage would be nourished, expanded and strengthened. As a result industry's consciousness with respect to research and development would be gradually but increasingly elevated. Moreover, research and development could be expected to more closely correspond with industry's needs in areas of, for example, winter construction, energy conservation and industrialized methods.

It should be appreciated that a great deal of valuable research and development work has been conducted over the years by the above-named Division of Building Research and other such institutions. One of the main difficulties has been the practical application of the results of research and development. And, of course, as noted above, the problem of putting research into practice would be ameliorated to an increasing degree with the advocated expansion of the industry's research and development-related base.

The federal government in its recent budget gave recognition to the need for expansion of research and development work through an additional 50 per cent write-off for incremental research and development expenditures. Given the historically limited scale of research and development performed by the construction industry, this increased stimulus should prove helpful. Under the new proposals when combined with existing incentives, all but the smallest construction firms would pay just over 20 cents on the dollar for incremental research and development. In the Atlantic Region, these firms would pay about 18 cents on the dollar. Some additional calculations are attached to illustrate the actual differential impact on firms that are taxable at various rates.

However, government should, as a matter of urgency, revise existing policies to permit the extension of such programs as the Department of Industry, Trade and Commerce Enterprise Development Program to be responsive to the construction industry's research and development needs.

Recommendation: That the federal and provincial governments co-operate in the formulation, implementation and promotion of policies and programs that would encourage and facilitate expansion of the technological knowledge base of the construction industry. Such a general broadening of the knowledge system in the industry would facilitate technological transfer to, from and within the industry, putting research into practice along with the development and application of new and improved procedures and practices. As an immediate measure governments should revise existing research and development incentive programs such as the Enterprise Development Program of the Department of Industry, Trade and Commerce to be explicitly responsive to construction industry requirements, in the context of this issue.

Construction research and development is deemed by the task force to include:

- both scientific and empirically based research and development;
- research and development aimed at encouraging productivity through improved construction management technology and construction procedures and processes;
- computer software (e.g. as related to structural design and management systems).

Research and Development Tax Incentive
With an Incremental R&D Expenditure of \$200,000

	(a)	(b)	(c)	(d)	(e)
	<u>100% Write-off No Tax Credit</u>	<u>5% R&D Tax Credit</u>	<u>150% Write-off on Investment R&D</u>	<u>150% Write-off 5% Tax Credit⁽³⁾</u>	<u>150% Write-off 10% Tax Credit</u>
I - Sales	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
less					
II - Total R&D	\$200,000	\$190,000 ⁽¹⁾	\$200,000	\$190,000 ⁽¹⁾	\$180,000 ⁽¹⁾
III - 150% of incremental income	--	--	\$100,000	\$100,000	\$100,000
IV - Taxable income	<u>\$200,000</u>	<u>\$210,000</u>	<u>\$100,000</u>	<u>\$110,000</u>	<u>\$120,000</u>
Taxes payable (after ⁽²⁾ tax credit)		<u>Tax Credit of \$ 10,000</u>		<u>Tax Credit of \$ 10,000</u>	<u>Tax Credit of \$ 20,000</u>
A - 19%	\$ 38,000	\$ 29,900	\$ 19,000	\$ 10,900	\$ 2,800
B - 24%	\$ 48,000	\$ 40,000	\$ 24,000	\$ 16,400	\$ 8,800
C - 42%	\$ 84,000	\$ 78,200	\$ 42,000	\$ 36,200	\$ 30,400
D - 48%	\$ 96,000	\$ 90,800	\$ 48,000	\$ 42,800	\$ 37,600

NOTES: (1) The tax credit is taxable. Thus, the total R&D expense must be reduced by the amount of the tax credit.

(2) 1977 Federal and Ontario combined corporate tax rates were used:

A - Manufacturing and processing profits eligible for small business deduction - rate 19%

B - Non-manufacturing and non-processing profits eligible for small business deduction - rate 24%

C - Manufacturing and processing profits not eligible for small business deduction - rate 42%

D - Other - rate 48%

(3) Column (d) is the 150% Write-off on incremental R&D expenditures and the 5% tax credit combined.

(4) Column (e) is the 150% Write-off on incremental R&D expenditures and the 10% tax credit combined.

DEMAND AND SUPPLY INFORMATION SYSTEM

For decades, the wide fluctuations in construction demand have been a significant problem for the industry. Construction demand and the capacity of the industry to respond are closely linked to Canada's economic performance.

The construction industry cannot influence economic cycles even though these, in large measure, determine the industry's general performance in terms of efficiency and productivity. Unlike the manufacturing sector, it does not have truly effective means (through inventory control, for example) of coping with cyclical swings. The industry can, of course, counter such swings by increasing its activity in the export field, among other things, but this type of action, however important, cannot compensate to the extent desirable or necessary with the pervasive problem the industry experiences because of fluctuating domestic demands.

While a great deal of demand-related information is currently available, the amalgamation of these data into a single demand forecasting system would permit the construction industry to utilize its capacity more efficiently. In addition, data on the future demand for construction would provide educational institutions and labour unions with the opportunity to ensure that adequate numbers of trained workers were available to coincide with the particular needs of the housing, non-residential building and heavy construction sectors of the industry. The data could also be of benefit to other sectors of the Canadian economy enabling them to gauge their production capabilities in relation to the anticipated demand for goods and services arising from construction activity.

Economic and industrial development are the responsibilities of the federal and provincial governments. The federal government in co-operation and collaboration with the provincial governments should initiate and support a construction demand information system by making known plans for major capital projects. In time, data from major metropolitan areas should also be included in the system.

As a further step toward improving the efficiency of the construction industry, the senior levels of government should review their investment plans and jointly determine the most appropriate timing for their major construction projects in order to avoid simultaneous peaking which places a costly strain on the industry and the economy.

Recommendation: That the federal and provincial governments co-operate with and support industry in the development and use of a central construction demand and supply information system which would serve as a base for projections of private and public construction demand over a period of from two to five years.

THE IMPACT OF TAXES ON CAPITAL

Higher construction costs in Canada than in the United States have been identified by a number of client sectors (e.g. petrochemical, paper, steel, non-ferrous metals, machinery, electrical products) as a significant factor in investment location decisions. Rising costs for shelter are also a heavy weight in the cost-of-living trend, which is a major element in negotiating wages and salaries.

In this regard, the Task Force points to the heavy burden of taxes imposed by all levels of government on the construction industry. A portion of this is justified to meet the costs of necessary government services, but some are counter-productive in their effect on the industry and much of the burden must be passed on to clients in the form of higher prices. These are, in effect, taxes on capital.

The Cumulative Tax Burden on Inputs to Construction Activity

Leaving aside taxes on corporate income and various administrative costs required by governments, the construction industry pays taxes on inputs which may cumulate to nine per cent of the final construction price.

Mandatory employer payments for employee benefit plans in the construction industry represent an average additional cost of almost five per cent of wages and salaries paid. These do not include the many benefits and other payments required by industrial agreement or custom. Since the labour cost component is nearly one-third of total expenses, it follows that these compulsory levies average approximately 1.5 per cent of total costs in the industry. In addition to these payroll taxes, governments collect indirect non-commodity taxes such as municipal taxes, business taxes, water taxes and motor vehicle licences, which collectively account for 0.4 per cent of total expenses.

Although there are limited data on sales and excise taxes, the five per cent federal sales tax, at \$356 million in 1976/77, equalled some one per cent of the value of all construction activity, and the burden of retail taxes would be higher in most provinces.

But the impact is uneven. Materials for most government projects are exempted or the tax is rebated. But industrial and other private clients must pay the tax. The negative effect of the tax is recognized in the exemption of the "prefabrication" component of ready-mix concrete, structural steel, laminated wood products, aluminum prefabrication, etc., which otherwise would be penalized more heavily than materials prefabricated on the construction site.

With these exemptions and the fact that materials usually account for more than half of the inputs, the federal tax may impose an increase on private construction prices of 1.5 to 2.0 per cent. Depending upon the location of construction and the partial exemptions, provincial sales taxes of five, seven, eight or eleven per cent would add a further 1.5 to four per cent to private construction prices. Alberta, of course, has no retail sales tax.

Similar provincial rates applied to construction equipment purchases could add a further 0.5 to one per cent to the final construction cost. In summary government imposed costs on private construction (ex Alberta) amount to approximately five to nine per cent of total input costs distributed as follows:

1 Based on Statistics Canada - Employer Labour Costs in Canada 72-618, Corporation Financial Statistics 61-207.

Government-Imposed Input Costs on Private Construction

by Type of Levies

in Percentage of Total Costs

<u>Type</u>	<u>Per Cent</u>
Payroll taxes	1.5
Indirect non-commodity taxes	0.4
Materials sales taxes - federal	1.5 - 2.0
- provincial	1.5 - 4.0
Equipment sales taxes - provincial	0.5 - 1.0
TOTAL	5.4 - 8.9

Given that payroll levies have sharply increased in the past two years, more particularly in the area of provincial health and hospital insurance premiums, and that property and other municipal taxes have increased comparatively faster than certain other types of expenses, it would seem reasonable that input taxes now assume an even larger proportion of total construction costs than the rough estimates suggest. To the extent that these government-imposed costs are not absorbed by the industry in the form of reduced profit margins, but are passed through to the user, whether households or other industries, capital costs for structures, plants and housing will be increased correspondingly.

a) Sales Tax on Construction Materials

For industrial clients these taxes appear as higher capital costs and could contribute to the decision to locate manufacturing and resource facilities in other countries. When construction does go ahead, the taxes become imbedded in higher overheads, which contribute to higher prices for Canadian goods and services. Applied to the residential sector, these taxes contribute to increases in the cost of housing and to the general pressure for wage increases to offset rising living costs. This effect was recognized in the postwar period of growth from 1945 to 1963 when building materials were exempted from federal sales tax.

Although re-introduced in 1963 and raised to 11 per cent by 1965, the federal government in 1976 did reduce the rate to 5 per cent on building materials levied at the manufacturers' level. The prefabrication component of a number of materials, such as ready-mix concrete is exempted. Moreover the recent federal budget has facilitated reductions of two per cent or three per cent for a short period in the retail sales tax levied by the provinces. In the past there has been action by provincial governments exempting construction materials from their retail sales taxes. New Brunswick, for example, applied an exemption on a widespread basis (rescinded early in April 1978) whereas Nova Scotia introduced a rebate system for certain lower cost housing projects. As indicated above, certain institutional projects, such as hospitals and schools, qualify for exemptions or rebates at both the federal and provincial levels. Alberta does not have a sales tax.

