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CONSTRUCTION STATISTICS

(Report by the Secretary-General)

1. It will be recalled that at the twelfth session of the Commission it was requested that a detailed study be made of the problems of and suitable concepts, methods and techniques for gathering data on construction. The study was prepared by an expert and minor changes were made by the ..... Statistical Office. The study is attached.

2. The study was sent out for comments and a summary of the comments is given in document E/CN.3/306.

3. The Commission may wish to discuss the study and the summary of comments together before making its recommendations. The Commission may wish to recommend the form of the publication after the necessary changes are made.

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CONSTRUCTION STATISTICS

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INTRODUCTION

1.1 At their twelfth Session the Statistical Commission requested the Secretary General

> "To make a detailed study of the problems of and suitable concepts, methods and techniques for gathering data on construction, with the aid of the experts, and in consultation when appropriate with countries and regional statistical organisations."

1.2 The request of the Commission arose from their discussion of reports by the Secretary General on "The Systems of Industrial Statistics of Five Highly Industrialised Countries" and on "Some Recent Problems and Developments in Industrial Statistics". From both reports it was clear that despite the need for construction statistics, and although most countries collected some information, there were considerable gaps in the data in many countries.

1.3 The difficulties in collecting statistics of construction are recognised in the International Recommendations of the 1963 World Programme of Basic Industrial Statistics (Statistical Papers Series M, No. 17, Rev. 1, Add. 1) which provide for the optional inclusion of construction in the programme. In addition, reference is made in the recommendations to the need for special treatment for the statistical "unit" in the collection of construction statistics. Very little detailed examination has however been made on an international basis of the problems which arise in connection with statistics of construction.

1.4 The purpose of this study is to provide a kind of handbook to assist countries in initiating, developing or improving statistics on construction. The study is intended to draw attention to the sources from which the statistics can be compiled, the methods by which the data can be obtained, the problems involved in compiling the statistics and the ways in which these problems might be solved. Furthermore the study tries to analyse the

purposes for which construction statistics are intended to serve and the kind of statistics required for these purposes, outlining the concepts and definitions which are most suitable.

Construction activity and therefore the construction statistics differ from the other industrial (mining, manufacturing) activity and statistics. The main differences and the difficulties stemming from these are outlined in the following:

IDENTIFICATION PROBLEMS

1.5 The problems arise both from the nature of the work and from the organisational arrangements for carrying it out. Construction activity takes place on site and not at a fixed location, so that "establishments" in normally accepted sense cannot be identified. Also, because of the mobility of the resources used, although the enterprise may be operated from one address, this can easily be, and in the case of small enterprises frequently is, changed. In almost every market economy country a large proportion of work tends to be undertaken by small enterprises which present these difficulties of identification. These small enterprises also tend to go in and out of business over quite short periods, according to their success and according to the seasonal demand for their services. The preponderance of small enterprises is of course largely due to the small capital resources needed to set up in business, especially if only minor repair and maintenance work is undertaken.

1.6 There is the further problem that a good deal of construction is undertaken by enterprises whose main activities lie in other industries; sometimes such enterprises undertake construction only on their own account but sometimes they undertake it also for other businesses. Construction work is also frequently undertaken by governmental authorities, and by public utilities, both in the field of new construction and, more especially, in the repair and maintenance field. In most countries some work is undertaken by private individuals on their own account, in the case of housing maintenance, for example; but in some countries this sector is of considerable importance in the construction of new dwellings. These all add to the units which have to be identified and to the number from which data have to be collected if complete coverage is required.

ORGANISATIONAL PROBLEMS

1.7 The part played by enterprises also differs. Some firms act as main contractors and accept responsibility for organising the work of carrying out the whole project: they may then either undertake all the work themselves, undertake only part of it and arrange for other enterprises or sub-contractors to undertake the remainder, or they may not undertake any of the work themselves and sub-contract the whole of it. Other enterprises may act solely as sub-contractors, always undertaking only part of a project and undertaking this for another contractor. Alternatively, enterprises may act sometimes as main and sometimes as sub-contractors, and they may undertake part of a project as direct agents of the project owner. Some enterprises supply a complete service of materials and labour, plant, etc.: others supply only labour, leaving materials and plant to be provided by the project owner or by another contractor. These differences in function add to the difficulties of identifying the units and of collecting statistics from them.

1.8 Because the output does not take place at a fixed location men have to be moved from site to site, and the level of activity and the labour force employed by construction units can vary both frequently and substantially. There are therefore special problems in the collection of data on employment.

1.9 In many countries the construction industry includes a large number of small enterprises. These may be responsible for a larger proportion of total output in this industry than are the small enterprises in the other divisions of industrial activity. Therefore in these countries the enumeration of these small establishments in the construction industry is important. Many of the small enterprises will find it difficult to understand some of the complex questions on which data is sought in basic industrial enquiries, and even where they understand, their recording systems may be too poor to provide the data required.

1.10 Moreover, since the greater part of construction output is individual "one off" or "made to measure" products and the period of production is relatively prolonged, there are problems in evaluating the work carried out during a given period. Construction output forms part of capital formation and it has therefore to be linked with the activities in this field. The difficulties which arise in measuring construction output lead to special

problems in fitting it into a comprehensive series of economic statistics.

1.11 One additional question is the seasonality of the work which is due to the fact that work is largely carried out in the open air. In many countries during the winter or rainy season construction work is considerably reduced.

NATIONAL PRACTICES

1.12 The difficulties inherent in collecting construction statistics are evident from the fact that although over 90 countries have some current data on construction output, only 43 countries of the 70 or so countries which carry out basic industrial enquiries at present appear to cover construction activity. Moreover, these countries have used a variety of approaches and methods, sometimes with rather different objectives, and the data collected have varied in type and in range.

THE USE OF ADMINISTRATIVE RECORDS

1.13 In most countries a very important part of construction statistics is to obtain information about the new dwellings provided. This has frequently been possible because permits have to be obtained from local authorities for their erection, and information about these permits can be supplied to a central agency. Use is sometimes made of these permits to obtain data about the size of the dwelling and its value, and sometimes projects are followed up and by use of information on the date of starting, of duration and of completion, estimates of the value of work done are derived. In countries where permits are required for all types of building similar data is sometimes sought for non-residential building. The use of the permit system is in this way extended beyond the collection of the simple data on the total provision of new dwellings. Through the use of this administrative machinery over 90 countries collect some data about dwelling construction, and a large number of them collect some data about other building. Most countries collect the data either monthly or at least quarterly. Often, however, the data collected has limitations. For example, in the United States, where permits for few dwellings are generally required, they are not required in rural areas: this is also the case in parts of New Zealand. In other countries only large towns require permits. Supplementary enquiries have then to be carried out if full coverage is required, but frequently this has not yet proved practicable.

1.13 In other countries occupancy permits are needed to move into the dwellings, i.e. when the dwelling is ready as a living space. The number of these permits are valuable indicators of the number of dwellings completed.

1.14 Administrative records of this kind frequently form the basis for the collection of current data on employment. This, however, often leads to incomplete coverage, since labour employed off site on plant maintenance or on the preparation of joinery, for example, is difficult to allocate and will tend to be omitted.

1.15 The main reason for the failure to include construction in basic industrial statistics is of course the difficulty of identifying the units, and administrative records based on building permits seldom form a satisfactory basis for complete identification. Other forms of administrative records such as social insurance schemes or trade union records can be used, but many of the difficulties frequently remain and full coverage is not practicable. In most cases these cannot cover the working proprietors, the self-employed etc. Even, however, where the difficulties of identification have been more or less overcome some of the other difficulties referred to above remain.

1.16 For basic industrial enquiries it is recommended that statistics of the structure of the industry and of both output and input data in terms of employment, man hours, earnings, capacity of power equipment installed, expenditure on fixed assets purchased, materials and services purchased, should be collected. In some countries like Western Germany, where comprehensive statistics of construction are available, little data has been collected about some parts of the input sector. In Canada, where the approach to construction has been mainly through expenditure on construction rather than through production, there is only limited information about the structure of the construction industries. In the centrally planned economies the output and also input are usually covered. However, many countries which have not included construction in previous enquiries plan to do so for 1963, and many plan more extensive enquiries.

1.17 Construction presents problems not only in respect of the collection of primary data but also in the measurement of derived statistics. For a variety of purposes measures of production, of costs and prices and of productivity are required, and of the changes that are occurring in these measures. These are all difficult to obtain because of the wide range of products and because exactly identical products, identical in terms of site similarity and of type of construction, are rarely produced. Different methods of measuring these factors have been adopted in different countries but it must be admitted that they generally have serious limitations. This problem is the same as the problem of new products in the manufacturing industry. But in manufacturing this question only influences a small part of the industry, whereas in the construction industry it is a general problem.

1.18 A simple example is the price of dwellings. In most countries this is the product of which the greatest number of most nearly identical products are constructed and changes in the average price of dwellings might be expected to provide a basis for measuring changes in the price of building. In practice, changes in standards, including changes in size and in methods of construction, are usually occurring, and since these affect the price of the dwelling some adjustments are needed before average prices can be used to provide price index numbers. The adjustments can be made by calculating the price per m^2 floor space and classifying according to the equipment available etc. But even with these adjustments it is difficult to compile reliable index numbers and in addition to this, it is probable that dwellings are not sufficiently representative of the industry as a whole.

OUTLINE OF THE REPORT

1.19 In Chapter 2 of this report the purposes for which construction statistics are required are defined. The statistics of construction collected in different countries, which are set out in tabular form in the Annexes, are then examined briefly together with the bases on which they are collected and the concepts adopted in their collection. The description of the practices adopted by different countries should be helpful in suggesting methods which may be usefully tried out elsewhere. The report should also, by providing the background to the construction statistics of different countries, enable international comparisons to be made more effectively.

1.20 In Part II, following the examination of the material available and the practices adopted in different countries, the present international recommendations for basic industrial enquiries are examined in relation to the collection of statistics of construction. Proposals are also made for the extension of these recommendations in fields not at present covered by them and suggestions for the collection of current construction data are put forward. Derived statistics are also discussed.

1.21 This part of the report is divided into four chapters. The first two deal respectively with the definition of the statistical unit to be used, and the different types of enquiries to be undertaken, the field to be covered in these enquiries, and then with the data to be collected and the frequency of collection of primary data. A subsequent chapter deals briefly with the problems of derived statistics, including index numbers of production, of prices, and of productivity, and the final section discusses the methods by which construction statistics may be collected, with particular reference to the source of information about the statistical unit.

CHAPTER 2

THE SCOPE OF CONSTRUCTION STATISTICS

2.1 Statistics of construction are required for a number of purposes, and the information collected should be designed to meet these purposes as far as possible. In many industrialised countries construction activity represents 10% or more of industrial activity: a large proportion of the total labour force are employed on construction work and construction plays an important part in gross fixed capital formation. Information about this section of activity is therefore essential for the formation of economic policy and for economic planning.

Purposes for which statistics are required

2.2 It is possible to distinguish these main purposes for which data about construction activity are needed. In the first place, because of its size and importance in the economy of most countries, data about its activities are required in order to construct a picture of the whole economy. This will include data about production, about employment and input, and, as with other industries, about capital investment and stocks. This data is required in order to build up a system of national accounts. In some countries data on capital investment in construction is not and cannot be obtained from the agencies undertaking the expenditure, and the output of construction work is used to measure capital formation. Moreover, it is difficult in most countries to collect data on private expenditure on dwellings and production figures have to be used to measure capital formation in this field. It is of course important that as far as possible expenditure and production series of data, if they are both to be used, should supplement each other. This often presents difficulties because problems of definition of construction and investment arise.

2.3 Secondly, data on construction has to be provided to meet economic planning and administrative needs. The planning of construction activity is very important in every country. The products of the construction industry provide a large part of the investment goods. These help to solve many social questions and are important factors in the development of the economy generally. For example the governments in most countries are concerned with the development of the transport industry by improving the road-rail-airport system. In addition they are concerned to see that the population are housed and that schools

are provided, and they are, of course, concerned to see that buildings are safe and are erected in places which do not conflict with national needs; this means that they need to know in some detail what construction is being undertaken and where it is taking place. In many countries where the government is responsible for the planning of a considerable part of the expenditure on construction activity, construction statistics are of course used to control the fulfillment of these plans.

2.4 Finally, again partly because of its size and importance in the national economy, there is interest in the structure, the organisation and the efficiency of the industry itself. It is these aspects which will be of most interest to the units themselves in the industry. In order to examine the industry, data on its legal organisation, on employment, on input costs, on output, and on general organisation will be required. To meet all these purposes both basic and current statistical enquiries need to be undertaken. Some of the data only need to be sought in less frequent enquiries or on an annual basis, and such enquiries frequently provide benchmark data for use as a basis for the collection of current data. A good deal of data is needed currently, but the extent to which these needs can be met varies, because the problems of collection are greater in some countries than in others.

2.5 A summary of the data collected by different countries is provided in the Annexes as follows:-

Annex Ia, b and c	Data collected in annual and less frequent basic enquiries.
Annex IIa and b	Data collected in current enquiries.
Annex III	Detailed analyses of the data collected in 16 countries.
Annex IV	Derived data - Index numbers of employment, production, prices and productivity.

TYPES OF DATA REQUIRED

(A) Primary Data

(i) Legal Organisation

2.6 As with other industsies, data on the legal organisation of enterprises is required for construction units. The categories used vary in different countries, but partnerships, limited liability companies, co-operatives are frequently distinguished. In Italy nine types of organisations are distinguished, including distinctions between public and private enterprises. About 60 per cent of the countries

carrying out basic enquiries seek data on organisation. A special arrangement in the case of construction units is the formation of consortia to undertake large single projects, and many countries seek data about these. In addition, in many countries there are a large number of enterprises with no employees. Such enterprises often consist of a number of working principals who band together and often sub-contract only their labour, materials being supplied by the main contractor. When these enterprises can be included in the enquiryit is usually desirable to distinguish them. Data is also sought in many countries about relations with other enterprises and in particular with enterprises whose major activity is in other groups of industry.

(ii) Economic Organisation and Distribution

2.7 Many countries seek information about the geographical distribution of enterprises, and are interested in any changes which are occurring. In many cases the geographical distribution of enterprises (which means the location of the head office) does not show the distribution of the actual construction activity. The large enterprises may carry out work outside the geographical area of their head office, therefore for an accurate measuring of the geographical distribution of actual construction activity statistics based on the site unit are needed. As with other industries, information about the size of enterprises, measured by both employment and output, is also obtained in order to provide data on the structure of the industry. It should be borne in mind that the size of the enterprises is changing much more quickly than in the manufacturing industry. Enterprises undertaking construction are usually organised into groups with rather different functions. For example, they may be builders or civil engineers undertaking mainly building or civil engineering work or they may undertake both types of work. They may undertake only new construction or only repair and maintenance work or they may undertake both. They may be main or "prime" contractors accepting responsibility for undertaking the whole of a job or they may be specialists such as carpenters, heating and ventilating engineering contractors who undertake mainly sub-contract work of one kind only. Information about the number of enterprises of different kinds is essential to a proper economic study of the operation of the industry and many countries seek the necessary data. The methods of classification differ however because the organisation varies in different countries.

(iii) Employment

2.8 Most countries need data on employment in the construction industries because their share of total employment is generally substantial. Moreover in some countries, as in France for example, employment data are used to provide a measure of production. Not every country is successful in obtaining either current or annual data, however, but all the 43 countries with basic enquiries into construction do obtain such data either in their basic enquiries or in their current statistics. The data collected usually distinguish between directors and administrative employees and operatives. The organisation differs in different countries, but in many a variety of professional staff are employed, and data are required about these to enable, for example, future requirements and the need for training facilities for these professions to be assessed. Special enquiries may be made to obtain these data.

2.9 Separate data are needed about the employment of operatives and about the employment of male and female workers, although this may be less important in construction in some countries: in particular, many countries do not employ female workers on site work, so no distinction has to be obtained in the category of operatives.

2.10 A large proportion of the labour force employed are skilled men with a variety of skills. These skills have to be learned, and in many countries this is done by apprenticeship. To ascertain the need for apprentices and to make sure that sufficient craftsmen are produced to meet future demands, data on the craft skill of the skilled labour force are obtained, and these are sometimes obtained separately for different types of work. When the apprentices are trained in the industry (and not in technical schools) data are frequently sought on the total number of apprentices employed, and this sometimes distinguishes between the craft skill to which the employee is apprenticed.

2.11 In addition to the overall figures, data are obtained in some countries of the number of men employed on different types of construction. This is needed if, for example, it is desired to measure productivity in the industry or to give priority in the supply of labour to certain types of construction. The data are specially collected in some countries, but in others the method of collecting employment data from construction sites provides it directly.

2.12 Data on man hours worked by operatives are usually sought, to provide a good measurement of labour input for the calculation of labour productivity. Although data on the average number of operatives might indicate labour input, the number of man-hours worked per operative may vary considerably. In some countries the data on man-hours are subdivided according to the system of payment (e.g. piece wages, time wages).

(iv) Input Costs

2.13 For the assessment of net output or value added and also for the examination of the efficiency of the units, data about the total input costs of the industry are required. Some of these input costs - on capital expenditure and in stock for example - will be needed to combine with data collected from other industries to form national totals, and others, such as data on earnings, are needed for comparison with earnings and changes in earnings in other industries. To meet these needs most countries collecting construction data seek data about earnings and other labour costs, social insurance, etc. (usually with separate data for different groups of employees), about capital expenditure, about stocks, and about expenditure on materials and on other goods and services. In some countries data on power equipment installed and purchased are required because of the need to assess demands for power, and data on the types of equipment owned are also sought.

2.14 Data on the usage of individual materials measured in physical units are helpful in assessing future demands for the material. Some materials (e.g. bricks, cement) are usually used by the construction industry only, therefore the consumption of these materials can be derived from the output (if necessary corrected by foreign trade data) of the relevant manufacturing industry. Other materials are used by other industries too and then it is important to know the consumption for construction. Data on consumption by different enterprises may also provide information on consumption for different types of construction, and if future programmes are known, more reliable assessments of future demand can then be made. Many countries seek data of this kind, the individual materials for which data is sought varying because methods of construction vary and different structural materials are of major importance in different countries.

(v) Output Data

2.15 Data about the total output of construction are needed to form part of the total measure of the economic output of the country and it is also needed as a measure of the level of activity in the construction industry. Data are required not only about the total output, however; for administrative and social needs data are also required about different groups of the finished products of construction, for example, of dwellings, of schools, of power stations, of roads and of a variety of other types of structure. In some countries data are collected for the output of different groups of finished and unfinished products of construction which will show the distribution of the total output by different product groups.

2.16 Much of the data collected, in particular for administration purposes, are collected in terms of physical units, but some countries also collect figures of the value of work done on the projects for which the physical measures are available. In nearly every country information is needed about the new stock of buildings, and particularly of the number of houses provided and of their location, and for many purposes these data need to be further analysed. For example, some countries collect separate data for residential and non-residential buildings, and others divide the latter according to whether they are for offices, factories, warehouses, schools, hotels, and a variety of other purposes, and list varying in different countries. Generally, some measure of the floor area or volume of the buildings is also required, and in addition the type of ownership is often considered important - for example, a distinction is made between buildings for private owners, for local or other public authorities, and for housing associations and co-operatives. Data on the method of construction are at present collected by only a few countries, but they are likely to become increasingly important because they will show, for example, what progress is being made in the adoption of new methods, and they will also be required in connection with the estimation of requirements of materials and of labour.

2.17 The data in physical units can refer to

(a) size of the product (e.g. m^2 of floor area, or m^3 of the building, or kms. of roads provided)

(b) some measurement of the use (e.g. number of school places in a school, number of hospital beds in a hospital)

(c) other particulars (e.g. type of dwelling, single multi-unit)

2.18 Once a project is identified, data of this kind can be recorded and collated, but, in addition, for administration purposes, data on the progress on the projects are needed. In many countries this is obtained in the form of progress reports which indicate the number and sometimes also the value of buildings of different types started, completed, and under construction. If however a measure of the current output of construction is to be derived, this kind of data, provided in physical terms, needs to be supplemented by data on the value of work done, at best in each category, but if this is impracticable in rather fewer categories. Many countries do provide value data of this kind, some estimating it from the data on physical units and others basing it on direct collection from construction units.

2.19 For many types of work physical measures of output are of course impracticable, and value measures have to be collected if any data are to be provided. This is the case, in particular, for civil engineering projects such as water and sewerage schemes, and power stations, and also for repair and maintenance work. In many countries, as in New Zealand, for example, civil engineering work is undertaken only or mainly on behalf of public authorities, and data on the value of work done, or the expenditure, are collected currently from the public authority concerned. Data on the current output of repair and maintenance work are collected in the United Kingdom, in Canada and in Ghana and in the centrally planned economies. The amount of repair and maintenance work done on different types of structures is of interest; for example it may be desired to relate this to rates of depreciation, and separate figures for residential and non-residential construction are collected in these countries, for a large variety of different types of building.

(vi) Ancillary Activities

2.20 Data on employment, on input costs, and on output of ancillary activities which form part of the main activity of a unit are needed if complete coverage of economic activity on construction is to be obtained. In the case of construction the ancillary activities include the central offices from which the organisation is run, architectural offices in case they are part of the construction enterprise, and depots

which store plant and materials for use on construction sites. In addition, production units for the production, for example, of joinery, precast concrete products, or of fabricated steel, may form part of the construction unit. Most countries collect data for these ancillary activities in their basic enquiries on construction, regarding them as part of the main activity of the unit even though they may sometimes also produce goods for sale. (If the production units have separate accounts they should of course be classified to the appropriate industrial activity and should not form part of the construction enquiry[1/].) In current enquiries when data are sought in respect of individual projects, these ancillary activities are often excluded. For example in the Netherlands and in Australia labour employed off site is not included in the current employment statistics.

(vii) Geographical Distribution

2.21 As was indicated earlier in paragraph 2.7 the problem of the geographical breakdown of data is a difficult one. It is however possible for certain data to be obtained on the basis of the site unit although the enterprise could be retained as the reporting unit. The difficulties involved can be considerable and it is advisable to confine the items of data requested on this basis to the items most easily broken down such as employment.

(B) Derived Statistics

(i) Index Numbers of Employment

2.22 Some countries publish index numbers of employment in construction. These are published as part of current data, and if the collection of detailed statistics with adequate coverage of the whole industry is practicable the calculation of the index numbers provides no problems. It is however possible to construct a satisfactory index number with more limited data if the changes in employment over a more restricted field can be ascertained and can be accepted as a reasonable guide to the changes in the total. Most countries publish index numbers for total employment only, not distinguishing between the types of work on which the labour is employed.

1/ Except where data are being sought on an enterprise basis.

(ii) Index Numbers of Production

2.23 A measure of the production of construction is required both to form part of the measure of total national industrial production and as a measure of activity in the industry. Ideally the measure is required on a current basis, but few countries at present have the data necessary for such a measure. There are already considerable conceptual difficulties in measuring output on a product so diverse as construction, and no method can be expected to be precise. However, many countries do provide measures of production for construction but they calculate it in a number of different ways. Some make use of data on employment and man hours, corrected, when possible, for changes in productivity. Some countries base their calculation on the volume of work carried out measured in physical terms. Others calculate index numbers of production using the value of either gross or net output and correcting it by price indexes. Countries which have output data for different types of work can improve the reliability of the measure. In order to incorporate the production of the industry with other industrial products the value added or net output is needed as a weighting factor but this is only available in those countries in which the input cost data are collected.

(iii) Index Numbers of Costs and Prices

2.24 Measures of changes in input costs and in output prices are required for a number of purposes. Price levels are important economic factors; for example, the price of living accommodation, and therefore the price of new dwellings, plays an important part in the cost of living. In addition, many of the methods of measuring changes in production and productivity depend on correcting to constant prices the figures collected at current prices, and a measure of changes in output prices is essential for this. Measures of changes in input costs are needed to show the changes in the costs of the industry, to compare them for example with changes in input costs in other industries and to compare them with changes in output prices.

2.25 Methods for measuring price changes are still being developed but many countries do calculate an index number of some kind. Use is frequently made of data on the price of materials and on earnings corrected by the change in productivity, and on overheads and profits. Alternatively, measured quantities or units of building work are repriced or standard buildings are repriced at

regular intervals. If the first method is to be used data on earnings are needed as they are for the purposes mentioned in paragraph 2.13. In addition, index numbers of changes in the price of building materials are needed, and these are provided in many countries. The latter are, of course, also needed to provide an integrated system of price changes in industry. Both input and output costs may vary for different types of work, and changes in earnings and in the prices of materials on different types of work are used when they are available. In practice many countries at present only have cost data for dwellings. The price information required for repricing measured "quantities or units of building" or for repricing standard buildings are collected by special enquiries in many countries.

(iv) Index Numbers of Labour Productivity

2.26 There are also conceptual difficulties in measuring labour productivity changes, but in countries where changes in output and in manpower are available, crude measures of changes in productivity are available: few countries at present publish these data. A measure of changes in productivity, however crude, provides some guide to the rate at which the efficiency of the industry is increasing, and it is needed if forecasts of the future capacity of the industry are required or of its probable demand for labour to meet a known programme as well as to provide part of the data needed in measuring changes in the cost of building by some methods.

(C) International Comparisons

2.27 The data needed for international comparisons are not always the same as those needed for national purposes. Comparisons are looked for between capital formation in construction in different countries both in relation to total capital formation and in relation to gross national product. For example, comparisons are frequently made of the proportions of gross national product devoted to expenditure on new dwellings. In addition, comparison between total construction expenditure, including expenditure on the repair and maintenance of existing assets or structures, are of interest. Such comparisons are really only justified if the definitions and fields covered are similar or can be adjusted so as to correspond, and much examination of the data is necessary if this comparability is to be achieved. Even when the definitions and fields covered are the same, the differing price

structures of the individual countries may disturb the comparability of these proportions.

2.28 International comparisons between the structure of the industry and the arrangements for undertaking work are also of interest. This is particularly the case because in many countries there has been a failure during the past ten to fifteen years to meet all the needs for construction, and the methods by which these difficulties have been overcome are likely to be reflected in some of the data. For example, many countries have adopted techniques making greater use of prefabrication, and statistics showing the extent of this and the rate of development would be of interest to other countries. In the same way, changes in production in the industry, in its productivity and efficiency and in its costs will be of interest provided that these indexes are comparable.

(D) Frequency and Type of Enquiry

2.29 The fields which have to be covered to meet the separate purposes outlined above are different, and even in countries with highly developed statistical systems it is frequently not possible to meet all of them or to meet all of them equally satisfactorily. The administrative systems in different countries vary, and it is therefore often possible to meet different purposes more easily in some countries than in others. In every country the collection of statistics of construction is costly and presents greater problems than those associated with the collection of most other industrial statistics. The development of an integrated series of statistics must therefore be a slow process.

(i) Frequency of Enquiry

(a) Annual and Less frequent enquiries

2.30 The frequency with which the data which are required need to be collected varies. Information about legal organisation is usually only required as part of an infrequent survey or a full scale census taken every five or ten years. Similarly, much of the data about input costs is not sought more frequently than annually or in less frequent surveys which take the form of full censuses. Also it is not usually desired to analyse the structure of the industries, for example their economic organisation, except at most on an annual basis. Data on employment is needed for this, and employment data enables the enquiries to be used as benchmarks or as frames for more frequent enquiries. Changes in structure and employment in construction can however be so

frequent that annual enquiries rather than quinquennial or decennial enquiries can often be justified. More frequent enquiries also assist in maintaining the list of units, and some of the detailed data on employment, such as data on functional status, on sex, craft skill, is needed annually in many countries.

2.31 Most countries collect data on capital expenditure in the whole economy only annually or less frequently, but some include this in other current surveys using the less frequent enquiries as frames for a sample enquiry (see para. 2.32).

(b) Current Enquiries

2.32 The main data sought in current enquiries are data about employment and output. Because, however, of the economic importance of assessing the total national level of capital formation during the current period and of stocks, quarterly enquiries which include construction are undertaken in many countries in different fields of the economy to obtain data in these two subjects. Current data on employment are needed to measure changes in the total national employment as well as to show what is happening in construction and most countries carry out either monthly or quarterly enquiries which include construction. Many countries also seek current data on hours worked, since this is a measure of the level of activity, and also, for national accounting and wage policy purposes, data on earnings. In addition, if the output of construction is to be included in the monthly or quarterly measures of production then data on total output, at least, must be obtained, but only a few countries, including Bolivia, Ghana, Rhodesia, Sweden, Thailand, the United Kingdom and the USSR and other centrally planned economies organise the collection of suitable data.