In general, however, sales taxes apply to construction materials and components used in private construction and constitute a tax of appreciable size on capital investment. As such, their imposition is clearly in conflict with other government policies designed to stimulate capital outlays on new factories or additions, housing, etc.

b) Sales Tax on Construction Equipment

One of the glaring anomalies in the taxation field is that, whereas the manufacturing and resource industries have long enjoyed an exemption from sales taxes on their production equipment, the construction industry has generally been subjected to heavy taxes whenever its members have sought to improve their productivity by buying or even renting more efficient machinery and equipment.

This situation was finally recognized in November 1974 by the federal government when it exempted construction equipment from its then 12 per cent sales tax at the manufacturers' level. The Ontario government introduced a temporary exemption in April 1975 for construction equipment and machinery but this expired at the end of 1977. Accordingly, the nine provinces with sales taxes all add to the cost whenever a contractor buys more efficient equipment to improve productivity. The premium paid on a \$100,000 unit in Quebec is \$8,000 and, until the recent federal budget, was \$11,000 in Newfoundland.

c) Inter-Provincial Aspects of Retail Sales Taxes

The administration of provincial sales taxes has often impeded the orderly flow of inter-provincial trade and construction mobility. Therefore, one of the additional by-product benefits of the removal of retail taxes from construction materials and equipment is that it would also remove a source of inequity in inter-provincial bidding. For example, some provinces, such as British Columbia and Quebec, tax the goods brought in by manufacturing contractors from other provinces at the full laid down value (e.g. including shop labour, transportation, etc.) whereas for firms with plants within the province, the tax is applied to the material component only. This tax differential can be appreciable and destroy the competitive position of the firm located in another province. Similarly, the provinces have somewhat different bases for calculating the sales tax on used construction equipment moved by a contractor over provincial boundaries. The differentials are less than in the past but British Columbia for example, levies its tax on the full value of the equipment, even if it is in the province for only a short time.

d) Corporate Income Tax Rate

An argument similar to that for sales taxes could be made for the effect of the higher rate of federal corporate income tax on construction activity (36 per cent) than on manufacturing (30 per cent). The differential also applies to the small business rate with construction and other sectors at 15 per cent and manufacturing at 10 per cent. Most provincial rates do not discriminate. Analysts still disagree about the extent to which corporate taxes are passed on to the next level of activity. But it would appear reasonable, given the high degree of competition in most elements of the construction industry, that a large part of a reduced tax rate would be reflected in prices to customers.

e) Capital Cost Allowances

In recent years the federal government has sought to reduce the capital cost allowances on construction equipment, and to restrain the ability of the taxpayer to apply write-offs from multiple-unit residential buildings (MURB's) to overall revenues. These efforts have been blocked in the former case. Last year MURB write-offs were continued but the rate of capital cost allowances on wood-frame buildings was reduced to the five per cent applicable to other buildings. The capital cost allowance rates applying to both structures and equipment are important to the industry, and it is highly desirable to retain the incentive features of these allowances.

Recommendation: That in order to regain the advantages of investing in Canada by reducing the capital costs of manufacturing, resource and energy development; and in order to restrain the increase in housing prices and rents, as a factor in living costs and wage demands:

- a) Federal and provincial governments eliminate, or if this is not possible, reduce sales taxes on building materials; for long-term effect and ease of administration, partial reductions should be selective, deep and continuing, rather than temporary and shallow, across-the-board measures;
- b) Provincial governments, as a means of encouraging productivity, extend to the construction industry the exemption from sales tax of production equipment now applicable to the manufacturing and resource industries;
- c) The federal government extend to construction activity the lower rates of corporate income tax applying to manufacturing and processing.

GOVERNMENT REGULATIONS

Most government regulations have been developed for the specific purpose of increasing public safety or for protection of the public interest. At the time of issue each regulation was assumed to carry a net benefit for the groups directly involved. But there has been too little concern for the indirect and secondary effects as well as the cost of the regulatory process itself. Moreover, with the passage of time, changes in costs and benefits have not been assessed, nor has the cumulative effect of overlapping regulations within and among the several levels of government.

But recently the federal government has announced that all new federal regulations in health, safety and fairness (HSF) areas must be subjected to a benefit-cost assessment which will be made publicly available in sufficient time prior to promulgation of the regulations to allow for private sector representation to sponsoring departments. Ontario and other provinces have made similar moves.

Of even wider significance was the agreement by the first ministers in February 1978 that "the whole matter of economic regulation at all levels of government should be referred to the Economic Council¹ for recommendations for action in consultation with the provinces and the private sector."

The construction industry welcomes this initiative and would direct attention to the benefits to be gained from greater harmonization among and within provinces with regard to construction related codes, standards, regulations and labour qualifications; from rationalization of the requirements to protect and improve the natural and social environment; and from reductions in the paper burden.

The federal and some provincial governments have moved to reduce the burden of paperwork particularly as it affects small businesses. The construction industry with its high proportion of small units is concerned not only that the flow of paper be restrained but that it also be made more effective in disseminating useful technical and market information.

Urban Land Development

In the residential sector deep concern has been expressed over the impact on costs of the large number and successive layers of approval required in the development of land. In some provincial jurisdictions up to 90 steps in the approval required in the development of land. In some only is there a large direct cost for administration incurred both by government and the land developers, but substantial carrying charges are accumulated on land held for five years or more before all clearances are received. These costs effectively screen out most small developers, who do not have the working capital to wait out the process.

Even more significant in raising the price of residential and industrial land much higher than in most American locations, is the effect of restricting the supply of developable land in Canada. With a better supply of land available for development, and final approval systems as short as three months, the real land costs to builders and clients in most United States jurisdictions is a fraction of the Canadian (a typical housing lot in the U.S. at \$8-10,000 would compare with a lot in Canada at \$20-25,000). Canadian developer-builders are showing both their competitive capabilities and their reaction to the Canadian market situation by rapidly increasing their activity in the United States.

In part the Canadian situation reflects the attitudes of small but highly vocal groups which advocate "no growth" or "slow growth", and attempt to achieve their aims by restricting land development. The effect of limited supply is high prices for existing as well as newly developed property.

Whatever the objectives of the approval systems, it would appear that governments, especially the provinces, would have much to gain by reducing the excessive requirements of local authorities, by setting time limits on approval processes and perhaps by having a number of requirements approved on a concurrent and mutually acceptable basis.

¹Federal-Provincial Conference of First Ministers, Conclusion of the Conference

Construction Codes and Standards

The provincial governments are to be commended for their general adoption of the basic National Building Code. However, the code is continually being updated to reflect changes in technology, as well as economic and social factors. Only a few provinces have arranged for any degree of continuity in adoption of amendments, while others for various reasons have not approved recent changes. There are, therefore, considerable differences in the precise application of the National Building Code among the provinces, and sometimes within the provinces, which add to planning and performance costs of contractors and others attempting to operate across provincial boundaries.

The variations in application of the fire, safety and other codes and regulations across the country increase the barriers and multiply the costs faced by the industry. Provincial governments, in recognition of the benefits of lower costs resulting from greater harmonization are urged to expedite their adoption of construction-related codes and standards developed by nationally representative bodies.

It is further recommended that the criteria for the development of codes and standards be broadened to include economic and social factors. Traditionally in the construction industry, conditions of safety, technical or structural integrity or legal consistency have been the principal criteria used. With the recent pressures of inflation, rising energy and construction costs and social problems associated with the built environment, a new awareness for the social and economic implication of building regulations has emerged. This does not mean that these new factors would outweigh the others, but rather that they would form an integral part of the basic assessment.

Environmental Regulation

The renewed concern for the natural and social environment is shared by the construction industry. However, governments must appreciate the substantial costs involved in change and delay. Even where no substantive change is required, the delays in the process of study and approval increase the costs of working capital especially when, in our climate, a construction season is lost.

The incidence of regulations for protection of the natural environment can be particularly onerous on the resource extraction and processing industries, which, as the keystones of the Canadian economy, are among the principal clients of the construction industry. Major cost increases and other problems may arise from conflicting or overlapping regulations, or requirements which pay insufficient heed to competitive conditions, or to the specifics of the regional or corporate situation. Continued investment in the resource sector is a necessity for the economic health of most regions, as well as the country as a whole. If, because of unrealistic requirements this new investment is not placed in Canada, major elements of the construction industry would be among the first to suffer.

Recommendation: That the impact of government regulation on the performance and costs of construction and other industrial activity be assessed, with the purpose of recommending improvements. The construction industry:

- a) Welcomes the study by the Economic Council of Canada of "economic regulation at all levels of government" commissioned by first ministers, and directs the Council's attention particularly to the benefits to be gained from greater harmonization among and within provinces with regard to construction related codes, standards, regulations and labour qualifications; from rationalization of the requirements to protect the natural and social environment; and from reduction in the paper burden;
- b) Recommends the inclusion of economic and social criteria in the assessment of codes and standards related to the construction industry at all levels of government, and the publishing of economic impact statements, detailing in a quantitative manner the costs (on the industry and its clients) and the anticipated benefits of each code or standard;
- c) Commends provincial governments for adopting the National Building Code or uniform building standards based on it, and urges them to expedite the implementation of the latest amendments to that code and adoption of other construction related codes and

standards, in order to improve the mobility of the construction industry;

- d) Urges upon the provincial governments the need for rationalization and streamlining of the large number of approvals in the land development process, which lead to long delays, restricted supply and high prices, in order to reduce significantly the costs which are now borne by residential, industrial and commercial clients;
- e) Supports the resource processing and similar industries in their concern that in applying environmental regulations full consideration be given to the cumulative effect of legislative requirements in all jurisdictions and by all agencies, and to the specific regional and corporate situation.

GOVERNMENT INCENTIVE PROGRAMS

A variety of incentive and assistance programs are provided by government to ensure continued sound industrial growth in Canada. These programs extend financial support for many types of endeavours, such as research and innovation, productivity enhancement, domestic promotion and export development, management advancement and adjustment assistance. Assistance under these programs may be in the form of cash grants, loan insurance or guarantee or the sharing of project costs.

Many of these support programs provide assistance for the manufacturing and processing sectors. Construction is not eligible independently for financial assistance under such major programs as The Enterprise Development Program (EDP) or The Regional Development Incentives Act (RDIA).

The Employment Tax Credit Program (Bill C-23), was designed primarily to deal with continuous types of employment, such as in manufacturing. Although the construction industry is eligible for assistance under this program, a contractor who has maintained his labour force during periods of low demand will not benefit financially to the same degree as the contractor who substantially reduced his work force during the same period.

The federal government, in establishing a Construction and Consulting Services Branch within the Department of Industry, Trade and Commerce, recognized the importance of construction activity to the overall economy. Similar recognition should be extended to the industry in the sphere of financial incentives and assistance.

Recommendation: That the federal and provincial governments review their industrial development policies and programs to establish their impact on construction and amend these, where necessary, to ensure that the programs encourage and facilitate the efficient development of the Canadian construction industry.

SECTOR PROFILE

THE CANADIAN CONSTRUCTION INDUSTRY

The following profile of the Canadian Construction Industry was developed by the Sector Task Force on the Canadian Construction Industry from a profile prepared by the federal Department of Industry, Trade and Commerce.

CONSTRUCTION INDUSTRY

INTRODUCTION

This paper focuses on the activities of firms and individuals engaged in the physical conduct of construction work — developer/builders, general contractors and trade contractors. Detailed consideration is not accorded the role of companies and institutions closely associated with and dependent upon construction activity in the context of architecture, engineering, project management, education, finance, equipment and materials supply, and inspection and testing. In the course of the paper, however, extensive reference is made to such organizations because of the strong linkages which connect them to the process of construction. The paper thus treats the contracting sector of the industry as an industry in its own right.

The construction industry is an important sector of Canada's economy in terms of employment, output and wages and as a consumer of manufactured goods. It also bears a basic relationship to all other industries accounting for some 25 to 30 per cent of capital investments in the manufacturing sector and approximately 60 per cent of all capital investment in Canada. The total value of construction activity in 1977 amounted to 34.3 billion and by reliable estimates this figure will exceed \$75 billion (in current dollars) annually by 1985).

Traditionally, Canadian construction firms, with few exceptions, have operated only in the domestic market. Over the past two or three years however, several firms have investigated opportunities offshore and some have won contracts. Industry interest in export activity is growing rapidly, but much basic understanding and promotional work is required if Canada is to achieve a reasonable share of the extensive overseas market for construction goods and services.

The construction process is becoming increasingly mechanized, organized and repetitive and now resembles the manufacturing sector to a considerable extent. In this context, the industry has the potential for improvements in productivity and efficiency which would result in considerable benefit to the national economy.

Considering the importance of the construction industry to Canada's economy, the changes that are taking place within the industry, as well as opportunities overseas, it is important that the industry grow and shape itself so as to maximize its contribution to the economy.

DEFINITION

Construction is defined by Statistics Canada as the creation, renovation, repair and demolition of immobile structures and the alteration of the natural topography.

The *Construction Industry* is composed of firms and labour primarily engaged in activities whereby construction is accomplished.

Construction Activity is the output of the construction industry together with the output of construction labour forces in other industries.

STRUCTURE

Size and Significance

The Canadian construction industry is large, diverse and complex. Construction activity accounts for about six per cent of Gross Domestic Product, compared to about four per cent for mining, three per cent for agriculture and 23 per cent for the entire manufacturing sector. The industry employs more than 700,000 workers, some seven per cent of the total Canadian labour force, and construction accounts for 60 per cent of the total investment in fixed assets in the economy.

Industry Segments

The industry in the context of this profile, consists of two major sectors, building construction and engineering construction, each of which is subdivided into several segments. In 1976, the value of work performed by each of these segments was as follows:

Classification of Value of Construction — 1976
(New and Repair)

	\$ billion	% of total
<i>Building Construction</i>		
Residential	11.6	33.4*
Industrial	1.4	4.6
Commercial	3.3	10.5
Institutional	1.5	4.7
Other building	1.2	3.7
Total	19.0	59.9
<i>Engineering Construction</i>		
Marine	0.2	0.5
Roads and highways	2.6	8.2
Water works	1.3	4.1
Dams and irrigation	0.1	0.4
Electrical power	3.1	9.8
Railway, telephone and telegraph	1.2	3.8
Gas and oil	2.3	7.3
Other engineering	1.9	6.0
Total	12.7	40.1
Total Construction	31.7	100.0

*Residential construction has consistently equalled or exceeded 30 per cent of the total value of construction in recent years.

Source: Statistics Canada — "Construction in Canada".

Scale, Size and Type of Companies

The construction contracting industry consists of about 100,000 firms, of which 30,000 are incorporated. Most are small, having sales of less than \$2 million and fewer than 50 employees. There are, however, a few large companies. Only the largest of these have significant public share holdings. Table 1 of the Appendix shows the distribution of incorporated construction firms by size and type for 1973. A comparison of assets and sales of firms can be misleading since some firms make a practice of leasing equipment while others purchase it outright. Of the 30,000 incorporated firms only one per cent have assets greater than \$5 million, yet these firms are responsible for about 23 per cent of the business.

About 200 firms are foreign controlled — 60 per cent of which are owned by American interests. Some 60 of these foreign controlled firms have relatively large assets (in excess of \$5 million). It is estimated that about 10 per cent of construction work in Canada is carried out by foreign controlled firms.

Subsectors of the Construction Industry

<i>Subsector Description</i>	<i>1974 number of incorporated firms</i>	<i>1974 total revenue \$000,000</i>
BUILDING		
<i>Residential</i>		
Builder/developers	2595	2525.7
General contractors	4498	390.8
Subtotal	7093	2916.5
<i>Non-residential</i>		
General contractors	3589	3539.2
Special trade contractors	15885	6119.5
Subtotal	19474	9658.7
ENGINEERING		
Highway, road, street and bridge	1250	1816.6
Other engineering contractors	1961	2669.9
Subtotal	3211	4486.5
Total	29,778	17,061.7

Source: Statistics Canada Publications 61-207, 64-204-208 and Estimates by the Construction and Consulting Services Branch.

The above table indicates that 36.5 per cent of the residential contractors perform 86 per cent of the residential building work. This 36.5 per cent is mainly developer and builder/developer firms with sales in excess of \$500,000.

In the non-residential building segment of the construction industry there are two main groups: general contractors which account for 18.3 per cent of the firms and 36.5 per cent of the work; and special trade contractors which represent 81.7 per cent of the firms and 63.5 per cent of the work.

The engineering sector includes 10.8 per cent of the corporations in construction performing 26 per cent of the corporate work. The number of firms in the engineering sector has remained relatively unchanged over the years although the total amount of work has been increasing in absolute terms and as a percentage of the total construction volume.

Regional Distribution

Regional shares of construction spending reflect population, industry mix, development of natural resources and the rate of regional development. Except for large or specialized projects, construction in Canada is carried out by local firms. The following table shows that while the value of construction

Regional Shares of Construction Spending (billion dollars)

	<i>Average 1951-70</i>	<i>1970</i>	<i>%</i>	<i>1973</i>	<i>%</i>	<i>1976</i>	<i>%</i>
Atlantic Region	8%	\$ 1.3	9.3	\$ 2.2	8.8	\$ 2.6	8.2
Québec	24%	2.8	20.2	5.6	22.7	7.4	23.7
Ontario	34%	5.0	36.2	8.5	34.4	9.8	31.2
Prairies	22%	2.9	20.9	4.8	19.5	7.3	23.3
British Columbia	12%	1.8	13.4	3.6	14.6	4.3	13.6
Canada	100%	\$13.8	100.0	\$24.7	100.0	\$31.4	100.0

Source: Statistics Canada.

expenditures has increased significantly in the 1970's, there has been no significant shift in spending from one region to another over the past 25 years.

In recent years, a substantial part of the total construction expenditure took place in the large metropolitan areas, especially Montreal and Toronto, reflecting the rapid urbanization of Canada.

Construction Linkages with the Economy

The construction industry makes an important direct contribution to Canada's economy and is an important purchaser of materials and services of other sectors.

For each \$100 of output, the construction industry spends approximately \$39 on materials, \$36 for labour, \$14 on the purchase of services, and \$11 on taxes and capital. In other words, for each \$1 of labour costs, \$1.08 is spent on materials, primarily from the manufacturing sector. Table 2 in the Appendix shows the comparison of the figures for construction with those for other sectors of the economy. Construction purchases have their greatest impact on iron, steel and fabricated metal products; lumber and wood products; non-ferrous metal products; cement and concrete products; and other non-metallic mineral products such as clay brick, asbestos products, etc. Quebec and Ontario supply most of their provincial construction material requirements and also a large proportion of the needs of the other regions.

The construction industry's expenditures in the various sectors are:

The Canadian Market for Construction in 1976

	Value of Construction (\$ million)			% of Total Market
	Building	Engineering	Total	
Agriculture and fishing	501	270	771	2.5
Forestry	17	115	132	0.4
Mining, quarrying and oil wells	359	2,679	3,038	9.7
Construction	102	1	103	0.3
Manufacturing	1,060	919	1,979	6.3
Utilities	626	4,819	5,445	17.4
Trade-wholesale and retail	404	19	423	1.3
Finance, insurance and real estate	1,444	136	1,580	5.0
Commercial services	562	9	571	1.8
Housing	10,425	—	10,425	33.1
Institutional services	1,386	13	1,399	4.4
Government departments	1,149	4,434	5,583	17.8
	18,035	13,414	31,449	100.0

Source: Statistics Canada.

Construction Costs

Since construction accounts for 25 per cent to 30 per cent of the manufacturing industry's capital investment expenditures, construction costs affect significantly the manufacturing sector's ability to expand and to compete in domestic and world markets. Construction costs, moreover, have an influence on the selection of sites for industrial development in a regional context. As shown in the table below, regional construction costs for a standard industrial/commercial building, exclusive of land, vary as much as 20 per cent in urban areas across Canada. Land costs can vary a great deal more. Also, regional construction costs vary widely for more complex projects, depending on the local availability of technology, services, equipment, materials and labour.

When comparing the cost of constructing standard industrial buildings in Canadian urban centres with the cost of constructing a similar building in major urban centres of the U.S. the following pattern emerges. The cities located in the northern U.S., or heavily developed areas such as Los Angeles, likely have construction costs comparable with or slightly higher than those prevailing in most Canadian metropolitan centres. In some major southern U.S. urban areas this cost differential is favourable to the United States. Costs in the southern U.S. are lower for several reasons. Labour is plentiful and lower priced than in Canada. Favourable climatic conditions do not impede the construction process and foundation and insulation requirements are less stringent than in Canada. The industry argues as well

that government approval procedures for development in Canada of serviced land are more complex, contributing to total cost differentials between the two countries.

For general comparison purposes the following indexes have been developed for a standard two storey, steel frame, masonry wall, industrial building of 40,000 square feet; land costs are not included. This type of building would cost about \$1 million in Toronto. Figures are for *June 1977*, completed in terms of Canadian dollars.