2.33 Some data about construction output, and in particular the data needed for administration, planning, and plan controlling purposes, are however obtained in most countries more frequently than annually. This is the case for example in respect of data about permits for building. In many countries permits are needed before building can be started; they are usually required as part of the administrative machinery of the government and may be required, for example, because of the need to ensure that the buildings comply with the appropriate regulations, or in connection with land use, or in some cases in order to restrict the amount of construction started. The permits

are usually issued by local authorities, and either copies of these permits are sent to the appropriate statistical bureau, as in New Zealand, or more frequently the information required is first summarized by the local authority and the summaries are then centrally collated. When copies of the permits are forwarded there is usually no difficulty in collating the data they provide monthly. In other cases, when the data are summarized locally collection is often only quarterly. The permits form the basis for collecting data on the starting of the buildings, on the progress made and on the number of buildings completed. Because of its social importance most countries require data on the number of dwellings started and completed at least quarterly and many require it monthly in order to provide information on the progress of the housing programme; many countries collect similar data for other buildings at the same time.

2.34 In some countries the kind of data referred to in para. 2.33 which is obtained for administrative purposes is used to provide a measure of output. For example, progress on individual projects whose total value is known can be used to provide an estimate of the value of work done during the period, so that a quarterly measure of changes in production can be derived. Frequently, however, permits are only required for building and therefore this method does not provide a measure of total construction output.

2.35 Current data are also needed for most of the other derived measures referred to in para. 2.22 et seq. For example, most countries which prepare wholesale price index series provide them monthly, and when building materials prices are included the data are also collected monthly. It is not however usually practical or indeed necessary to provide index numbers of building costs and prices or of productivity more frequently than quarterly.

(ii) Types of Enquiry

(a) Institutional Enquiries

2.36 Most of the statistics required on an annual or less frequent basis are collected on an institutional basis direct from the industry. The enquiries in some countries form part of the whole series of industrial statistics, and it is in some cases both desirable and convenient to include the construction industries in order to obtain comprehensive data for the whole industrial field. Group 400 of the International Standard Classification extends also to construction undertaken by labour employed by governmental authorities,

and if the enquiry is to cover the whole of the field these activities must also be covered. Many countries do include public authorities in their enquiries but frequently less data is collected from them. Some forty-three countries have already included construction in basic industrial enquiries; many in enquiries taken every ten years, as in Austria, Belgium, Brazil, Denmark, Finland and Sweden; others, including the United Arab Republic, Iceland and Japan, in enquiries taken every three years; in some thirteen countries annual enquiries are undertaken.

2.37 The scope of these enquiries varies. Some as in those carried out in the United Arab Republic and in Libya, are designed to provide a list of establishments; others, as in France, also include information about total employment. In Sweden and Norway the decennial censuses include also data about earnings and about the value of output and purchases of materials, fuels, etc.

2.38 Almost without exception these enquiries are full scale census enquiries covering the whole industry, but in some countries, as in Iceland and in Canada, the smaller units in the industry are covered only by samples. In Italy and in the United Kingdom annual enquiries are based on samples but these are alternated with full census enquiries triennially in Italy and quinquennially in the United Kingdom.

2.39 Few market economy countries at present carry out current enquiries into the construction industry on an institutional basis. But in the centrally planned economies the current enquiries are usually carried out on an institutional basis. These are undertaken in respect of output monthly in Yugoslavia and quarterly in the countries mentioned in para. 2.32, and monthly in France, in the United Kingdom, and in the USSR. In some countries, including France, the Federal Republic of Germany, and the United Kingdom, data on earnings and hours worked are also collected quarterly on an institutional basis.

The Use of Administrative Records

2.40 Almost every country makes some use of its administrative records in collecting data about construction. Often these form the basis for the collection of basic data but more frequently they are used in connection with the collection of current data. Administrative records are used in particular for collecting data on housing and on other forms of building for which permits and licenses are required. The data collected are obtained on a project basis. Sometimes the data collected cover only the number of permits and other

physical measures about the buildings for which the permits are issued - such as the area - but frequently they include also the value of the projects. In many countries, including New Zealand and Denmark, data are collected on the progress or completion of the buildings through the local authorities who issue the permit, and calculations are made on the value of work done. In Canada the Central Mortgage and Housing Corporation are responsible for reporting every month. In the Netherlands the value of work done on the projects is estimated by building inspectors. In other countries, such as Australia, the name of the builder is obtained when the permit is issued and he is asked to make a quarterly return of the value of work done on the project. Administrative records can in this way be used to provide a list of builders.

2.41 Data based on administrative records of this kind are usually available monthly or at least quarterly because the records are by their nature required to be kept up-to-date. There are advantages in collecting data on construction in this way in terms of individual projects. It enables analyses on a geographical basis to be made, but also such data lends itself more readily to analyses by type of building, by method of construction, and by ownership: data can be collected, for example, on employment for different types of work (although there will be difficulty in including off-site employees). A further advantage for some purposes is that it enables construction carried out by agencies other than the construction industry to be included. This will frequently include public authorities of all kinds, but also, in the case of housing, private persons building their own houses. These agencies may be difficult to cover on an institutional basis. Data based on such administrative records are however often incomplete because permits are not required for every type of building or in every locality. Permits are also not required for civil engineering projects in most countries and the administrative records of this kind can therefore only be used for collecting data about building. Moreover, permits are rarely required for small jobs or for repair and maintenance work, and if data are to be collected about these some other approach is necessary. Data based on permits in many countries are incomplete due to administrative difficulties (e.g. a large part of housebuilders - especially in villages - fail to ask for a permit).

2.42 Use is made also of other types of administrative records. For example, in New Zealand tax returns are analysed to provide figures of total income and of expenditure for each unit, with separate figures for expenditure on labour and materials etc. In Canada a list of companies in construction is provided by the Department of National Revenue. Social insurance records are also often used to provide a list of units for institutional enquiries and in particular as a basis for the collection of employment statistics. Sometimes records kept by the trade unions can be used for the compilation of employment data.

Functional Enquiries

2.43 Many countries which do not collect current statistics of output from the construction industry do include the industry in functional surveys of employment (and frequently analyse the data so as to provide separate figures for employment in construction) and include it also in surveys of capital expenditure and of stocks. For example, in some countries, including the U.S.A. and Finland, monthly employment data are collected by a sample labour force survey undertaken on a household basis. In some countries enquiries into employment undertaken on a functional basis make use of administrative records such as social insurance, but these do not always enable separate figures to be provided for construction.

2.44 In Canada it may be said that the whole approach to construction statistics is on a functional basis since the main statistics of output are obtained from information on capital formation in construction. A very elaborate enquiry is undertaken among all private firms and public authorities who are responsible for capital expenditure in any form. (For housing the production figures are used.) The enquiry is designed so as to obtain at the same time separate information about expenditure on repair and maintenance by both private and public authorities. A survey of householders is undertaken to ascertain their expenditure in this field. Output data collected from the construction industry annually are collected on a sample basis only and are grossed up to the figures collected from the capital expenditure enquiry. Current output statistics are based on interpolation using data on employment and hours worked. An enquiry of this kind lends itself to detailed analyses of the production of different kinds of building and to geographical analysis. It does not however provide a basis for an economic assessment of the structure and activities of the industry itself.

PART II

CHAPTER 3

THE STATISTICAL UNITS TO BE USED

Definition of Construction

3.1 In the International Standard Industrial Classification of all Economic Activities construction is classified to Division 4 and is defined as follows:

> "Construction, repair and demolition of buildings, highways, streets and culverts; heavy construction of such projects as sewers and water mains, railway roadbeds, railroads, piers, tunnels, subways, elevated highways, bridges, viaducts, dams, drainage projects, sanitation projects, aqueducts, irrigation and flood-control projects, hydro-electric plants, water power projects, gas mains, pipe-lines and all other types of heavy construction; marine construction such as dredging, under-water rock removal, pile driving, land draining and reclamation, construction of harbours and water-ways; water wells; airports; athletic fields, golf courses; swimming pools; tennis courts; parking areas, communication systems such as telephone and telegraph lines; and all other construction, whether undertaken by private bodies or governmental authorities. Special trade contractors in the field of construction, such as carpenters, plumbers, plasterers and electricians, are also included in this group.
>
> "This division does not include construction, repair and demolition work undertaken as an ancillary activity by the staff and for the use of an establishment classified in any other division of the classification. Excavating, overburden removal, shaft sinking and dredging, when undertaken in connexion with mining, are classified in the appropriate group of division 1 (Mining and quarrying)."

3.2 The purpose of the International Standard Industrial Classification is to provide an up-to-date framework for the international comparison of national statistics. In cases where the need is for statistics of construction which can form part of an integrated series of industrial statistics for international comparison it will be essential therefore to arrange that however the construction statistics are collected they can be grouped so as to fit into the definition of Division 4. The classification is by kind of economic activity and is designed to include units which either undertake only construction work or whose main activity is construction. The classification corresponds to the classification of other industrial

units, and although there may be difficulties in collecting the statistics they are not the result of difficulties in defining the producing units. Except in the countries with centrally planned economies, where no problems arise, the inclusion of construction undertaken by governmental authorities may present more difficulty because the activities will be more mixed and because the authorities have other large and more important fields of activity; more precise definition may therefore be needed.

3.3 The organisation of construction activity differs, but in many countries, including for example Austria, the Netherlands, New Zealand, Canada, and the United Kingdom, some government departments, local authorities, and sometimes also publicly owned industries such as the railways, the coal, gas and electricity supply industries, and water supply employ labour to undertake construction work on their behalf. It will however frequently be difficult to separate these units from some of the other activities undertaken by the authorities. For example, men employed by local authorities may undertake both the maintenance of roads, which is an activity classified to Division 4, as well as the clearance of snow, with which the Division is not concerned; men employed on rail-road maintenance may also carry out both types of work for the railways. The statistics collected of their activities may therefore be variable in scope. In countries where the share of construction activity undertaken by public authorities is large their inclusion in the data collected is probably essential as the International Standard Industrial Classification indicates, but when this is not the case it will often be easier to treat the construction output as an ancillary activity and then as other ancillary activities are treated (see para. 3.7).

3.4 In practice most countries classify units whose main activity falls into the fields mentioned in the definition of construction in Division 4 as construction. There are marginal differences and some of these are referred to later, but in general no problem of definition arises for the construction industry itself. The forty or so countries including construction in their basic long term or annual industrial surveys of economic activity or in subsidiary enquiries usually appear to define it in this way and the statistics collected should be broadly suitable for international comparison.

3.5 Other forms of enquiry, however, are undertaken in most countries, in which statistics are required of the whole of construction activity irrespective of the main economic activity of the producing agency. This is necessary for planning the construction industry and its resources (material, labour). In some countries for national accounts purposes also the whole value of construction activity is used. In such enquiries, which are functional rather than institutional in approach and which are frequently based on administrative records, it will be necessary, if the statistics are to fit into the definition of Division 4, to collect separate information for that part of the activity carried out is an ancillary activity by establishments classified to other divisions of the classification. This will not always be practical: for example, if building statistics are collected from the authority issuing permits to build they may include buildings constructed by private undertakings classified to other industries, and it may not be possible for the authority to provide separate statistics for such groups. Similar difficulties are likely to occur in certain types of employment enquiry. When these difficulties occur it means that there is overlap with statistics collected from other industries on an industrial classification basis, and if this is unavoidable it needs to be made clear in the published statistics.

The Statistical Unit

The Unit for Institutional Enquiries

3.6 Industrial classifications are designed to classify data on a kind of activity basis and generally the establishment is regarded therefore as the most suitable unit for classification. Ideally, the establishment is an economic unit which engages under a single ownership or control in one or predominately one kind of economic activity at a single physical location. The local unit - which is also often used - comprises, ideally, all the industrial activity carried on at a single location under a single ownership or control. These units are distinguished from the legal entity (enterprise) - which is the owning and controlling unit and may consist of one or a number of establishments or local units. In many cases the ideal establishment does not have the necessary records, therefore the establishment is defined in operational terms as: the combination of activities and resources directed by a single owning or controlling entity toward the production of the most homogeneous group of goods or services usually

at one location but sometimes over a wider area, for which separate records are maintained. In the case of construction where the main activity is carried on at a construction site which is constantly changing, the ideal establishment or local unit as a statistical unit is not applicable. The International Recommendations on the 1963 World Programme of Basic Industrial Statistics suggested that no restriction should be placed on the location of the construction activity in defining the unit. A variety of units can however be distinguished. Some contractors will operate in connection with their construction activities from a fixed address which consists of an office only, and their only other activities will be on the construction sites. Others will in addition operate builders' yards for storage of plant, stores and repair depots. These may not be at the same address as the office although they may be in the same locality. Enterprises will frequently set up temporary offices on sites (and this may be for a period of years) and some enterprises will also have a number of permanent offices from which to organise their activities in different parts of the country. Taking into account the above perhaps it is possible to accept that in the construction industry the statistical unit can be the enterprise or the site or anything between these two. The use of the enterprise will not allow tabulation of the data according to location, but in many countries no records are kept which provide the data needed for enumerating any other unit than the enterprise. The use of the site may be feasible in some countries if their programme includes only a few items of data. The third possibility may arise in the case of enterprises operating from a number of permanent offices. In some countries these may be independent except for normal supervisory functions of head offices, i.e., they may have their own accounts, they may organise their own stores and plant depots, their own transport, etc. In such cases they could rank as separate units for the collection of most data, but the allocation of overhead costs from the head office would be likely to present problems, so that for questions of costs and of course for questions concerning legal organisation the units would have to be treated as one. It is however frequently the case that the head office of the large enterprise with more than the head office of the large enterprise with more than one office operates many of the major functions of the units' activities, for example, the preparation of tenders, the purchase and allocation

of major pieces of plant, and in such cases the unit from which data will have to be collected will be the permanent head office. Where separate offices are in operation, it might be possible to use these to facilitate the collection of data relating to the geographical distribution of construction activity. The fact is, however, that construction enterprises operate over varying distances from their permanent offices, and it is better to treat questions of this kind independently of the reporting unit.

Units with Ancillary Activities

3.7 Some enterprises, in addition to operating their own plant depots and stores, carry out ancillary activities such as the fabrication of joinery or of steel sections or of precast concrete units, or the quarrying of minerals which they require for their own use, or they may prefabricate whole buildings which they then erect. Such activities may or may not be included as an integral part of the activities of the enterprise itself. In case the data about these activities are included then the returns from the appropriate statistical unit, i.e., the head office of the construction undertaking will include all the data of these ancillary units.

3.8 In cases when enterprises which undertake construction carry out ancillary activities of this type and keep separate records for them, then it is desirable for most purposes to treat the production units as separate establishments and classify them to the appropriate industry group. Although if data are needed about the whole legal organisation, as they sometimes are, the whole enterprise would be the appropriate unit classified to construction if this were the main activity in terms of gross value of output (or in terms of the number of employees in the different activities, if output were not available). In practice, however, it is often impossible to collect data for many items separately from the production units. For example, if the production unit is small, as it often is, then output for use by the firm in its own construction may not be distinguished from output for sale. The men employed will be sometimes employed in activity concerned with the construction activities: much of the expenditure on fixed assets and stocks will be hard to distinguish. For example, transport vehicles will be used to move goods for sale as well as to construction sites. Except, therefore, when the accounting systems of the production units

of the enterprise are wholly independent, the only information which it is practical to obtain will be data on the goods sold. In effect these units are similar to enterprises carrying out more than one kind of economic activity at the same location, except that the construction activity is itself independent of location. In some countries these ancillary activities and units are treated as separate units only in cases when their production is used not only for the main unit's own construction activities but also for sale to other enterprises.

Part Time Units

3.9 The question arises of the treatment of units which operate on a part time basis. Such units may undertake both new construction as well as repair and maintenance work, and they may employ labour on a part time basis. In some countries they may make a substantial contribution to total construction activity. In Australia, for example, nearly half the dwellings were at one time built by owner builders. In most centrally planned economies, the members of agricultural cooperatives help in the construction work on their holdings. Where these part time units undertake new building it will normally be possible to identify them by means of administrative records and consequently the individual owner builder can be treated as the unit[1/]. Where they only undertake repair and maintenance their identification will usually be very difficult, and they will be excluded.

3.10 In most countries construction activity is undertaken by both general enterprises of builders or of civil engineers and enterprises which undertake only specialist activities, such as carpentry, plumbing and plastering. The definition of Division 4 makes it clear that all of these should be included in statistics of construction whether they are main or sub-contractors. About one third of the countries seek data in their basic enquiries about the major activity of the enterprises. There are however likely to be marginal differences of treatment between countries unless a more specific list of trades can be included. For example, should enterprises which undertake plant hiring for construction be included? Also, in Italy, enterprises

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1/ This conflicts with the recommendation in the International Recommendations in Basic Industrial Statistics that small or household units engaged in activity on their own account should be excluded from industrial surveys. (Statistical Papers, Series M, No. 17, Rev. 1, paragraph 10).

which undertake the installation of plant are included in the decennial census. Although units undertaking the construction of hydro-electric plants clearly come into construction, the definition used in Italy would seem to open a wider field. Although, therefore, the designation of the specialist enterprises will differ in different countries it would be helpful to have a list of these. Such a list could be expected to bring out differences of importance in the organisation of construction activity in different countries. (See para. 4.9).

Unit in Basic and Current Enquiries

3.11 In basic enquiries, whether they are carried out annually or less frequently, the appropriate statistical unit can be chosen according to para. 3.6. In cases when the unit is not the enterprise data may also be sought about combinations of these units into multi-unit enterprises, in which case a separate return may be required from the enterprise as a whole. This may or may not be classified to construction, according to the share of construction in the total output of the enterprise. In construction, enterprises sometimes unite into "consortia" for limited periods, often for the purpose of undertaking a particular contract. In such cases a special return will be required from the consortia. It will however usually be possible to separate the normal activities of the individual enterprises or units from their activities as part of the consortia. These benchmark enquiries will usually cover enquiries about the structure of the industry, employment, salaries and wages, and other input costs and output. Some countries however use them only as a means of obtaining a list of enterprises or units, and others only for data on employment which enables them to be used as frames for more detailed sample enquiries for other data.

3.12 In some countries the units used in basic enquiries are also used for current enquiries which usually relate mainly to data on employment and output, and sometimes also to data on capital expenditure and stocks. For example, quarterly or monthly figures of employment and construction are collected from enterprises in France, New Zealand, and in the United Kingdom. In a few countries only, including Sweden, Yugoslavia, the USSR and other centrally planned economy countries and the United Kingdom, are current statistics of construction output collected directly from the units or enterprises whose major activity is construction, although in some other countries, including Australia and the Netherlands, data for building output alone are collected in

this way. In many countries, however, current statistics are collected on a different basis.

3.13 The unit to be used for the collection of data from governmental or public authorities for both basic and current enquiries will depend on the organisation of the authorities. For example, in the case of local authorities the unit will be the individual authority. In some cases the organisation may be such that data will only be available from the head office. For example, the labour used on sites may be mobile, but even if it is not, the organisation may be run, as in the case of contractors, from the head office, and it may not be possible to allocate the resources to local units.

The Unit for Functional Enquiries

3.14 In many countries, largely because of the difficulty of identifying the continually changing universe of units in the construction industries, administrative records form the basis of statistical enquiries and in particular of current enquiries, and in such cases the unit frequently used is the individual project. The project can usually only be defined as the building or structure for which a permit or license is required, and in most countries it includes the erection of new buildings and major alterations and additions to buildings. Sometimes civil engineering structures are also covered by permits. These permits will usually relate to the whole of the development due to take place at the same time on a given site. They will not necessarily consist of a single building. For example, a development consisting of many dwellings either in multi or single dwelling units may be covered by one permit. They will also not necessarily be related to the placing of a contract with a single enterprise, and more than one contractor may work on one site at the same time, not only as sub-contractors but also independently. The development will in some cases be spread over time with different buildings being developed for example in succession. Data about these projects may be sought in two ways; either by the use of the administrative machine, as in the Netherlands, in New Zealand and in the United Kingdom, or by ascertaining the name of the contractors or authorities who are to be employed on the development as main contractors, and then as in Australia obtaining regular returns from them throughout the duration of their contracts. There are some advantages in collecting data on a project basis. As pointed out in para. 2.41 it readily permits geographical analysis of the location and

of the type of activity and also it tends to be simpler to collect some data on a project basis rather than on an enterprise or "establishment" basis, since the latter is likely to cover work on a number of projects being carried out at the same time.

3.15 There are however limitations to the data that can be collected on this basis. If the administrative machine is relied upon, this will normally be confined to the total value of the project and perhaps some analysis of its type and purpose and information in physical terms about the building. The data of starting and completing the project or parts of the project and the rate at which work is being done may enable the value of work put in place during a period to be estimated. It will be difficult to obtain any other data. If returns are obtained from the contractors or authority undertaking the work there will be no difficulty in ascertaining the value of work put in place and the number of men employed on the site may also be available (but not the number of men off the site, since these will be difficult to allocate unless the builder has only one project on hand). Main contractors have however to include information about the sub-contractors in respect of labour employed, and powers to obtain this kind of information about one enterprise from another are not necessarily available in every country. If main contractors are covering sub-contractors in their return it will be necessary, if the output statistics are to be used to provide data appropriate to Division 4, to see that separate information is obtained in respect of any construction being undertaken by industrial units or authorities whose main activity is classified to other divisions of industry (and which should therefore be excluded). As mentioned in para. 3.5, this may not be possible, although in some countries the problem does not arise.

3.16 Apart from limitations in the data which can be collected there are limits also in the field which can be covered as pointed out in para. 2.13. In most countries permits are not required in respect of projects below a certain size or below a certain value, and in many they are not required in every part of the country so that complete coverage of all projects is not possible from the administrative records and no other source of data is usually readily available. Moreover, if the system is to be restricted to building and not to the whole field covered by the permits, difficulties of definition arise, as in Australia, since permits are required for structures which are not

necessarily building and these have to be distinguished so that civil engineering projects can be omitted.

3.17 In practice, enquiries of this kind will rarely provide a basis for estimating the current construction output or employment in terms of activity units as defined by Division 4 of the International Standard Industrial Classification.

3.18 For the collection of current employment statistics use is frequently made of labour force surveys on a household basis. If they are suitably designed they can produce approximate data on employment relating to enterprises whose main activity is construction.

3.19 In Canada, where the collection of output data on construction is based on the collection of data on capital formation, the statistical unit used is in effect the persons, enterprises, or authorities paying for the construction. The returns obtained show the value of work paid for during a given period, with separate figures for payments made to contractors whose activities would be classified to Division 4 and for all other payments. At the same time data are collected on the payments made for repair and maintenance, analysed into the two groups. Figures of total construction output which can be analysed by purpose can in this way be estimated in respect of units whose main activity is construction. An institutional approach has to be adopted to provide other data.

Units to be included

(i) Coverage of Establishments or Enterprises

3.20 In most countries there are a large number of small enterprises employed on construction, and in some countries because there are so many of them they make a substantial contribution to total output and employment. In enquiries where data on total output and employment are to be sought or if data is required on the structure of the industry, the enquiry needs to cover them all, although it may be possible to include some of the smaller units on a sample basis once they have been identified. The great majority of the countries obtaining data of this kind do cover all the enterprises in the industry, both in basic enquiries and in current statistics, although the small enterprises do not always have to provide all the data sought from large enterprises (see following para.). In the remaining countries the cut off point varies. In their basic enquiries some, as

in Norway, exclude enterprises which do not employ labour. In a number of others, including many of the African ones, only enterprises with three or more, or with five or more employees are included.

3.21 In basic industrial enquiries of the kind envisaged in the International Recommendations on the 1963 World Programme of Basic Industrial Statistics data is expected to be obtained also on input costs, including expenditure on wages and salaries, on fixed assets, on stocks held, on electricity used, and on the sale of goods to others, and data on the capacity of power equipment and on plant holdings may also be required. The contribution made by the small enterprises in some of these fields of expenditure will generally be small and it should not be necessary to include questions on all these aspects in the returns they are asked to make, especially if the object is to collect data on the total expenditure of the industry. If however the object is to examine the structure and features of the industries themselves, then the data must be sought from a sample at least of the small enterprises. Many countries do ask for data in these fields.

3.22 In their basic enquiries most of the countries take full censuses. More than half include questions on legal organisation and many also include questions on the economic organisation or activity of the unit. Over half the countries seek some data on fixed assets and on stocks, and well over half seek data on materials and fuel purchased, many of them asking for data on specific materials and fuels. Some countries, including Rhodesia and the United Kingdom, restrict questions on capital expenditure to the larger enterprises. More than half the countries also include questions in some form or other on power equipment used, and the question is included in returns made by all of the enterprises in many cases.

3.23 Data of this kind is of course sought more often in enquiries made less frequently than annually, and the majority of the countries concerned include this data in decennial or quinquennial enquiries. For example, fewer than half of the sixteen countries with annual enquiries include questions on power in these enquiries, and in the countries making these annual enquiries the data is often not sought for the smaller enterprises.

3.24 Although it is desirable to seek much of the data required in basic enquiries from all the units whose main activity is construction, there may be considerable difficulties in identifying them. These

problems of identification are discussed in Chapter 6. In the case of governmental or public authorities there may be difficulty in deciding what share of the activities of the authority should be included in the enquiry.

(ii) Coverage of Projects

3.25 Because data on projects are usually based on administrative records, no difficulty usually arises in including in the enquiries the whole field covered by the records - which, as pointed out in para. 3.15, are usually deficient in some respects. However, this may not always be necessary. For example, in the Netherlands, where all but the smallest projects are covered by the administrative records, although data are collected for all the projects licensed, in the quarterly reports in which data on the value of work done and the number of men employed are sought, projects below a certain value are excluded on the grounds that they will usually be completed during a quarter and allowance can therefore be made for them without the need for a return. Similarly, in Australia, owner house builders are not asked to report progress every quarter.

3.26 In most countries seeking data by administrative methods on the number of buildings started or completed or in progress, the whole field is covered. But most of the data required have only to be collected once in respect of each project, and thereafter, analyses by type of building, method of construction etc. can be kept up-to-date without further enquiry. The rate of progress and the number of men employed in projects of the same value can vary widely. For example, a single house may be built in three months with eight men employed regularly on it - twelve months with only two men employed regularly. If data on employment or output on projects are being sought from builders therefore, all but the smallest schemes will need to be included, although it should be possible to cover the smallest schemes by sampling methods.

CHAPTER 4

DATA TO BE COLLECTED AND TABULATED AND FREQUENCY OF COLLECTION

A. BASIC ENQUIRIES

Units to be Included

4.1 The international recommendations on basic industrial statistics recommend that in infrequent enquiries in which comprehensive data on the characteristics and activities of industrial establishments are sought, all the units within the country in operation at the end of year and engaged in the appropriate activity should be included, and that in annual enquiries the smaller units as well as the larger should be included in important industries if there are few large units. In construction many businesses are not in operation the whole of a year, partly because of the seasonal nature of activity. If the characteristics of the industry are to be examined and understood it is essential that the enquiry should cover units active during any part of the year or some countries may choose the units active in the peak period, (e.g. in Europe in October). This presents difficulties, and the difficulties are greatest where seasonal problems, as in Finland for example, are greatest. Nevertheless, it is desirable that some method should be found of obtaining the minimum data from all the enterprises which have operated during the year. In annual enquiries this also applies, and although it is often not the case that there are few large units it is nevertheless usually true that a large share of the output is produced by the small enterprises and consequently all the establishments engaged in contract construction need to be included for the collection of some forms of data but not necessarily for all. This does not of course exclude priority being given to the collection of all data from the larger units but it does indicate the incompleteness of such data.

4.2 In the case of governmental authorities changes will be less frequent and the question of ceasing activity during a year will rarely arise, so that it may be sufficient to include only those in operation at the end of the year concerned. It may also be possible to exclude the smallest ones in annual enquiries without serious loss, especially in respect of some forms of data.

4.3 It follows from the nature of the industries that it will probably be helpful to ask for what proportion of the year units have been in operation, although because, for example, of changes in ownership such

data will need to be interpreted with care.

4.4 It is necessary here to mention the question of own account construction work. Depending on the principles of the classification scheme used this is in many cases classified to the appropriate industry groups (agriculture, mining, manufacturing, etc.). However for economic planning and for other reasons it may be that some items of data (employment, output, input) are required on this specific activity. In these cases these items can be enumerated, but should always be shown separately from the data on construction, and it has to be indicated clearly that these figures are already included in the appropriate industry i.e. according to the main activity of the statistical unit. The items which it is felt necessary to enumerate separately, will be dealt with later in this paper under the appropriate section.