Indexes of Construction Costs*
Standard Industrial Building

CANADA				UNITED STATES			
Toronto	100.0	Winnipeg	106.4	Raleigh N.C.	73.1	Denver	106.5
Windsor	102.3	Saint John	106.7	Houston	90.1	Seattle	112.4
Halifax	102.8	Sudbury	109.1	Miami	98.3	Los Angeles	112.4
Montreal	103.5	Regina	110.5	Chicago	104.2	Detroit	114.8
Ottawa	104.0	Vancouver	110.9	Kansas City	105.2	New York	118.3
Quebec	104.5	Thunder Bay	116.0				
Calgary	106.1	St. John's	117.0				

*Does not include the cost of land.

Only the labour related (up to about one third of total project cost, excluding land) and management costs are within the direct control of the construction industry. The contractor is basically concerned with the erection/installation of building components or equipment, all of which have prices defined outside the construction industry.

The following table shows regional cost differences for some basic building materials.

Unit Cost of Some Basic Building Materials Canada/U.S. Spring 1977
(Canadian dollars)
3/4"

	4000 psi. Concrete Cu. yd.	8" std. Concrete Block	Formwork Plywood Sq. ft.	Fabricated Structural Steel/ton	Cut/bent Reint. Bar/ton	Vinyl Tile Sq. ft.
CANADA*						
Halifax	33.00	0.56	0.66	520	350	0.49
Montreal	34.78	0.44	0.63	540	360	0.42
Toronto	29.50	0.48	0.60	520	370	0.44
Vancouver	33.38	0.64	0.54	605	375	0.56
U.S.						
New York	31.20	0.45	0.55	685	462	0.53
Raleigh	31.40	0.45	0.53	503	361	0.55
Chicago	29.10	0.49	0.54	543	364	0.52
Houston	29.00	0.45	0.47	523	357	0.63
Denver	33.10	0.50	0.54	590	351	0.65
Los Angeles	30.00	0.45	0.50	552	288	0.56

*Five per cent federal tax included in Canadian material prices.

In general concrete and cement products are somewhat less expensive in the U.S. than in Canada. Prices for fabricated steel are slightly lower in Canada. Plywood is less costly in the U.S. No comprehensive figures are available but in general, building materials, equipment and accessories are considered by the construction industry to be less expensive in the U.S. than in Canada. There is no federal sales tax in the U.S. Canadian federal sales tax is an element in placing the Canadian purchasers of buildings and structures at a competitive disadvantage with those in the U.S.

In overseas areas where construction markets are undergoing rapid development, e.g. the Middle East, materials and equipment from Canada often are not competitive with those from Europe and Japan. Transportation, handling and distribution costs are in general higher in Canada than those

prevailing in countries with which Canada must compete. To the extent that Canadian contractors would be inclined to use Canadian products and services abroad, such costs adversely affect international competitiveness.

The relatively high material and equipment prices in Canada not only boost domestic construction costs but make it difficult for Canadian contractors to be competitive in overseas work, particularly when they have to meet certain Canadian content requirements to receive government financing, insurance and other incentives.

An example of regional cost difference has been documented in the discussion paper prepared by the Chemicals Branch of Industry, Trade and Commerce. This paper gives the following typical capital cost indexes for petrochemical plants in three areas of Canada compared to the U.S. Gulf Coast.

Causes of Net Percentage Increase
(Based on 1975 Data)

U.S. Gulf Coast	1.00	<u>Labour</u>	<u>Material</u>	<u>Engineering</u>
Sarnia	1.20	14	4	2
Montreal	1.30	23	5	2
Calgary	1.35	26	5	4

Although labour-related costs represent only about one-third of the cost of new plants of this type, they account for some two-thirds of Canadian cost disadvantage.

High basic construction labour rates along with the higher costs associated with climatic conditions are the prime causes of higher Canadian costs compared to those of the largely non-unionized and climatically more temperate southern U.S. However, in comparison with other areas of the United States, cost differences are less marked.

Hourly rates paid to Canadian construction workers currently run 30 per cent to 45 per cent higher than in manufacturing. When the associated costs are passed on to the manufacturing sector, they add to its cost structure. In 1951 construction workers and workers in manufacturing earned virtually the same average hourly wage, \$1.19 in construction and \$1.18 in manufacturing. The following table indicates that by 1975, the average hourly construction wage was \$7.50 compared with \$5.06 in manufacturing, a 530 per cent increase for construction compared with 329 per cent for manufacturing. However, in comparing hourly wage rates in construction and manufacturing, account must be taken of such factors as job insecurity due to seasonality, uneven work schedules, and fluctuations in construction which reduce the annual income of the construction worker. Construction tradesmen average only 1,200 to 1,400 hours of work per year depending on the degree of construction activity for that year.

Hours and Earnings

	<u>Average Weekly Hours</u>		<u>Average Hourly Earnings</u>	
	1970	1975	1970	1975
	<i>(hours)</i>		<i>(dollars per hour)</i>	
Mining	41.0	40.0	\$3.71	\$6.51
Manufacturing — total	39.7	38.6	3.01	5.06
Non-Durable	39.3	38.0	2.77	4.68
Durable	40.2	39.1	3.25	5.41
Construction — Total	39.2	39.1	4.21	7.50
Building	37.5	37.4	4.36	7.68
Engineering	43.1	42.1	3.92	7.25

¹Earnings include wage, bonuses and incentives.

Source: Statistics Canada

The wage increases gained by construction unions have tended to lead industry as a whole thus providing precedents for unions representing other industries.

As may be seen from a chart of wage and input price indexes (figure 1, Appendix), construction hourly wage rates have increased by 167 per cent from 1965 to 1975, materials prices have risen 75 per cent while machinery and equipment prices have gone up 80 per cent.

The following table shows growth in average Canadian construction wage rates compared with the average U.S. construction wage rates for the period 1971 to 1976. While average U.S. construction

wage rates exceeded those of Canada by some 16.5 per cent in 1971, Canadian average rates in 1976 exceeded those of the U.S. by 13 per cent.

Canada/U.S. Construction Average Basic Wage Rates/Hour

	1971	1972	1973	1974	1975	1976
Canada	4.75	5.15	5.68	6.43	7.51	8.68
U.S.	5.69	6.03	6.37	6.75	7.25	7.68

Source: U.S. Survey on Business; Statistics Canada Publications.

The composite labour and material price index for Canada and the U.S. for a similar period shows a higher rate of growth in Canada than the U.S.

A number of other elements contribute to the costs of putting construction projects in place. The level of fragmentation in dealings between government and industry has impaired communications and damaged the efficiency of collective bargaining leading to lost time and opportunities, as well as unnecessarily generous contract settlements. Government influence in the areas of codes, standards and the many levels for project approval has led to increased costs through delays and duplication. As well, inefficient management techniques lead to waste and added costs.

Employment and Labour Supply

Of approximately 700,000 construction workers in 1975, between 450,000 and 500,000 constituted a regular body of tradesmen and labourers employed in construction with the remainder entering and leaving the industry in response to cyclical and seasonal conditions. Much of the manpower response to these conditions comes from a "supplementary" construction labour force — students, workers from other industries and unemployed tradesmen. The table below gives the construction labour force as a percentage of Canada's labour force by region.

Employment — 1975
(thousands of persons)

	Construction labour force	Total labour force	Construction as percentage of labour force
Atlantic region	75	710	10.6
Quebec	163	2,462	6.6
Ontario	242	3,581	6.8
Prairies	138	1,528	9.0
British Columbia	88	1,027	8.6
Canada	706	9,308	7.6

Source: Statistics Canada — Construction in Canada; Canadian Statistical Review.

The construction industry has traditionally relied heavily on immigrants for its skilled workers. Tightening of immigration rules and regulations result in such tradesmen not being so readily available as in the past. Trades training programs in Canada are not adequately filling the gap.

The regional nature of construction requires that labour be especially mobile. Many construction workers will not willingly relocate elsewhere in Canada unless induced by financial incentives and employment benefits.

MAJOR ISSUES SPECIFIC TO THE CONSTRUCTION INDUSTRY

Fragmentation

There are some 200 associations of a trade and/or professional nature concerned with construction in Canada at national, provincial and municipal levels. The difference in perception of

industry problems and issues in and amongst these groups inevitably results in a lack of uniformity in industry's approaches to governments. Each of the associations and groups has, however, a viable "raison d'être" and this mitigates against reduction of such fragmentation in the foreseeable future.

On a more positive side, several of the strong national associations have reasonably uniform perceptions of constraints to the industry's effectiveness. The Canadian Construction Association, the Housing & Urban Development Association of Canada, the Association of Consulting Engineers of Canada, the Royal Architectural Institute of Canada, Construction Specifications Canada and other associations representing the major sub-contractors, have in recent years substantially increased their capability for addressing governments on matters of broad interest and concern to the industry.

The industry is very competitive and firms are exposed to a variety of risks not common in the manufacturing sector. This high risk situation has led to considerable individualism amongst firms. There is as well, a traditional discontinuity in relationships between purchasers, labour, contractors and sub-contractors. The result is a highly fragmented industry. More permanent relationships between general and trade contractors and other major groups within the industry — manufacturers, builders, suppliers, etc., even on a regional basis, would reduce but not eliminate fragmentation. Demand for the products and services of the industry is unstable and cyclical as well. Fragmentation also exists in the multiplicity of government departments, agencies and groups having interest in construction.

Governments

All levels of government exert considerable influence, directly and indirectly, on the construction industry. Direct government expenditures on construction account for about one-third of total construction activity. Indirect government involvement significantly influences a further 20 per cent or more of construction in Canada. According to an Economic Council of Canada study, "Toward More Stable Growth in Construction", government expenditures account for about one-third of all construction instability. What stands out, according to the ECC, is that in no region did government spending on construction run counter to the construction cycle over the period considered in its study. Changes in government monetary and fiscal policies also have caused appreciable changes in demand for construction.

Governments also have a direct influence on the level and standard of construction performance through the administration of planning and building regulations, labour codes and other legislation. In some ways this influence benefits the construction process, e.g. through standardization, human welfare and safety, quality control and fair competition. In other ways, efficiency is impeded by lengthy process required for approvals, particularly in land development, and in the slow acceptance of innovative construction products or processes not covered by published regulations.

The industry believes that certain government incentive programs should be expanded to include the construction industry. In this regard, better, cleaner access for the Enterprise Development Program of the Department of Industry, Trade and Commerce and to Export Development Corporation Assistance, are viewed by industry as being desirable and potentially of high benefit. A chief complaint is the length of time between application and decision on government programs of incentive and assistance, which can be especially critical to an industry which lives with urgent tender-call situations.

MAJOR ISSUES HAVING CROSS SECTORAL SIGNIFICANCE

Cyclical and Seasonal Activity

The industry is subject to irregular fluctuations in output, employment and profitability, caused mainly by the wide swings in demand for new construction.