Legal Organisation

4.5 The basic unit for enquiries into construction will be as indicated earlier the enterprise, the site unit or anything suitable between these two. But these units may be organised as individuals, as partnerships, as co-operatives, as companies or as corporations, and data on the legal organisation should be sought from contracting enterprises as for other industries. It may be helpful to add a class of owner builders in some countries. A separate class will be needed for governmental authorities and these should be divided according to the main function of the authority if more than one is concerned.

4.6 In case the unit is not the enterprise, then the units will also sometimes form part of organisations which undertake other forms of industrial activity, so forming a multi-unit legal entity. Information will sometimes be required of the whole entity, and where separate records are not kept the whole legal entity will have to be regarded as the unit although data on the activities covered by the unit will still need to be sought. Construction will sometimes be the major activity of such units and data will be required of the activities of the other units. A typical case will be the operation of property development as well as construction.

4.7 The collection of such data will enable data to be tabulated and published showing the total number of units, the number organised into different forms of organisation, and the number organised into groups,

with each of the more typical forms of allied activities. Such data should usually only be sought in the less frequent enquiries.

Geographical Distribution of Units

4.8 A local unit in construction has to be defined in terms of its permanent office. Although the construction activity may not be carried on in the same locality there will still be economic significance in an analysis of units by their permanent office. Many of the employees will live in the area and the profits, for example, will be accruing to units in the area and the appropriate local authorities in each country will therefore be interested in analyses of this kind. An analysis of the total number of units in suitable areas should therefore be carried out. It may not be desired to examine the legal organisation in this detail and analysis of much of the other data will only be of limited interest for publication, but the analyses will have to be made in order to arrive for example at the "value added" or net output of the units in the area. Enterprises with more than one permanent office and with separate records can be distinguished as separate local units and the total number of such units should be tabulated. Analysis of most of the data obtained from them will however usually have little significance on an area basis and is not therefore necessary to carry this out.

Economic Organisation

4.9 Only one group is defined in construction in Division 4 of the I.S.I.C. There are a number of ways in which the activity of units might be subdivided. One method would be to define the activity by the type of construction undertaken. For example, the major activity might be defined as the construction of (i) dwellings, (ii) other building, and (iii) civil engineering projects. Although some units would fall appropriately into such a grouping a large proportion of the units in most countries undertake work associated with each type of activity. Their major activity varies from time to time according to the demand for work and to classify them on this basis would therefore have little economic significance; a more detailed classification is needed.

4.10 A better alternative is to classify units according to the main type of work or trade which they undertake. The following classification is suggested.

(i) General Builders - to include units whose main activity is to carry out, or organise and partly carry out, whole building projects.

(ii) Civil Engineers to include units whose main activity is to carry out, or organise and partly carry out, whole civil engineering projects.

In countries where a large group of units undertake both activities a third group of (iii) Builders and Civil Engineers should be defined. In addition there should be a group of units classified to specialist "trades". In some countries such units are mostly "sub" contractors who sell their services to units in groups (i) to (iii), and in others where the organisation is different they are "main" contractors operating directly for the client purchasing the project. The following classifications are suggested in this group.

Carpenters and joiners
Bricklayers or block layers and masons
Concrete workers
Plasterers
Painters
Steel erectors
Electricians
Asphalt and tar sprayers
Slaters and tilers
Heating and ventilating system installation
Plumbers and glaziers
Demolition
Plant installation
Plant hirers
Dredging and pile driving

The same groups will not be appropriate in every country and a selection needs to be made. Additional groups may be required in some countries.

4.11 In some countries a distinction is also made according to whether the unit's main activity is as main contractor or as sub contractor. Where this is of economic significance the distinction should be made. But of course in many countries most of the enterprises are doing some work as the main contractor and other work as a sub-contractor. Therefore the classification of units according to this criteria may not be feasible. However the breakdown of work done according to this classification may be feasible and it will be considered later.

4.12 It is possible to classify units on the basis of the groups referred to in para. 4.10 (and perhaps para. 4.11) when they are first added to a list of units whose major activity is construction. Changes would occur because units change the scope of their activities, but it would

probably not be necessary to seek new information every time, even in the less frequent basic enquiries. The records could be checked intermittently. If, however, new lists of the units in construction are prepared for each enquiry by means of field surveys, for example, then new classifications would have to be obtained. (Because of frequent changes of address and even of title in construction units the comparison of different lists of units collected at different times or from different sources is a very difficult and cumbersome exercise unless the number of units is small).

4.13 Where such groups are distinguished all or most of the additional data collected from the enquiry should be analysed for each group. Such analyses will be of considerable interest to the groups themselves. It will also be of economic interest and of interest in international comparisons[1/].

Employment, Hours Worked, Wages and Salaries and Other Labour Costs

4.14 The table below sets out the data which, it is recommended in the International Recommendations in Basic Industrial Statistics, should be collected and published about employment and hours worked and earnings on the basis of annual and less frequent surveys.

Numbers Employed

4.15 The number of persons engaged is defined as the total number of persons who work in or for the statistical unit, including working proprietors and active business partners, unpaid family workers and employees. This definition presents no special problems in respect of construction and those employed by the enterprise both on and off all the construction sites covered by the unit quality for inclusion. Definitions of the persons to be included in classes 1(a) to 1(c) are given. In the case of the units of public authorities these may be persons who are concerned only part-time with the unit and part-time with other functions not concerned with industry. These will need to be treated as other part-time employees and classified to construction if this is their major activity. It may be necessary to enumerate the

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1/ The problem may arise with some of the "specialist" units and with units with ancillary activities (referred to in para. 3.7) that their major activity may sometimes lead to their being classified to construction Division 4, and sometimes to other divisions. In such cases if the change is known it is usually undesirable to make frequent changes in classification because it interferes with the continuity of the statistics. If, of course, the change in activity is very substantial, classification will have to be changed. A rule needs to be formulated to deal with such cases.

number of persons engaged on own account construction work in units classified to other industries. The persons engaged should be classified according to their major activity. Sometimes the operatives can be shown separately in the data covering the other industries. But in many cases (e.g. agriculture) because they shift rapidly from one kind of work to another even this is very difficult.

DATA TO BE GATHERED AND PUBLISHED ON EMPLOYMENT, HOURS WORKED, AND WAGES AND SALARIES

DATA TO BE GATHERED AND PUBLISHED	RECOMMENDED
1. Total number of persons engaged during a single period	X
(a) Number of working proprietors	X
(b) Number of unpaid family workers	X
(c) Number of employees	X
i. Operatives including apprentices	X
ii. Other employees	X
2. Number of employees engaged during specified periods of year. Total	X
(a) Operatives including apprentices	X
(b), Other employees	X
Derived from 1 and 2	
3. Average number of employees engaged during the year	X
4. Average number of persons engaged during the year	X
5. Number of man-hours worked by operatives during the year	X
6. Wages and salaries paid during year	
(a) to operatives	X
(b) to other employees	X

PROPOSED ADDITIONS

(a) 1/ Employees to be divided into on site and off site workers.

(b) 1/ Separate data to be collected for professional employees analysed by profession.

(c) 2/ Operatives to be divided into skilled and unskilled. Skilled employees to be divided by craft skill.

(d) 1/ Data on the apprentices according to the skill for which they are in training.

(e) 1/ Site employees to be divided according to type of construction.

1/ The number of persons engaged as at a specified date.

2/ Number of persons employed during specified periods or at specified dates of year.

4.16 It is recommended that the data collected for group 1(a) to 1(c) should distinguish between males and females and between adults and juveniles and that separate figures should be collected for (i) operatives and (ii) administrative, clerical and other employees, who are defined as "not directly engaged on the production or related activities of the unit". There may be difficulty in distinguishing operatives from other employees. All manual workers should be included under "operatives" including those engaged on plant driving, plant repair and maintenance, and men employed on transport for the unit. The status of site foremen may vary. On large projects they may rank as "Other" and on small projects as operatives. The question arises whether in the case of construction further analysis should be made of these latter two groups. The following suggestions should be considered.

Off Site and On Site Workers

4.17 A distinction could usefully be drawn between off site and on site workers (although there might be some persons who worked in both places.) When, moreover, there are sizeable production workshops for the production, for example, of joinery, of concrete products, etc., for the unit's own use or for sale in cases where separate units cannot be distinguished, such an analysis would be especially helpful. It might also be desirable to distinguish between persons employed off site in permanent offices in order to distinguish that part of the labour force directly associated with production. A broad analysis of this kind is provided in the Netherlands for example. It should apply to both the operatives and the other employees. An analysis of this kind would be needed for example for the investigation of productivity and of input costs and it would be of interest in international comparisons because it would reflect the organisation of the industry in different countries.

Professional Employees

4.18 Many enterprises employ architects, engineers, and other employees with professional qualifications. Consideration should be given to the need to ask enterprises to provide data about the number of their employees in these groups according to their profession. The classification may differ from country to country.

Skill of Operatives

4.19 Many countries distinguish between skilled and unskilled operatives because of the importance of the skilled labour force. Within the skilled class further distinctions are frequently made according to skill. The

following list indicates some of the skills common in different countries from which a selection could be made. Other classes would probably need to be added.

Carpenters	Tunnellers
Bricklayers	Welders
Painters	Concrete workers
Electricians	Bridge builders
Plumbers	Heating and ventilating engineers
Plasterers	Other skilled (to be defined)
Roof tilers	Semi-skilled
	Labourers

Data of this kind is collected for example in Australia, in New Zealand, in West Germany, in Hungary and in the United Kingdom.

Apprentices

4.20 Because the construction industry frequently trains its own skilled craftsmen on the site these will normally be included in the total employment figures. The maintenance of the skilled labour force depends on these apprentices and the collection of separate data for them should be considered. They need to be distinguished from other juvenile employees and according to the craft for which they are training, as in para. 4.19. These data are collected in a number of countries. They would only be required for a specified date in annual enquiries.

Analysis of operatives employed by type of product or of work

4.21 Construction activity covers many types of finished product, including housing; other forms of building of many kinds; civil engineering projects, such as bridges, dams, power stations; and repair and maintenance work. An analysis of the number of opratives employed in these types of work is needed for many purposes. The analyses that can be provided in different countries will vary, but a minimum division which might be considered would be

New Building, possibly separating employees on the construction of new dwellings and other new building
New Civil Engineering projects
Repair and Maintenance

It will sometimes be desired to analyse the above groups further according to type of ownership of the project whether public or private or co-operative, for example. However in most countries it is very difficult to enumerate these kinds of data. The same man can work on one day on new building, on next day on repair work etc. The operatives belonging to the same enterprise are often moved from one type of building to another. Therefore the enumeration usually needs to be confined to one specified day and it is difficult to use these

kinds of data for planning even if it is enumerated several times during the year.

4.22 To sum up, it is suggested that collection of the following additional data should be considered.

(i) Number of employees employed on or off site (or in permanent office).

(ii) Number of professional employees by profession.

(iii) Number of operatives, skilled and unskilled, the skilled divided by craft skill.

(iv) Number of apprentices analysed by craft skill for which they are training.

(v) Number of site employees in different types of work.

Most of these data would be appropriate to annual surveys and it will generally only be necessary to collect most of it for one period of the year, but if data on the number of employees on different types of work are collected separate figures would need to be collected for more than one period of the year if it were to be regarded as more than a general guide. (In practice some of this data is collected in some countries in current enquiries and then it is not sought in annual enquiries.)

Average Employment

4.23 Data on the total numbers employed are gathered for specified periods of the year. In view of the seasonal nature of employment in construction, countries not seeking current data should seek data in their annual enquiries if this is at all practicable for the average figures for each month of the year or for persons on the payroll in one week for each month of the year. It might be sufficient to obtain this in respect only of the number of operatives employed, since the seasonal changes in other employees are likely to be much smaller.

Size of Unit

4.24 As suggested in para. 4.13 above most of the data on employment can, when it is collected, be usefully analysed according to the classification of units. Moreover most of it should be collected in respect of the whole field covered by division 4, because of the importance of small units. Tabulations of data by size of unit should be based on all the persons engaged by the unit, including apprentices, and should, as in other industries, be based on 5, 10, 20, 50, 100, etc. persons. It may also be desirable in construction to distinguish units with no employees as there will often be a large number.

Manhours worked by operatives

4.25 No special problems arise in construction in respect of the definition of hours worked given in the international recommendations except that the term "waiting time" which is to be included may need to be more closely defined. The arrangements for paying men employed on construction stood off on account of weather will differ in different countries, but time paid for on this account should be included in the working hours. Time spent travelling to work may also be paid for in certain cases and such time too should be included. It might also be desirable to consider whether data on man-hours worked should be collected separately for off site and on site workers, since the former are not affected by weather. It will not usually be sufficient to have data on man hours worked for certain periods only since the seasonal nature of activity could make this misleading. However, it may be impractical especially in the case of the small units with poor recording systems to obtain other than limited data.

Wages and Salaries paid

4.26 In the international recommendations it is recommended that all payments in cash or in kind should be included in these figures. In the case of construction some of these forms of payment are more important than for operations in other industries - payment for travelling time, payment for lodging allowances, and any payments made for time stood off for weather all need to be included. It will often not be practical to distinguish payments for travelling time from the earnings and these should be included as well as payments for time stood off. Lodging allowance may be distinguished. It is for consideration whether or not they should be included in earnings.

4.27 The figures collected should distinguish between wages paid to operatives and salaries paid to all other persons. A distinction between persons employed on and off site may also be required if data on these groups are obtained. Analyses will not usually be required by type of skill, although if wage rates in the different categories vary this may be needed. Data may need to be collected separately for apprentices whose rates of pay will be lower.

4.28 It would be useful to have an analysis of the earnings of operatives by type of work so that if, for example, the other data is available, the net output per operative can be measured on different types of work.

Except however in the case of units which only undertake one class of work in the categories distinguished this will usually not be practical because the operatives are usually moved by the contractor from job to job during quite short periods. Separate data should be obtained for the earnings of men employed in ancillary units, particularly if these also produce goods for sale.

4.29 It has been suggested that separate figures of the deductions from pay made by the employer from the employee should be collected. This is of interest for purposes of social analyses. The deductions and the purposes for which they are used will vary widely in different countries, but it will generally be desirable to have separate figures for operatives and for other types of employees.