Swings in construction expenditures are considerably more pronounced than those of the economy as a whole. (Figure 2, Appendix).

However, the use of national figures in these illustrations tends to understate the severity of the situation since most construction firms are dependent on regional markets that may be subject to much greater cyclical changes than those of the nation as a whole. Construction instability has been considerably above the national average in British Columbia and Quebec, near average in the Prairies and below average in the Atlantic region.

The cyclical of construction activity is illustrated by the following table:

Value of Construction Activity

Year	Current \$ billions	% change from previous year	Constant (1971) \$ billions	% change over previous year
1966	11.24	13.2	13.89	6.5
1967	11.62	3.4	13.81	-0.6
1968	12.21	5.1	14.32	3.7
1969	13.21	8.1	14.66	2.3
1970	13.78	4.3	14.61	-0.4
1971	15.86	15.1	15.86	8.6
1972	17.29	9.0	16.37	3.2
1973	20.17	16.7	17.38	6.2
1974	24.69	22.4	18.02	3.7
1975	28.13	14.9	18.19	1.0
1976	31.77	12.0	18.40	1.2
1977 est.	34.35	8.1		

Source: Statistics Canada — "Construction in Canada"

Very large projects such as the Trans Canada Pipeline, the St. Lawrence Seaway and those associated with intensive resource development of the 1950s and 1960s were especially significant in their effect on instability in construction.

Cyclical instability adds immeasurably to the strains between management and labour and distorts the balance necessary for reasonable wage negotiations. This, together with fluctuations in the prices of materials, compounded by the tendency for prices not to fall in periods of downturn, results in inflationary construction costs. Prices for construction (including housing) are subject to a "ratchet effect", because each period of ascending demand places an upward pressure on wages and the costs of other building inputs (materials, equipment, land, etc.) but downturns in activity do not generally result in offsetting price reductions.

The Economic Council of Canada has stated that "... construction investment ... for several decades, has contributed more to instability of the (Canadian) economy than all other investment sectors combined."

The Council has also indicated that, because of the interdependence of various sectors of the economy, demand instability tends to be multiplied as it passes through the construction industry to the manufacturing and other sectors.

Seasonal factors, especially the severe Canadian winters, cause strong fluctuations in construction activity. Despite recent advances in winter construction techniques, the seasonal unemployment rate regularly reaches 25 per cent in construction (175,000 workers), 3 to 4 times as high as the average in all other industries. (See figure 3 Appendix).

Industrial Relations

The labour component of the industry, with the exception of the residential and certain engineering construction segments, is characterized by strong national and international labour unions which have made significant advances on behalf of their members. Labour gains have been in the direction of improved wages and benefits and have resulted in better working conditions. Moreover, union membership in construction continues to expand, presumably because of effective certification work and negotiation gains in the collective bargaining process. (Apart from Quebec, where union membership is compulsory, employment in commercial, institutional and industrial building construction elsewhere in Canada is 60 to 80 per cent unionized; road and bridge construction is 40 to 45 per cent and residential construction is 15 to 20 per cent.)

With respect to the time lost in industrial disputes over the period 1967-1975, Canada has the worst record among 19 industrial countries surveyed by the Organization for Economic Cooperation and Development (OECD). Canada's construction industry, with approximately six to seven per cent of the labour force, has been responsible for as much as 33 per cent of the total man-days lost by all industries in a given year (1970). In the 1971-76 period, however, man-days lost attributable to industrial disputes in construction averaged 15.6 per cent of all work-stoppages.

Industrial relations in the construction industry are more complex than in other industries due to the presence of some 15 independent craft unions and a multiplicity of employer bargaining groups. While steps have been taken in most provinces to reduce the number of bargaining situations through amalgamation of bargaining units, a major divergence of views, between labour and management, exists concerning appropriate structures for collective bargaining. Craft unions predominantly uphold the principle for single trade bargaining whether it be at the local, regional, provincial or national level. The unions contend that it is essential for the management association with whom they deal to be limited to employers who employ members of their union and who have a bargaining obligation or commitment to the union. They feel further that the management association dealing with their union should be required to retain its bargaining rights and not be able to surrender them or have them taken away.

On the other hand, construction management generally believes that bargaining with the various craft unions, within a sector of the construction industry, must be fully co-ordinated by a designated agency or should take place on a multi-trade basis with all crafts and all specialist contractors particularly under the umbrella of one employer bargaining agency which would assume all employer bargaining rights.

Until such time as a mutually acceptable improvement in the bargaining structure is implemented, industrial relations in Canada's construction industry will remain strained.

Construction Management

Construction managers tend to be defined as "self made men", many having come up through the industry as tradesmen and supervisors to the management level. They usually exhibit a good knowledge of most of the construction skills having received considerable on-site training and experience. However, other management skills (financial management, marketing and labour relations) frequently are lacking among such managers. Some attempts are being made to overcome these deficiencies through seminars and short courses at universities and community colleges in co-operation with industry associations and government.

The integration of construction companies with design firms, manufacturers and financial institutions, to develop and operate the consortia or joint ventures necessary to handle large projects, both in Canada and abroad, will require a large number of managers with modern management skills. The industry's ability to increase productivity and meet the challenges of domestic and export demands would appear to require a considerable improvement in the effectiveness of construction management education and training.

A 1973 study by Urwick Currie and Partners Ltd. entitled "Construction Industry Management Needs", undertaken at the request of the Construction Industry Development Council*, concluded that:

1. "Much of the required education resource already is available but is improperly focussed to meet the industry's needs.
2. "No appropriate vehicle exists to stimulate the communication necessary to solve this problem or to initiate and co-ordinate the supportive activities required to improve management effectiveness through education.
3. "Industry members, educators and representatives of provincial Departments of Education support the creation of a Construction Education Institute for this purpose."

A Construction Education Institute recommended in the study has not been established but remains an active consideration.

International Trade

The Canadian construction industry has considerable expertise that could be applied in international markets, particularly in specialized fields. These include industrial plant construction, communication systems, power generation, housing and certain types of engineering construction. Although the industry traditionally has been domestically oriented and is limited to some extent by the nature of its operations, there appears to be significant opportunity for the export of Canadian construction expertise, along with Canadian materials, prefabricated structures and components.

No accurate statistics are available on construction exports from Canada. It is estimated that in 1976 about \$600 million of overseas construction contracts were carried out by Canadian firms (about 2 per cent of domestic activity). Of this amount, about \$400 million was Canadian content, largely in the

**The CIDC, consisting of some 30 individuals from firms, labour and government, is an advisory body to the Minister of Industry, Trade and Commerce on matters concerning the construction industry.*

form of prefabricated structures. A reasonable estimate of potential for overseas contracts would be 5 per cent of domestic activity by 1980, i.e. \$2.5 billion.

Canadian contractors, by carrying out construction projects in foreign countries, can create a "human" Canadian presence that cannot be achieved through the export of products alone. This presence, reinforced through the establishment of Canadian construction offices and technical advisers overseas, can lead to a greater recognition and appreciation of Canadian expertise by foreign clients, resulting in more receptive markets for other Canadian goods and services.

Several countries have asked Canada to second various Canadian experts into their civil services with the foreign country concerned paying all costs in advance. The Americans are heavily involved in this type of scheme, both financially and commercially, particularly in the Middle East. At the present time no mechanism exists within the Canadian government to implement such a secondment program; CIDA for example, does not handle cost-reimbursable programs.

Market opportunities abroad for Canadian construction goods and services lie less with our traditional trading partners, e.g. Europe, U.S., and Japan, than with developing countries, where there is relatively little Canadian government presence. In some of these areas Canada is not represented directly through trade posts (Arabian Gulf, Ecuador, Panama, etc.). Industry contends that, in other countries, there is insufficient staff to service industry's needs (e.g. Saudi Arabia, Nigeria, Algeria).

The governments of the U.S., U.K., France, Germany, Korea and Japan have developed effective means to secure foreign work for their construction industries. The U.S. Corps of Engineers, for example, will design and manage about \$20 billion of construction in Saudi Arabia over the next five years. The Joint Economic Commission U.S.A./Saudi Arabia (JACORE) has 100 advisers (paid for by the Saudis) working within the Saudi civil service, developing policies, standards and designs mutually acceptable to both countries.

The combined five-year plans for Saudi Arabia, Iran and Iraq call for an estimated \$130 billion of construction. Most of this work is beyond the capability of construction industries of these foreign countries. Canadian firms as independent units, or in co-operation with foreign companies well established in the market area, could provide a portion of the construction services and materials required. Recently some significant overseas work has been secured by Canadian firms, notably in the supply of factory built housing and schools, however more participation by our general contractors could be realized. As the massive demand in the Middle East is being satisfied, other opportunities are fast developing in Africa, Latin America and South East Asia.

The multilateral trade negotiations now taking place under the auspices of the General Agreement on Tariffs and Trade are not directly concerned with construction services but rather with international movement of goods. Tariff reductions as a result of the GATT negotiations are unlikely to have a significant impact on the Canadian construction industry.

Domestic Opportunities

On the domestic scene, many developers of major projects, especially of multinational corporations beneficially owned outside of Canada, have awarded contracts for design, construction and project management to foreign-controlled companies without invitation to Canadian controlled firms.

The impact of this reliance on non-Canadian design, procurement and construction is widespread. These imports represent a distinct and growing portion of Canada's current account deficit. Canadian firms, particularly foreign-controlled subsidiaries, purchase a large and increasing volume of business services from abroad. To the extent that these imports inhibit development of comparable domestic services, they cause an under-utilization of Canadian managerial and professional business talents. These purchases represent employment opportunities which are transferred to other countries and limit the growth of Canadian firms. It is estimated that some \$500 million of business services, of which about \$200 million are for engineering designs, are imported annually. This represents about 20,000 lost jobs, 7,000 of which could be classified as highly-skilled. Through the economic-multiplier mechanisms, this \$500 million in reality means much more to Canada and what is worse, these purchases have been increasing at an average annual rate of between 15-20 per cent over the last 10 years.

Capital Requirements

Demand for the output of the construction industry is influenced by the availability of funds and the cost of money. Most contracts are carried out on a fixed price basis with payments to the contractor apportioned according to the progress on the project. Labour and materials invoices frequently come

due on shorter cycles than progress payments. Thus, the industry requires sufficient operating capital, which often is difficult to obtain, to cope with this interim financing problem.

The construction industry itself invests less capital per worker than other industries; from 1970 to 1975 for example, its capital assets in machinery and equipment were about half the level of the average for other industries, in part due to a high degree of leasing.

Leasing and renting of equipment provides the contractor with operational flexibility as well as reducing his overhead costs. On the other hand, certain subsectors of the industry, such as highway, road, street and bridge builders, often purchase the necessary machinery and equipment, thus placing a heavy financial burden on the contractor.

Unlike the manufacturing industry, the construction industry does not generate much of its own capital from its shareholders or from its retained earnings. The bulk of its capital is borrowed money. Even the speculative building of apartments, houses, office buildings and light industrial buildings is financed with mortgage loans usually obtained from financial institutions in advance.

The operating financial requirements for construction companies are more onerous than for manufacturing firms since contractors are required to carry more extensive fire, theft and equipment insurance, in addition to special risk coverage for public liability. Specialized bonding companies have been established to provide the industry with additional risk coverage in the form of bid bonds, labour and material and performance bonds. The needs in these areas of insurance and bonding are particularly burdensome for some small firms.

Energy Conservation

The need to conserve energy is providing a challenge for engineers and architects to design more energy-efficient structures and for mechanical and electrical contractors in the installation of new or improved systems. There is, however, little that can be done to reduce energy use during the construction process. To date, little concern, relative to overall construction activity, has been shown by Canadian industry in general to bring about fuel savings in the construction and operation of buildings. The inducement will need to come from the buyers of construction.

Governments have a role to play by promoting energy conservation through example and by encouraging others to conserve through practical regulations. Governments also can help to ensure that adequate technology is available, through research and through dissemination of existing information on energy saving systems and techniques.

Research and Development

Documented research and development expenditures for construction and building materials firms were estimated to be \$40 million in 1975. This amounted to 0.16 per cent of the value of construction work carried out, compared with all scientific R & D which amounted to 1.1 per cent of the Gross National Expenditure. Governments and manufacturers of construction materials contribute to the bulk of this research.

Comparatively little use is made of government incentive programs by the construction industry, since these programs are geared to the operations of manufacturing products rather than to the physical construction process.

Another important point is that the nature of the work of the construction industry influences the ways in which conception, design, supply and construction are carried out. In a manufacturing industry it is fairly common for the initiation of the enterprise, the design and development of the product, the design of the production facilities, and the subsequent operation to be carried out within the sphere of company operations, that is, largely under central control. The opposite is general practice in construction: the enterprise, design, supply and erection of construction are usually carried out by separate agencies whose co-ordination and control have to be arranged specially for each particular job, usually through their respective contractual arrangements. The implications for communications, knowledge transfer, and research can be markedly different in degree, if not in kind, between these two kinds of industries.

Despite the apparent lack of formal research and development by contractors, much is being done on the jobsite in an evolutionary rather than a revolutionary sense. Canadian contractors are quick to develop new methods and techniques that will enable them to complete their work more economically. In most fields, the technical competence and performance of major Canadian contractors is comparable with or better than that of international competitors.

The Science Council of Canada has indicated that there is concern within the industry that more effective communication links are required between R & D laboratories and the application of the

results in the field. Similarly, contractors in particular could bring their needs to the attention of the laboratories more quickly.

PERFORMANCE

Prior to 1970 output per worker in the labour-intensive construction industry paralleled manufacturing. Since that time, construction does not compare favourably, particularly during the recent period of economic slowdown. (See Fig. 4).

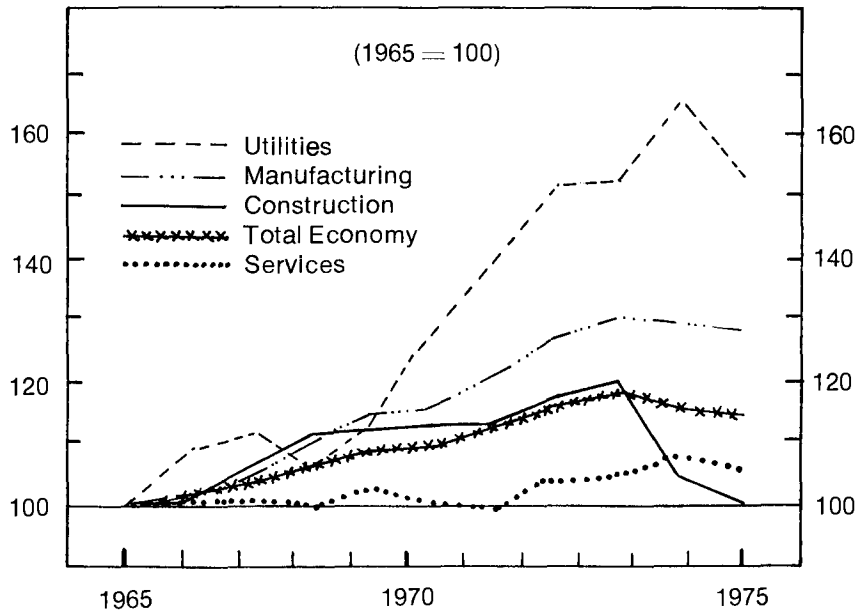
The increase in equipment per worker in most industries may be regarded as the major cause of an increase in output per person employed. The capital stock per employee in construction, as shown in Fig. 5, has not been growing at the same rate as other industries. However, the true rate of growth of equipment per employee is greater than that indicated since equipment leasing, which cannot be adequately measured, has expanded considerably in the construction industry over the last 10-15 years.

Productivity is one determination of unit labour costs. In turn, unit labour costs are of fundamental importance in determining the ability of Canadian industry to continue to compete for its share of the construction market for production and manufacturing facilities.

From 1951 to 1971 unit labour costs in construction rose an average of 2.9 per cent a year as compared with 4 per cent for the manufacturing sector and 3.2 per cent for the economy as a whole. In more recent years, i.e. from 1970 to 1975, as shown in Fig. 6, unit labour costs increased at 12.5 per cent a year in construction as compared with 8.7 per cent in manufacturing.

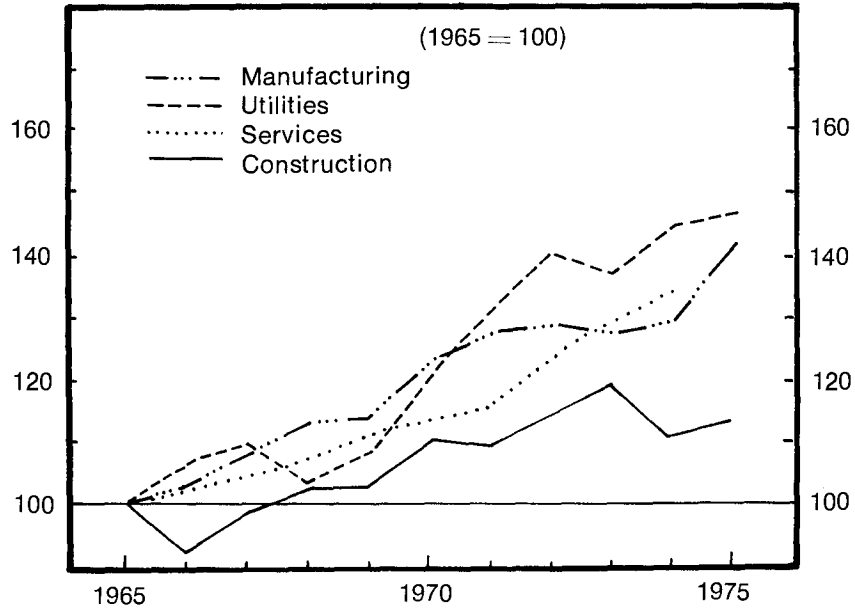
INDEXES OF OUTPUT PER PERSON EMPLOYED — SELECTED INDUSTRIES

(Real Domestic Product per Employed Person)



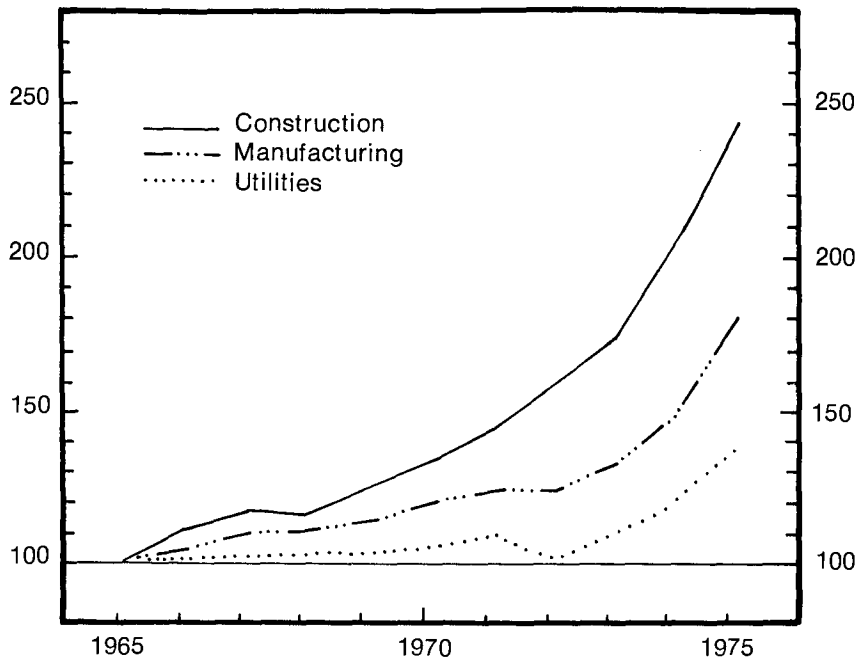
Source: Based on Informetrica Ltd. data

CAPITAL STOCK PER EMPLOYEE — SELECTED INDUSTRIES



Source: Based on Informetrica Ltd. data

UNIT LABOUR COSTS — SELECTED INDUSTRIES



Source: Based on Informetrica Ltd. data

Profitability

When compared with other sectors of the economy, the construction industry does not show any significant difference in terms of profit performance. Profits and return on equity compare well with other sectors as shown in the following table.

	<i>Net Profits / Corporation</i>	<i>Net Profits Total Revenue</i>	<i>Before tax return on Equity</i>	<i>After tax return on Equity</i>
Construction	\$ 15,800	3.1%	19.3%	12.4%
Manufacturing	\$205,100	6.8%	17.5%	10.6%
Forestry	\$ 26,200	6.5%	21.8%	12.9%
Mining	\$362,100	18.1%	12.4%	10.8%

Profits have varied over the past 20 years both in absolute terms and as a percentage of sales, as indicated in the following table.