Other labour costs

4.30 Separate figures should also be collected for other labour costs so that the full cost of labour can be assessed. This includes the employers' contributions to pensions, social security schemes, protective clothing, etc. If lodging allowances are not included in earnings they need to be included in this category.

Data collected for individual projects

4.31 Most of the data discussed in para. 4.14 to 4.30 can only be collected from the permanent offices of construction units. Some countries however collect data on numbers employed on individual projects and in some countries this is their only source of employment data: such data will usually have to be confined to operatives on the site of the project since it would be difficult and cumbersome to allocate other employees. It might however be easier under this method to collect data on wages paid for particular projects, and although this would be incomplete it might be a useful guide to labour costs for different types of work. But in some cases the wage lists are prepared and kept by the head office or permanent office, therefore while it is possible to enumerate the number of persons employed by site on a specified date, it is usually not feasible to enumerate the wages.

Power Equipment Installed and other Plant and Vehicles in Use

4.32 Among the countries which have undertaken basic enquiries into construction a large proportion have included questions about power equipment, but almost without exception only in their less frequent surveys

or at infrequent intervals. The forms of questions vary - some ask about prime movers in use or in reserve, some about electric motors, distinguishing the source of energy used, some about electric generators. Where suitable data are collected the tabulations should follow the proposals in the international recommendations.

4.33 Some countries also seek data about the capacity of other plant and machinery in use and the number of vehicles of different sizes in use.

The types of plant for which data are collected vary in different countries but the following groups among others should be considered if these data are to be gathered.

Earth Moving Equipment
Cranes and Hoists
Ramming and Compacting Equipment including Roadrollers
Saws
Small Electric Tools
Tractors
Lorries

Methods of rating the different equipment will vary in different countries but tabulations will not usually be required for separate items in each group. The number of lorries may be much more important in some countries than in others. It depends on the organisation of the work, it may be that most of the transport is carried out by transport enterprises classified to the transport industry.

4.34 Generally it will be neither necessary or desirable to collect data on power equipment and plant from the smallest enterprises, as their use of it will be small.

EXPENDITURE ON FIXED ASSETS

4.35 About half the countries including construction in their basic enquiries seek data on expenditure on fixed assets by the units. This is generally sought in less frequent surveys. These surveys often exclude the smallest units, but where they do not, provision may be made for the small enterprises to be excluded from this part of the enquiry. Generally the data sought are figures of the value of capital expenditure during the enquiry year by type of asset, distinguishing new and used fixed assets, but in one or two countries data are only sought on expenditure on new plant: certainly many of the small enterprises with poor accounting systems will find it difficult to provide the data. This will especially be the case for construction work (or capital expenditure) undertaken on their

own account. This should be valued at the cost of the materials and labour together with the appropriate overheads, but the latter in particular may be difficult to estimate. The capital expenditure of the small units will however usually be small and there will be little loss in excluding them from the enquiry. Alternatively, the international recommendations suggest that capital expenditure data for the smallest units should only be collected if the expenditure represents purchases of new fixed assets from other establishments or, in the case of construction enterprises, other enterprises; so that data on expenditure on construction on their own account could be omitted.

4.36 Construction units will usually find it difficult to allocate expenditure on fixed assets if more than one statistical unit exists in the same enterprise, because the plant in particular will frequently be mobile throughout the area of operation, or throughout large and probably varying parts of it, depending on the plant.

4.37 It may be important if data on expenditure are being collected to gather also data on sales of fixed assets and in particular of plant, since these may be important where plant holdings are large.

4.38 When the data are collected tabulations should follow the proposals in the international recommendations.

STOCKS

4.39 Many countries including construction in their basic enquiries seek data about stocks, and in some cases separate data are sought in less frequent surveys for stocks of raw and auxiliary materials and for fuels. Such stock should include in the case of construction any plant, scaffolding or small tools which are not part of the capital assets of the units concerned. The smallest units covered by the enquiries are usually included in this item but in practice their contribution is likely to be small. In these enquiries the purpose for which the stock figures are required is important. Progress payments are frequently made by the building owner on materials purchased by the contractor before the materials are used. Some of the stocks will therefore not belong to the contractor. If therefore the data on stock changes which are required are obtained from the builder's accounts they show only the changes in value of stocks owned by the builder.

4.40 The international recommendations suggest that the value of construction work in progress but not completed should be excluded from the stock valuation. It is later suggested, however, that the

difference between the value of work in progress at the beginning and end of the year should be obtained together with the value of work completed (i.e., shipped) as a measure of work done, and that a comparison of the work in progress will measure the inventories of unfinished work held by the industry. In practice progress payments will have been made on much of the work in progress and it is the value of work in progress but not paid for which really represents the stock of work in progress of the construction unit. Similarly, part of the contractor's stocks will include work in progress for which he has paid a sub-contractor but on which he has not yet received payment. In practice, contractors' methods of dealing with payments for materials and for work in progress in their accounts will vary, and data on stock values need therefore to be both collected and treated with care.

4.41 Some countries further clarify the nature of work in progress. Actually it is of course possible to speak about finished and unfinished products (in the sense of completely finished buildings, construction work) but this is not sufficient because the unfinished products contain finished as well as unfinished constituent parts or work. E.g. a painting job with all the coats completed is finished work, but if only the base is prepared it is unfinished. This detailed breakdown is necessary because in these countries progress payments are made on the finished work but not on the unfinished, which means that the actual work done is the sum of the finished products, plus the value of the progress payment (made against finished work) and plus the change in the value of work in progress. This last item is in many cases so small that it can be omitted.

4.42 Data collected on fixed assets and on stocks should be tabulated according to the proposals in the international recommendations. Separate analyses for units in different economic groups would be of interest and these should also be published.

4.43 It is also suggested in the international recommendations that changes in the value of (construction) work in progress during the year could be added to the value of work completed (i.e. shipped) during the year for which payments have been posted to the capital account of the purchaser, not at the time when the progress payments have been made but only when the work was completed and delivered to the control of the purchaser. Unfortunately, the accounting methods adopted by different purchasers in the same country, like the methods

adopted by different construction enterprises, vary from unit to unit and figures of the value of work in progress are difficult to integrate with other figures for national account purposes.

Goods and Services Purchased

4.44 The goods purchased by contractors will consist of materials and components, fuels and electricity required for the operation of site (and off site) plant and transport vehicles, payment for the hiring of plant, small tools, and scaffolding and for transport, and finally the services of other contractors to undertake part of the construction.

i. Materials and Components

4.45 Many countries ask for data not only of the total value of materials and components purchased but also for details of both the quantity and the value of some of the more important materials used, including cement, bricks, timber, steel, and glass. Details may also be sought in respect of finished components such as doors, heating units, etc. The most suitable materials and components to select vary in different countries because methods of construction vary. In some countries the materials for which data are to be provided are optional, and data on the quantity and value of the "main" materials used are sought. Data of this kind are particularly useful in respect of materials such as steel paint and glass, which are used by other industries. As pointed out in para. 2.16 only by seeking data from construction units is it possible to ascertain the amount used for construction. Both the value and the quantity data will be of interest.

4.46 Such data can also be valuable if they can be obtained for different types of output, for example, separately for new dwellings, other new buildings - or for individual types of building - and for civil engineering projects, also possibly broken down into different types. A knowledge of how materials are being used makes it easier to estimate the future demand for them when building programmes are known. Data of this kind will, however, usually be difficult to obtain because many of the materials may be ordered in bulk and not assigned to individual projects. It will probably be more convenient to collect the data in respect of individual projects (see para. 4.31) rather than to collect these for construction units, which frequently undertake several types of work.

4.47 In some countries a distinction is drawn between the materials used which have been imported and those produced at home. These provide

data of the extent to which imported materials which are used by other industries are used for construction.

4.48 Most construction materials are delivered to the construction site by the merchant or producer supplying them, and transport costs will be included. They should be valued, therefore, at the price on site including the cost of transport, unless this is being paid separately. Materials should be regarded as purchased either when they arrive in the storage depot of the construction unit or on the construction site, this will generally coincide with the time at which they enter into the inventory account of the unit. Materials are frequently supplied free to construction units for inclusion in construction. This is particularly the case with work sub-contracted, for example. Such materials must be excluded from the data on materials purchased except by the unit which actually purchased them. In construction units which have ancillary production units which are not enumerated as separate establishments and which produce goods for sale as well as for use in the construction part of the unit's activities materials which are purchased for use in the manufacture of goods produced by this ancillary unit and used by the construction unit must be distinguished from materials purchased by the ancillary unit and used in goods sold. If this is not done the total production costs to be attributed to construction cannot be separated. This separation of costs may be difficult, therefore some countries are seeking other solutions. One way is to collect data on the total production (including the value of products made by ancillary units and sold) and on total material cost. Another solution is to treat - for internal use - this kind of ancillary unit as a separate unit and all the material produced by this unit and used on construction by the main establishment is treated as consumption of material for any cost analysis.

4.49 (ii) Fuels and Electricity and Other Goods Purchased

Many countries obtain data in their enquiries on fuel purchased, with separate details for different fuels and in particular for the consumption of electricity. Data are also sought on total purchases, with separate details for fuel for use in plant and for transport. A special category should be considered for construction to cover the purchases of small tools and plant which may rank as current expenditure but on which data will be of interest.

4.50 (iii) Service from Other Units and Establishments, and Hiring Plant and Equipment

In many countries much of the construction work is supervised by one unit with other units acting as sub-contractors, and the value of work sub-contracted will represent a large proportion of total purchases. It is therefore desirable to obtain separate data for this field of expenditure and in most countries where sub contracting is important this is done. Much of the work will be sub-contracted to other units classified to construction, but some may be sub-contracted to units in other industries. Expenditure on plant hire and the hire of scaffolding can be appropriately included in sub-contracting services if, as frequently happens, labour is supplied at the same time. The cost of transport services rendered by other units may also be included in this group and a special sub-division could be shown in cases where the item is of any importance. In addition to these a special category may be considered for services rendered by other units which are not construction units and for which labour is not supplied. In this category can be included the cost of hiring plant and scaffolding and vehicles.

4.51 Data on goods and services purchased are generally obtained in less frequent surveys, but some countries include them in annual surveys. The data are generally sought from all the units included in the enquiry. It might however be sufficient to obtain only the data on materials and components purchased from the smaller units, since their purchases of fuel and of other services, including sub-contracting, will usually (but not always) be small. Their usage of materials may be different from the larger units and it may therefore be important to include them in the enquiry, particularly if data are sought on the usage of materials for different types of construction.

4.52 It will be necessary to include the cost of repair and maintenance work done by the unit on its own account, both in buildings and on plant, including the cost of materials purchased for such work. If this is substantial it is clearly desirable that it should be treated as a separate item.

4.53 The tabulations proposed in the international recommendations should be provided when the appropriate data on goods and services purchased are available with special categories for hiring of plant etc. (as in para. 4.50).

Value of Work Done or of Output

Total Output

4.54 Many construction projects will be in progress for more than one year and the output has to be defined as the value of work put in place during the enquiry period. In the international recommendations it is suggested that three items of data should be gathered in order to obtain these figures:

(i) value of work in progress at the beginning of the year;

(ii) value of work in progress at the end of the year; and

(iii) value of work completed during the year.

Most of the countries which collect this form of data collect, however, only figures of the estimated value of work done during the year. In most countries construction contracts allow for progress payments on a monthly basis. The payments are based on the value of work carried out during the month, i.e., the proportion of the contract completed during the month. It is therefore a relatively simple matter if the contract price is known for the contractor to estimate the proportion and therefore the value of work he has carried out during the period. Alternatively, the value of work done may be estimated from the value of materials put in place, together with labour costs and other expenses, but in this case some allowance must be made in the expenses for the profit which is expected to accrue. This approach will be essential in cases where the contract price for individual projects is not fixed - for example, where the work is being done on the basis of cost to the construction unit plus a fixed fee. Another approach possible is for the price of the different kinds of work (digging, walling, painting, etc.) to be fixed and the value of the work done is estimated on the basis of the elements of the total project which can be considered finished work. Finished work in this connection is the same as defined under para. 4.41.

4.55 The question of dealing with work sub-contracted arises. In some countries the main contractor is asked to include in the value of work done the value of any work he has sub-contracted. It is argued that in this way the expenses incurred by the main contractor in respect of the work he sub-contracts are included in the total value of work done during the period, and the value of work done returned by main contractors covers the total output. In

other countries main contractors are asked to exclude the value of sub-contractors' work carried out during the period, and this is collected from the sub-contractor. This means that the value of sub-contracted work will have to be added to the value of work returned by the main contractor to arrive at the total output. Provided the main contractor includes in the value of work done which he reports an allowance for the expenses arising on his sub-contracted work, the total figures collected by the two methods will be the same. If the main contractor is asked to supply data separately for the value of services purchased from other construction enterprises and to include these purchases in the value of work done it should of course be possible to check this figure with the value of work done by sub-contractors and returned by them[1/].

4.56 These basic principles outlined in para. 4.55 can of course be applied to the compiling of the value of gross production in a variety of ways according to the purpose for which it is to be used. One purpose may be to analyse the cost structure of the industry in which case the units own production (i.e. carried out by own labour) should be enumerated. This includes the total value of work carried out by the unit as a main contractor (excluding the work given out to sub-contractors. and also all the work carried out by the unit as a sub-contractor. Another purpose may be the classification of construction activity according to type of construction (dwellings, schools, industrial building, dams, etc.). In this case it is better to enumerate the work given to the unit as a main contractor including the work given out by the unit to sub-contractors and leave out the work done by the unit as a sub-contractor, this latter of course being covered in some other main contractor's return.

4.57 Few countries seek data on the total value of work done or contracts completed during the enquiry year, although many ask for details of work completed when data are being sought in physical terms. This may be because the data in value terms do not have sufficient economic significance.

1/ The two sets of figures will not balance however if some of the work sub-contracted by the main contractors has been carried out by sub-contractors whose main activity is such that they are classified to other industries.

Sub-divisions of the Value of Work Done

(a) By Purpose which the Construction has to Serve

4.58 In most countries separate data will be needed for construction required for different purposes, but the detail sought varies considerably, and in many countries it is not sought through basic industrial enquiries but by means of administrative records and on a project basis and often of course in current enquiries (see Chapter 4, Section B.) If data of the latter kind are available then it may be considered sufficient to collect the total value of work done. A first stage beyond this would be to seek separate data on new construction work and on repair and maintenance, and it may assist the classification if data on repair and maintenance work are separated from work on major alterations and extensions. This will be helpful if production data are to be used for estimating capital expenditure in construction since major alterations and extensions rank as capital investment, whereas in many countries repair and maintenance do not. In many countries it will also be considered desirable to obtain, in addition, data for new residential building separately from other types of construction. Many countries divide other types of construction into building and civil engineering, but for some projects the distinction is far from clear. For example, power stations include buildings. If this distinction is drawn a precise list of what is to be included in each group is essential. Further analysis of the non-residential construction may be required, including divisions into factory building, office building, hospitals, schools, power stations, water supply, gas works, roads, etc. The importance of these different groups will vary in different countries, and the list should be adjusted accordingly. Headings which might be adopted for these data are given in para. 4.89.

(b) By Type of Ownership

4.59 If data are not available elsewhere, data of the value of work done according to ownership may be sought in basic enquiries. For example, separate data may be needed for ownership by central or by local government, by co-operatives, etc. In the case of private residential building it will frequently be difficult to collect data from any other source, and if data on private capital investment in dwellings are required separate data will have to be obtained in the enquiry.

(c) By Method of Construction and Material Used.

4.60 Data may sometimes be required on the method of construction: for example, the percentage of residential building built of blocks, or on the main materials used in the construction of buildings: for example, in the case of residential buildings, whether they are constructed in timber, steel, brick or concrete. Few countries at present collect this data but a number are now considering it.

Value of Work Done in Ancillary Units

4.61 When the construction unit has a production unit producing goods for use on the unit's own construction sites (see para. 3.7) the total value of the goods produced should be included in the value of output of the construction unit. It may be desired, however, to obtain separate data about the quantity and the value of these goods. As is pointed out in the international recommendations, this data may be required if, for example, the value of goods produced is substantial and they therefore could make an important contribution to the total value of such goods produced, although the greater proportion were being produced in units in other industries. These data should be kept separated from the value of construction output to avoid any duplication.

Value of Goods Sold

4.62 In most cases where goods are produced for sale in ancillary units as well as for use in the construction unit's own projects, separate data will be sought for goods of different kinds. The provision of the data will not usually present any difficulty.

Units to be Included

4.63 It will not usually be practical to exclude the small units from enquiries seeking data on the total value of work done, because they are likely to make a substantial contribution to the total. This is especially the case if separate data are required for certain fields of output. For example, the small builders will frequently undertake a large proportion of private residential building and of repair and maintenance work. It may however be possible to include these on a sample basis. To provide detailed data about the value of output however places a heavy burden on small construction units. This is particularly the case for small units and for the specialist enterprises, many of which will undertake work on a large number of projects during the enquiry year and where accounting systems may be poor. Whenever it is practical,

therefore, it is preferable to obtain detailed data of this kind by other means. Most countries do this. The output of the small units may be estimated by the help of the number of engaged and the level of productivity which possibly could be obtained by some sample inquiry. Other estimates may be based on the materials used by the small units. This can be calculated from, if it is available, the total building materials used in the country less that part used by the large enterprises. The tabulations should follow the international recommendations.

The Estimation of Value Added during the Enquiry Year

4.64 If data are collected about the gross value of output in terms of the value of work done during the enquiry year and of the purchases of goods and services the subtraction of the latter, with allowances for changes in stocks, will provide an estimate of the value added during the year. It should be noted, however, that a complete valuation of stocks will be needed for the purpose, including both those owned by the unit and those not owned by the unit (because progress payments have already been made on them). The value of the stocks on which progress payments have been made may well vary substantially at the beginning and end of the period so this factor cannot be ignored. The assumption is of course that the "value of work done" includes only the value of materials already put in place.

4.65 As the international recommendations point out, the data sought in these enquiries do not include some services purchased, such as advertising, legal and other services, so that the value added is only net in relation to the rest of industrial activity.

B. CURRENT ENQUIRIES

4.66 The data for which the current statistics should be collected falls in four main groups:

(i) Employment, hours worked, and earnings
(ii) Output
(iii) New orders
(iv) Capital expenditure and stocks

The field to be covered and the data which can be collected will depend partly on the method of collection adopted, i.e., whether from construction units or from administrative records using projects as units, and whether or not as part of functional enquiries. When the construction unit is used it may be used as both the reporting and the statistical unit or, as the reporting unit but with the construction project as the statistical

unit.

Employment, Hours Worked and Earnings

4.67 Even in countries where construction is not yet included in basic industrial enquiries current data are frequently sought about the numbers employed, hours worked and earnings. Recommendations have been made in this field at International Labour Conferences. For example, in the "International Standardisation of Labour Statistics" issued by the International Labour Office, reference is made to a resolution adopted by the Eighth International Conference of Labour Statisticians which sets out the employment statistics which should be collected for current data as follows:

> "Once each quarter the number of employees, with separate data for each industry in which as much as 5% of the country's total employment is found."

A convention on statistics of earnings and hours worked was adopted at the 24th Session of the International Labour Conference which says "statistics of average earnings and of hours actually worked ..... shall be compiled once every year and where possible at shorter intervals". Countries collecting this data on employment, hours worked, and earnings frequently do so as part of functional enquiries designed to collect data for the whole field of industrial activity, and sometimes they use the industrial establishment as the statistical unit and sometimes other sources. When the establishment is used the construction unit should be defined as in para. 3.6.

Employment

4.68 The minimum data collected should be the total number of employees, including both salaried employees and wage earners. The definition of employees should be similar to that used in basic enquiries, but data will not usually be required for persons other than employees since the numbers of these will not change frequently. It would be necessary, however, to include working proprietors also, who in construction are likely to go in and out of business over short intervals. If the statistics collected have to be based on the use of administrative records such as social insurance statistics it may well not be possible to include salaried employees since they may not be covered by the insurance scheme. Provided data are collected annually on the number of salaried employees this may not be a serious loss. In some countries sample household surveys are the main source of employment data. In this

case it may be difficult to distinguish those employed in the construction industry (as defined by Division 4) from those employed on construction work in other industries. This difficulty can be overcome if the household enquiries are supplemented by small sample enquiries from the construction industry, as these can be used to estimate changes in the level of employment in this section itself.

4.69 The frequency with which the data need to be collected will vary in different countries but, in more highly industrialised countries the data are often needed monthly. Other countries collect only quarterly, and some only half yearly, although in such cases it is desirable that data for each of the intervening months should be sought on the one return so that a monthly picture of employment can be built up in arrears. This is particularly desirable if estimates of changes in production are to be based on employment data. In view of the importance of the industry, monthly data are sought by countries which collect other employment statistics of industrial employment monthly.

4.70 The enquiry should cover all the units in construction, including those of governmental authorities, but in some countries the smallest units have to be excluded because of the difficulties of collection. If these small units cannot be included in current enquiries it is desirable that they should be included in annual enquiries because of their tendency to fluctuate in number. It will usually not be necessary to collect data for governmental authorities as frequently as from other sources because the number of employees is not likely to change substantially over short periods.

4.71 In addition to collecting data on total employment separate data may be needed for more detailed sectors of employment. The needs of different countries vary, but consideration should be given to the possibilities of collecting details of the number employed on different types of output. A minimum division might be for residential building, other building, civil engineering projects and repair and maintenance, as suggested in para. 4.21. It will of course only be practical to obtain this detail for employees on site and therefore it should be restricted to wage earners or operatives. In some countries the analysis is carried further and employment is analysed into as many as 10 or 15 different types of work, including, for example, hospitals, schools, churches, hotels, and power stations. Where public and private ownership

are both important it should be considered whether employment should be divided into these two sectors also for each type of output or in total.

4.72 The ease with which this more detailed data can be collected will depend on the method of collection. When the construction enterprise is the unit for collection the small units in particular may have difficulty in allocating their employees. If however data are collected from the construction enterprise but in respect of each project this difficulty is overcome. This kind of enumeration usually can refer to one specified day only. In most cases the average number may be enumerated for the whole construction unit only. Generally, however, whatever the method of collection it will be difficult to allocate off site employees, and in many current enquiries, although they should be included, they are in fact omitted. All employees in ancillary units which are classified to construction should also be covered if possible. The effect of any employees excluded needs to be examined if possible in the light of annual or less frequent enquiries which should cover the whole field.

4.73 Current enquiries will generally be on a sample basis and this will restrict the tabulations that can usefully be prepared. Analyses according to legal organisation will not usually be required. If the data are collected on a project basis and the sample on an area basis the geographical distribution of employment will be available, and tabulations for suitable areas should be provided for a limited number of types of output. An analysis for units according to their major activity (as defined in para. 4.9) will be of interest showing the number of employees in each group by the type of work on which they are engaged. Unless, however, the sampling error is small, analyses in this detail will be of little significance. Analyses by size of units should be considered, and if tabulations are provided they should be made in the groups proposed in para. 4.24.

4.74 It is doubtful whether the monthly production of detailed tabulations of this kind can be justified, but quarterly or half yearly ones can provide a useful economic background to activity. Tabulations should include separate analyses for any different governmental authorities which employ a significant proportion of employees.

Hours Worked and Earnings

4.75 It is usually only necessary to collect data on hours worked and on earnings at most quarterly, and in many countries half yearly collection is found to be sufficient. If the enquiry into hours worked and earnings forms part of the enquiry into employment it should be practicable to obtain parallel data. For example, data could be obtained for operatives employed in different types of work if the data are collected for individual projects. The amount of work involved in this is however likely to be excessive, and if such data are sought it could probably only be justified on a twice yearly basis at most. Similarly, if wage conditions vary for operatives with different skills data on the hours worked and earnings of different craftsmen might also be sought. The advantages of collecting such data at least twice a year are that it can disclose the seasonal pattern, provided appropriate periods are selected.

4.76 Household surveys will not usually be appropriate for surveys of hours worked and earnings, and data will have to be sought from construction units. Most current enquiries will be confined to total hours worked and earnings, but a distinction should be made between operatives (or wage earners) and salary earners. Since the latter will be subject to less variability, consideration should be given to omitting them from current enquiries and confining these to data about operatives. It should not then be necessary to distinguish between those employed in ancillary units or off site and those employed on construction sites. Whatever the data collected the tabulations should follow the pattern for employment as far as possible.

Output Data

4.77 A large number of countries now calculate index numbers of industrial production every month, or at least every quarter. The U.N. Statistical Commission has recommended that a general index should include construction and that a separate sub-index should be prepared for Division 4 of the I.S.I.C. Many countries use output data for these computations. (Some use man-hour data for the whole or part of the field covered.) It follows that in general current data about construction output is needed. However, only a few countries including the centrally planned economies are collecting monthly or quarterly data which can be used to estimate total production.

4.78 Those countries that do collect such data generally use the enterprise as the unit from which to collect them, unless they are making use of administrative records, in which case alternative methods of collection may be available. The cost of collecting such data is high, even though sampling techniques can generally be used, because of the number of small units which must generally be represented in the sample if the short-term changes in output measured are to be reliable. On the other hand it will not usually be sufficient to obtain data only about the total output during a period, and some analysis by type of product should also be obtained in order to calculate a reliable index of production. The minimum division which should be considered is the output of residential building, other new construction (which might as previously be divided into "other building" and "civil engineering"), and repair and maintenance. If the value of goods produced in ancillary production units for sale (not for use on the unit's own construction) represents a significant proportion of total construction output, it will be necessary also to provide for the collection of separate data for these units.

4.79 Greater detail in the data collected may be needed for administrative purposes, but its collection places a heavy burden on many small enterprises whose activity may fall in many fields, and it will be difficult to justify the collection of current data if the enterprise is the unit on which collection of the data is based.

4.80 When the output data collected are collected from construction enterprises on a project basis no difficulty arises in analysing the output into a large number of different types of work (as in para. 4.71).

4.81 Both the analyses and the tabulations for output data should be parallel to those proposed for employment data.

Data from Administrative Records

4.82 The source most commonly used in every country for data on current construction activity is administrative records which are available because of the need for construction projects to be covered by permits. The permits may be of different kinds. In some cases they are associated with planning and land development and in some countries they are issued as part of the control of construction operations. The limitations and advantages of using these permits are discussed in para. 2.40 et seq. and 3.15 et seq. In some countries for example permits are

only required for residential building and the data collected must be confined to this field.

4.83 The statistical unit used will generally have to be the project covered by the permit, which may vary from a single dwelling to a number of multi-storey buildings (see para. 3.25).

4.84 The data sought vary in different countries, but consideration should be given to the collection of the following[1/].

Data on Permits Issued

All Construction Projects

i. Type of work or kind of construction - residential, office, industrial, water works, etc.

ii. Value of project.

iii. Square metres or cubic metres of building.

iv. Name and address of owner and method of financing.

v. Name and address of contractor undertaking the work.

vi. Probable date of starting and duration of construction.

vii. Multi or single storey - number of storeys.

viii. Method of construction - either main materials or system used.

Residential Building Only

ix. Number of dwellings.

x. Number of rooms.

xi. Total floor space of dwellings.

xii. Equipment installed - piped water installation, toilets, baths, cooking stoves, etc.

In practice items (vii) and (viii) are at present usually sought only for residential building.

4.85 Once data of the kind listed above are obtained for a project and the permit has been issued it can be recorded, and when further data is sought on the individual projects it can be analysed under each head.

4.86 The data which it is suggested should be sought subsequently are:

i. whether the project has been started;

ii. whether the project is under construction;

iii. whether the project is completed, so that the date of completion can be recorded;

iv. the value of work done on the project;

v. the number of persons employed on the project, i.e., usually on the site.

1/ For definitions see: General Principle for a Housing Census. U.N. Statistical Papers, Series M. No. 28.

4.87 The method of collecting the initial data in different countries varies. Permits are usually issued by local authorities, and it will be most convenient if these summarise the data monthly or quarterly and make a return to the central government office responsible for collecting and analysing the data. Alternatively, copies of the individual permits may be sent to the central government office for recording and analysing. However it must be taken into consideration that many countries - especially in villages and rural areas - many buildings are built without permits.

4.88 The methods by which data relating to the permits can be conveniently collected also vary in different countries. Local authorities may be asked to follow up the projects and they may do this by a survey of building owners or alternatively their staff, for example the building inspector may report progress and estimate the value of work done on each project. If this is impracticable local authorities or building owners may be asked to make a return showing the "stage" or completion which has been reached, for example, 5%, 10% complete, and from the value of the project the value of work done during the period can be evaluated. In some countries the builder or construction unit is asked to make a return, in which case this part of the enquiry falls into the pattern of para. 4.67 et seq.