<i>Year</i>	<i>Number of Corporations</i>	<i>Net Profits \$ millions Before Tax</i>	<i>Net Profits as % of Sales</i>
1953	3,459	94	5.4
1954	4,263	84	4.1
1955	5,307	72	3.1
1956	6,502	97	3.2
1957	7,521	124	3.4
1958	8,703	160	4.2
1959	10,197	134	3.3
1960	11,171	78	1.8
1961	11,811	91	2.1
1962	12,716	71	1.6
1963	12,710	62	1.3
1964	13,844	181	1.6
1965	15,315	190	3.4
1966	14,846	269	3.8
1967	16,183	302	4.0
1968	17,694	277	3.6
1969	19,203	274	3.5
1970	19,974	219	2.5
1971	21,293	351	3.6
1972	22,997	375	3.4
1973	26,539	514	4.0
1974	29,778	733	4.4

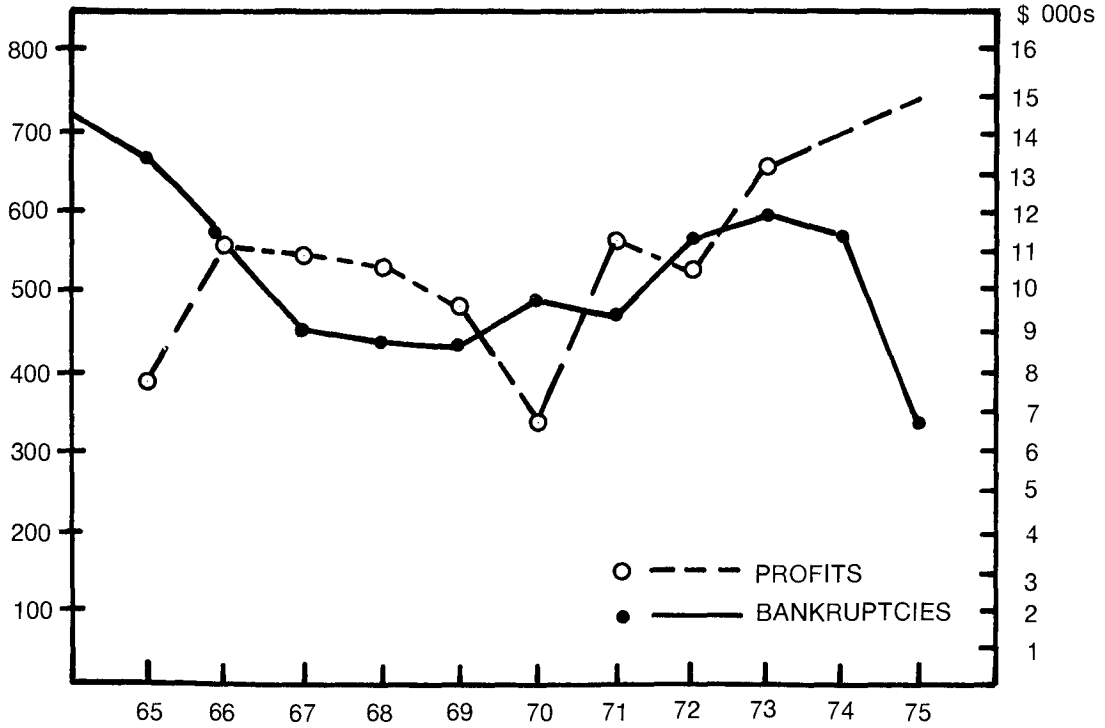
Source: Statistics Canada.

Fig. 7 shows the relationship between profits and bankruptcies. When construction demand levels out and falls, excess capacity develops which puts a strain on profits, and short-term debt ratios decrease resulting in higher bankruptcy rates and business closures. Several lags are inherent in the cycle.

**BANKRUPTCIES TO PROFIT COMPARISON FOR
CONSTRUCTION CORPORATIONS**

NUMBER OF
ANNUAL
FAILURES

AVERAGE
AFTER TAX
PROFITS



OUTLOOK FOR THE CONSTRUCTION INDUSTRY

It has been estimated that Canada will double its present stock of buildings in the next 25 years. The demand for construction in most developing nations will be even more impressive than in Canada. This provides an unparalleled challenge and opportunity for the construction industry both in Canada and abroad, and emphasizes the need for improved productivity and efficiency in the industry.

In the next two to five years however, the building construction subsector of the industry will be faced with a greater than usual uncertainty of domestic demand. The demand for schools, hospitals and related structures will likely continue to be restrained. An excess of stock of certain commercial and residential buildings exists across Canada. Also, the construction and manufacturing facilities, an area that showed considerable promise for construction during 1970-76, remains a depressed market for the industry.

The overall outlook for construction to 1985, prepared by the Canadian Construction Association, using Informetrica data, is shown in the following table.

Construction Outlook 1977-1985
(millions of current dollars)

Source of Work	Intentions 1977	Forecast			
		1978	1979	1980	1981-85
New Construction					
Industrial	10,250	10,500	12,350 ²	16,100	23,725
Commercial (private)	2,175	2,525	2,975	3,525	4,650
Institutional and government	6,175	6,650	7,575	8,225	10,675
Miscellaneous-non-residential	750	825	850	1,000	1,350
Housing	9,250	8,900	9,350	10,400	12,525
Total New Construction	28,600	29,400	33,100	39,250	52,925
Repair Construction	5,200	5,700	6,325	7,000	9,175
Valuation adjustment ¹	550	725	825	950	1,300
Total Construction	34,350	35,825	40,250	47,200	63,400
Percentage Change, Current \$	8.1	4.3	12.4	17.3	10.3

¹ Represents reconciliation to Private and Public Investment data from National Accounts data.

² Construction of a major natural gas pipeline is assumed to start in 1979 and be largely completed in 1982.

Construction volume in Canada will rise in real terms during the period 1978 to 1985 but the boom levels of 1974 are not anticipated until 1985. It is expected that the period to 1980 will amount to a recovery phase and only after 1980 will any real expansionary trends become apparent. The expansion of non-residential work will be faster than average, accelerating from 1978 or 1979 onwards. The construction of a major pipeline to transport Arctic gas south will cause a significant but temporary increase in construction demand and could cause some problems in supply of resource materials depending on the timing of the work. The effects of the pipeline construction will be felt mainly in Western Canada but pipe producers in Ontario will benefit from major orders.

The number of dwelling completions in 1977 is estimated to be 256,000 units, compared with 236,249 for 1976. A record number of dwelling starts in 1976 (273,000 units) will result in a near record number of completions in 1977. Starts in 1977 are estimated to be 245,000 units. At present there is a substantial inventory of completed or nearly completed units on the market. This is resulting in a levelling off of housing prices from the rapidly rising prices of the past several years.

In the medium term, demand for housing is expected to remain at relatively high levels reaching a peak in 1980 of approximately 250,000 units. After 1980 total housing requirements are forecast to decline continuously until 1995 reaching a low of 160,000 units in 1995. Thereafter demand for housing will recover rather slowly.

TABLE 1

Distribution of Incorporated Construction Firms by Size and Type, 1973 Revised

	Number of Firms	Size in Million Dollars of Net Assets					Total
		Under ¼	¼-1	1-5	5-10	Over 10	
		(Number of firms in percentages)					
Building construction	9,744	73.0	19.7	6.1	0.7	0.5	100.0
Highway, bridge, and street	1,161	57.3	27.2	12.8	1.5	1.2	100.0
Other construction	959	60.7	24.0	11.7	1.9	1.7	100.0
Special trade	14,675	86.5	11.3	1.9	0.2	0.1	100.0
All corporations	26,539	79.3	15.5	4.3	0.5	0.4	100.0
		(Sales volume in percentages)					
Building construction	9,744	23.1	30.1	25.2	5.9	15.7	100.0
Highway, bridge, and street	1,161	6.6	19.0	33.5	12.1	28.8	100.0
Other construction	959	6.6	16.9	29.9	9.8	36.8	100.0
Special trade	14,675	39.1	30.2	19.3	5.5	5.9	100.0
All corporations	26,539	25.5	27.6	24.3	6.9	15.7	100.0

Source: Statistics Canada.

TABLE 2

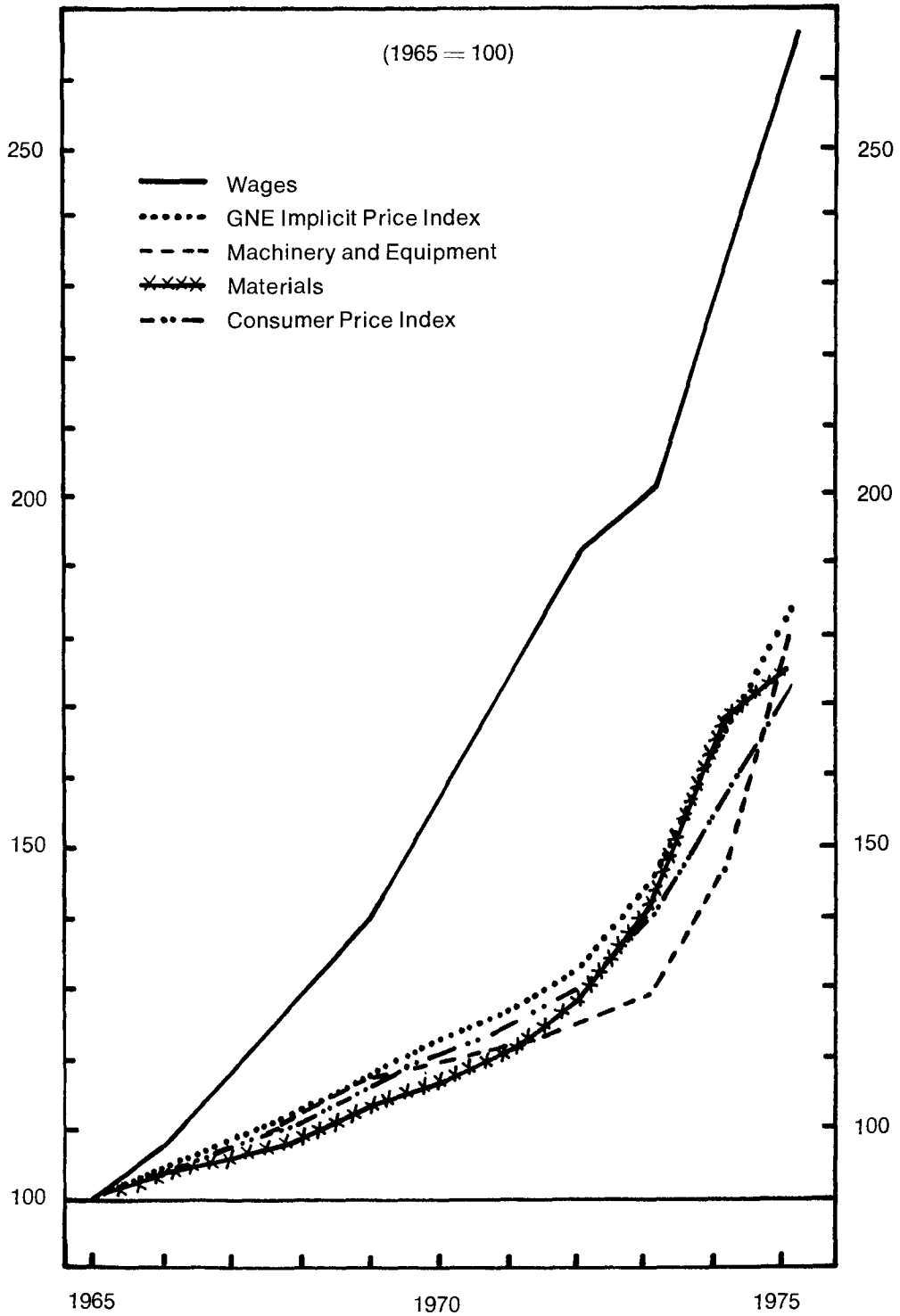
Output Shares of Major Input Categories in Construction,
Selected Industries and the Total Economy, 1966

	Construction industry	Mines quarries oil wells	Machinery industry	Transportation equipment industries	Electrical products industries	Electrical power, gas other utilities	Total economy
Materials	38.6	8.8	41.2	55.5	44.5	3.8	29.6
Labour	35.6	23.4	28.6	23.1	29.6	22.2	30.3
Purchases services	14.5	25.7	14.7	12.9	13.6	12.8	21.8
Government services	5.7	1.3	0.8	0.8	0.8	3.0	3.5
Capital	5.6	40.8	14.7	7.7	11.5	58.2	14.8
Total Output	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: *The Input-Output Structure of the Canadian Economy 1961-1966*, 15-505

Data are from the most recent publication which was issued in January 1976.

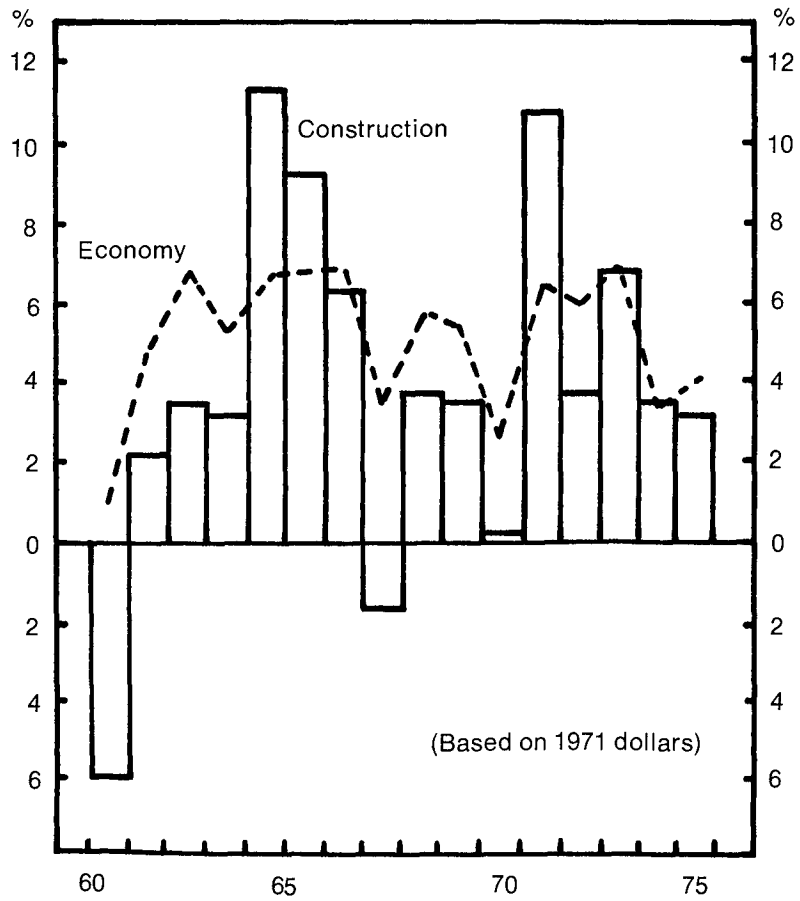
FIGURE 1
CONSTRUCTION WAGE & INPUT PRICE INDEXES



Source: Statistics Canada Publications

FIGURE 2

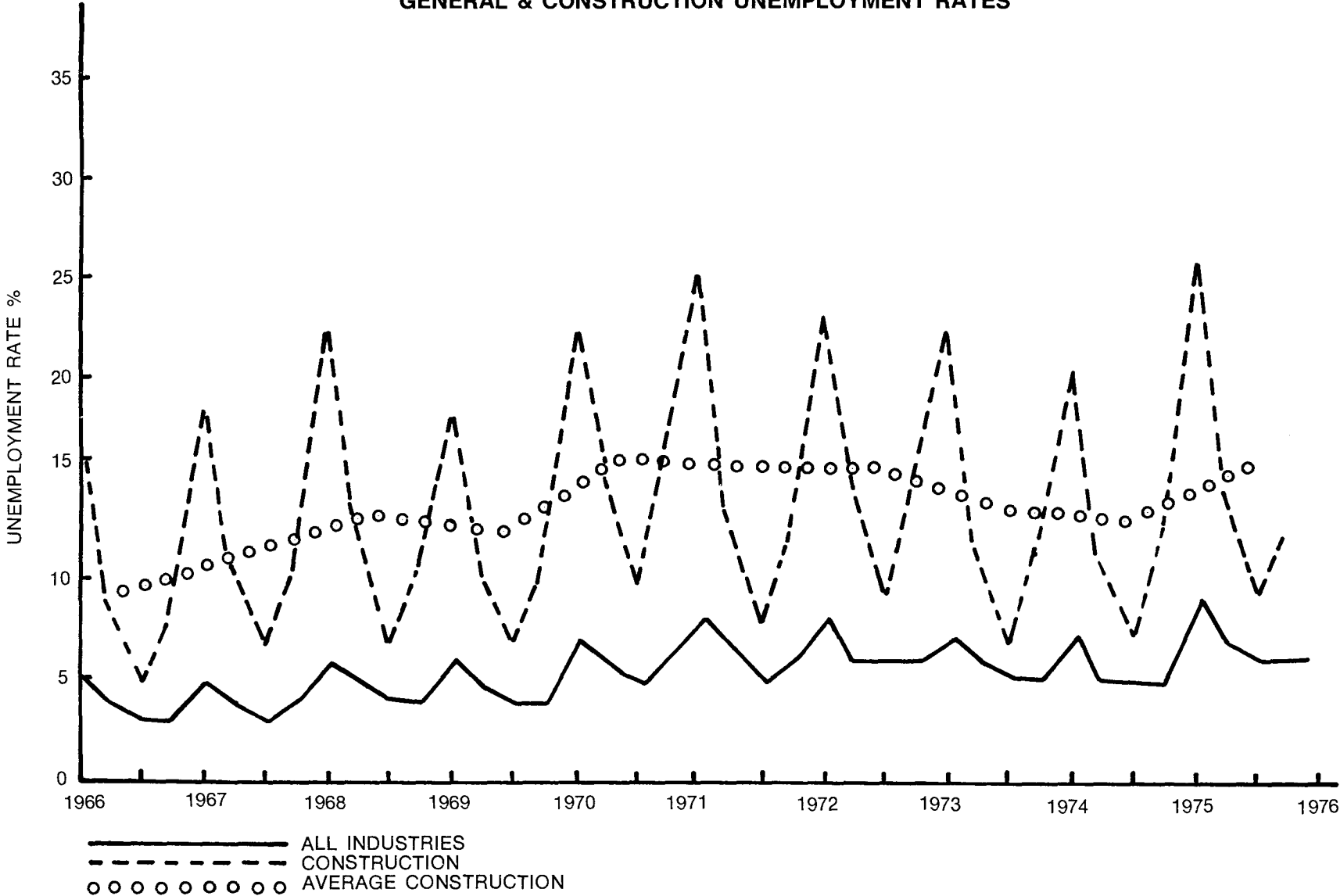
**ANNUAL PERCENTAGE CHANGES IN GNP
NATIONAL PRODUCT & CONSTRUCTION EXPENDITURE**

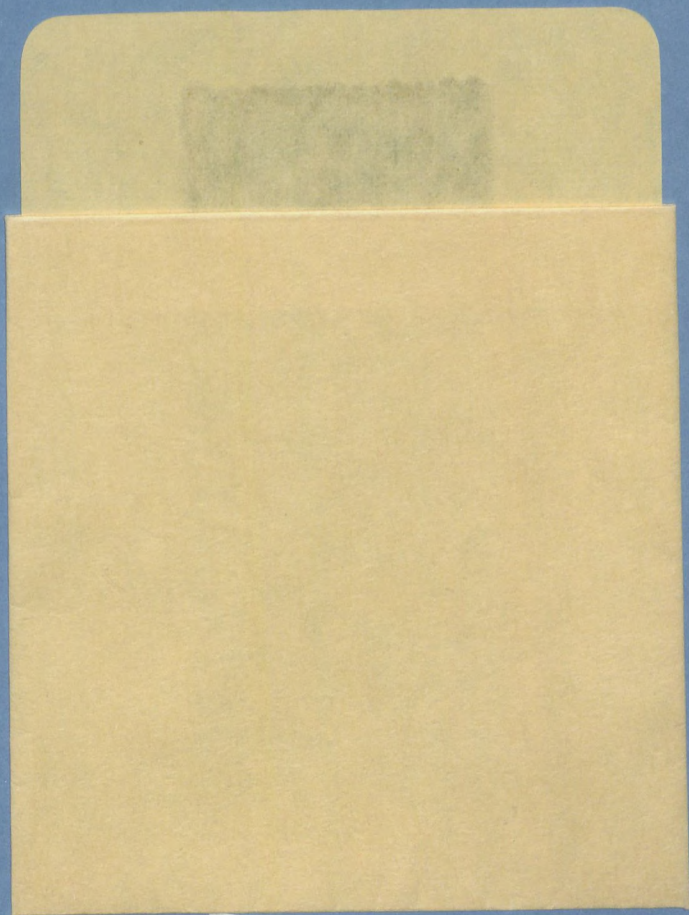


Source: Statistics Canada Publications

FIGURE 3

GENERAL & CONSTRUCTION UNEMPLOYMENT RATES





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