4.89 When data based on administrative records of this kind are available they can be analysed in a very large number of ways. In particular it has the advantage of enabling geographical analyses to be made. It is suggested that the following analyses should be made and published quarterly.

Type of Work

New Housing

Industrial and Factory Building

Commercial Building, including offices, shops and warehouses

Agriculture

Educational, including schools and places of higher education

Health

Religion

Hotels and Entertainment

Military (not included in capital formation)

If civil engineering projects are also covered, separate data for the following should also be shown.

Railways

Fuel and Power, including gas, coal, oil, and electric power

Marine Engineering

Roads and Highways

Water and Sewerage

Dams and Irrigation

Oil and Gas Well Drilling

4.90 The tabulations should include the number of projects in progress, together with a selection from the list of data given in para. 4.84 which is available for the country. For example, the total value of the project, the total area, the number of projects using different methods of construction. These should be analysed where appropriate into forms of ownership; public and private will generally be sufficient. The tabulations should show this data for a limited number of appropriate areas in the country concerned.

4.91 The data on the number of projects started and completed are also of interest and should be tabulated for the appropriate groups mentioned in para. 4.84 et seq.

4.92 For residential building additional tabulations should be made. The total number of dwellings should be shown with the average area and/or the average number of rooms and these should be analysed into type of buildings. A suitable grouping would be

dwellings in single storey buildings		
do.	2 - 5	do.
do.	5 - 10	do.
do.	10 or more	do.

It would also be useful to classify the buildings as to whether they are single-unit dwellings, two-unit dwellings, multi-unit dwellings. An analysis of the total number of dwellings built in each of the major methods of construction defined should also be made when the data are collected.

New Orders

4.93 Data on new orders provide a useful economic indicator of the future load of construction work and particularly in the private sector, this may be the only information available. Although these data are

rarely collected at present[1] consideration should be given to the possibility of including them in current enquiries. They could be conveniently included in an institutional enquiry into output and the new orders could be obtained for similar types of work. The enquiry should however cover only "new" work or new work including major alterations and conversions since most repair and maintenance work will be short term and orders will be executed within a month or two of being obtained. Enterprises which undertake only sub-contracting work should be excluded from the enquiry since the orders returned by the main contractor will include their orders. Even if it is not practicable to exclude sub-contractors the burden on small enterprises of making a nil return is not so onerous as that arising from enquiries into output data.

4.94 Unless the new orders are specified for individual projects a geographical analysis of their distribution will not be practicable. In countries where this is important the firms should be asked to specify the areas in which new projects are to be undertaken. In Canada forecasts of future capital expenditure on construction are usually obtained for each province. In the United Kingdom data on new orders are now being obtained in respect of every job with details of location and the type of work to which the project relates.

4.95 To some extent data on the number of buildings for which permits have been issued during a period are a guide to the future demand for building but as pointed out earlier these data rarely cover the whole construction field, and it is of course essential, in the case of non-residential buildings at least, to have data on the value of the projects if they are to be used for this purpose. Moreover, unless the data on permits issued are followed up to the "starting" stage they have to be treated with care since not only may the delay in starting be variable and substantial but some projects may be abandoned or indefinitely postponed.

Capital Expenditure and Stocks

4.96 Some countries include construction in functional current enquiries into capital expenditure and stocks where these data are required for national account purposes. Generally, data will only need to be sought from the larger firms and the large governmental authorities. Data on

1/ Data are collected monthly in Japan from large firms and quarterly in the United Kingdom.

capital expenditure should present no special problems except for the evaluation of construction work on own account (referred to in para. 4.35), but data on stocks will need careful collection and interpretation, as pointed out in para. 4.39 et seq.

CHAPTER 5

METHODS OF COMPILATION OF DERIVED MEASURES

INTRODUCTION

5.0 This chapter discusses the index numbers which may be derived from data on construction and methods by which index numbers of employment, of production, of prices and costs and of productivity can be calculated. Notes on the index numbers available in different countries are contained in Annex II(b) for employment and in Annex IV for prices and production.

INDEX NUMBERS OF EMPLOYMENT

5.1 Countries which collect current data on employment in construction will find it helpful to calculate index numbers of employment. These will show in a simple form the changes which are taking place and facilitate comparison with changes taking place in employment in other industries. In addition, they may be useful in the calculation of crude index numbers of productivity if index numbers of current production are available. If data are collected of the number of employees employed on different types of work or on different types of construction separate index numbers may be prepared for each. These will facilitate comparisons between the changes in employment occurring in the different sections of the construction industry.

5.2 The field covered by the index number should correspond with that defined by Division 4 of the I.S.I.C. if the index is to be used for international comparisons. For example, comparisons might be made of the seasonal effect on employment in different countries. If, therefore, the classification system adopted by the country differs from the I.S.I.C. provision should be made for the index number to be adjusted. In practice, differences in the coverage may not be significant as the pattern of employment in different parts of the field may be similar. In addition figures of numbers of employees will exclude the self-employed and in the construction industries these may be not only large in number but subject to substantial variation; attention should be drawn to any data that are available about the importance of this factor when index numbers of employment are published.

5.3 The index numbers should be calculated monthly if the data are available, using the average total number of employees in the year which is to be used as the base date. The index number for the first year may

then be expected to give some evidence of the seasonal pattern of employment unless substantial changes in the trend of employment were taking place. In practice, in the constructional industries, seasonally adjusted figures are likely to be of greater interest for the examination of trends because of the effect of weather on construction activity in many countries.

INDEX NUMBERS OF PRODUCTION

5.4 It was pointed out in paragraph 2.23 that a measure of the production of construction is needed both to measure changes in activity in the construction industry and to form part of a national index of production. Moreover, the Statistical Commission at its fifth session in May, 1950 adopted the following recommendation:

> i. Countries compiling index numbers of industrial production are recommended to cover the industries and trades making up the major groups 11 to 51 inclusive of the International Standard Industrial Classification of all Economic Activities. It is desirable that separate indexes of production be prepared for each of these major groups. When this is not practicable or justified by the importance of production in particular major groups, it is recommended that separate indexes be compiled for the following divisions:
>
> Mining and Quarrying
> Manufacturing
> Construction
> Electricity and Gas

It was also recommended that if the "construction" division were omitted this should be clearly stated. Other recommendations adopted were that the base-weighted (Laspeyres) formula should be used and that the index should be computed on the basis of rates of production per working week shown preferably for "months" (i.e., twelve times a year) or quarterly (i.e., four times a year.)

Coverage

5.5 Since the index number for construction is intended to form part of the total index of production it should, for purposes of international comparison, cover all activities classified to construction as defined in the I.S.I.C. and set out in paragraph 3.1. If the classification of industry used by the country concerned does not follow the international system then for its own purposes the country will want the index to include the units covered by its own particular classification system. Provision should however then be made to permit, as far as possible, international comparison. Whatever system of classification is used, if

overlapping is to be avoided, the field covered should not include construction activity carried out by units classified to other industry groups. This may however present difficulties in countries where the data are collected on a project basis, and more particularly in cases where the local authority, for example, acts as the collecting agent, since the production unit will not be identified. If, however, the production reported from these sources can be excluded from production reported by other units (i.e., units classified to other industries) there will be no duplication, and the error in classification is not likely to be large enough to be of prime importance. Alternatively, it may be possible in the enquiry to ascertain the source of the production, i.e., whether or not by units classified to construction. It has to be realised, however, that in countries where a substantial proportion of new construction is carried out by units classified to other industries, data collected from units in construction, of their total new construction output, will not be equal to total gross capital formation in construction.

5.6 The coverage may affect both the weight used for the index in measuring its contribution to the total index of production for all industries and also the changes measured. Generally, it will be more important to see that the weight attributed to construction is correct, and failure to cover the whole field in the measurement of changes in production or of covering a field which is too wide may be of less significance since it will often be reasonable to assume that the sectors omitted or the sectors which should have been excluded will be changing in the same way as the appropriate sector. Small errors in weighting do not however generally lead to any substantial error in the total index of production for all industries.

5.7 It is recommended in "Index Numbers of Industrial Production" Studies in Method, Series F, No. 1 (1950. XVII. 4) that in the case of construction, repair and maintenance should be included. In view of the difficulties in distinguishing some types of new work from maintenance, particularly, for example, in the case of road maintenance, which will include road widening, straightening etc., this is clearly desirable. It is not always practicable because many countries find greater difficulty in collecting data about some fields of maintenance activity.

5.8 As will be seen from Chapter 2 and Annex II, many countries do not yet collect current data for the whole of the construction field. Most

have some data about the production of dwellings, many on the whole of new building activity but excluding civil engineering and repair and maintenance. It is desirable to include in the index of production for all industries that part of the construction field which can be covered rather than to omit it altogether. Even the output of dwellings will usually make a substantial contribution to the total index. If this is done, the question will arise of what weight to attribute to dwellings, if, as may be the case, the total weight for construction is available annually or less frequently from a census of construction. This is bound to be a matter of judgement. In many countries investment in dwellings and in other forms of construction may well be moving in parallel, and the total weight could be used. In other countries different forms of investment will have priority at different times. In the more highly industrialised countries a good deal of social investment in water and sewerage, schools, hospitals, shops, will tend to be associated with housing, and it may therefore well be practicable to construct a reasonably reliable index from data on new dwellings only, or to increase the weight used with the index of current changes in the production of dwellings at least to cover a substantial part of the field of construction.

5.9 The field covered by the data should be representative of the whole output of that section of industry which is classified to construction. In most countries sampling methods are used for the collection of current statistics and the output of small units or of small projects may not be covered by the sample. The extent to which the exclusion of any parts of the total field affect the index can probably be estimated, and, if possible, allowance should be made for this. In many countries the current index numbers are adjusted annually in the light of data collected from an annual enquiry which covers the whole field.

Frequency

5.10 The frequency with which the index of production for construction is required may depend upon the frequency with which the index for all other industries is needed. Many countries do calculate this monthly and therefore data for construction are also needed monthly. This may however be impracticable in many countries and a quarterly index may have to suffice. If a quarterly index is to be incorporated into a monthly index for all other industries monthly figures will have to be computed. It will often

be possible to do this on the basis of more limited information - such as monthly data on total employment - which will frequently be available. In some countries the index number of construction production is not connected with the index number of industrial production, but calculated and published separately, therefore the frequency of calculation does not depend on the frequency of the calculation of the other industrial indexes. In this case usually the needs of the construction industry and the feasibility of providing suitable indicators are the decisive factors in deciding on frequency.

DEFINITION OF PRODUCTION

5.11 An index of production sets out to measure the changes in the output of an industry. This means ideally that it should be measured by the net output or "value added" by the industry, that is, the difference between the gross output (adjusted for changes in stocks and partly finished goods during the period) and the input of materials, products and services from other industries, in the case of value added. Net output means that the depreciation is deducted from the value added. If the index is to be reliable the changes in production of similar products must be compared. In construction this is a particularly difficult problem since most buildings are, as mentioned earlier, individual products, and are seldom repeated exactly. Although, therefore, no provision is made for subdivision of division 4 "construction" in the I.S.I.C. some breakdown is desirable for the construction of an index of production. The minimum subdivisions which should be considered are new housing, other new construction, and repair and maintenance, but many countries will also wish to divide other new construction, if the data are available, between work which is largely of a building nature, such as schools, offices, and hospitals, and work which is primarily civil engineering, such as roads, water, and sewerage. It may also be convenient to include with civil engineering the repair and maintenance work in civil engineering construction, since this is frequently difficult to distinguish from new work. The extent to which such subdivision can be used will depend on the data available and on the method of computing the index.

Calculating the Index

5.12 In effect the methods of measuring changes in the output of construction are attempts to measure changes in the aggregate of value added (or net output) in constant prices. This in itself is a difficult concept

to define, and it follows that the measurement of changes must by their nature be imprecise. The main methods used are discussed below.

Method 1. The Gross Value of Output at Constant Prices

5.13 In this method the gross value of output during the appropriate period is corrected for price changes and an index number of changes in the value of output at constant prices is calculated. This assumes, of course, that the value of gross output moves in parrallel with the value added or with the net output. Provided that index numbers of price changes for different types of construction are available and data are collected regularly of the gross value of output of work done for different types of construction this method presents no difficulty. The relationship between the value of gross output and the value added is likely to vary for different types of work and therefore any change in the proportion of different types of work could lead to a change in the total gross value of output which would not necessarily reflect any real change in production. It is therefore desirable in theory at least to calculate separate index numbers for all the different types of work for which the necessary data are available. This means that not only should separate index numbers be calculated for the subdivisions suggested in para. 5.11, but that in countries which collect data on a project basis separate index numbers should also be calculated for dwellings, hospitals, schools, power stations, roads, etc. In practice, the proportion of different types of work is unlikely to change rapadly because of the long term nature of most building projects, and, provided the base weights are changed at appropriate intervals, changes in the proportion of different types of work may not affect the measurement of production sufficiently to justify the calculation of a very large number of separate index numbers. Many countries with the necessary output data may not have separate price index numbers for a large number of different types of work. This may not be a critical factor however. The prices of all the different types of construction projects are affected mainly by the cost of labour and of materials, and, unless these move very differently and contribute very differently to total costs, the price of different types of building may not move very differently. In practice, however, most countries will be content with an analysis into three or four main types of work suggested in para. 5.11. Some of the centrally planned economies use fixed prices for the estimation of the index

number of construction production. The price of a unit of a particular kind of work or a particular element in the total construction (such as m^3 of brick wall, m^3 of earthwork etc.) is fixed and using a fixed percentage to allow for overhead costs and profits a fixed price for the whole construction project is calculated.

5.14 Ideally, the weights used with the index numbers for each type of work should be the values added or net outputs. These, however, will frequently not be available because a large proportion of enterprises will have projects including more than one type of work in progress at a given time, and will therefore find difficulty in providing data which analyses their overheads to individual projects or to individual types of work. It may be necessary therefore to use the gross output of each type of work at the base date to weight the changes in the value of each at constant prices in the calculation of the total index.

5.15 Methods of calculating output price index numbers for construction are discussed in para. 5.29 et seq. Consideration will need to be given to the extent to which these can be appropriately used for correcting data on gross output. Allowance may need to be made, for example, for the fact that materials may be purchased and stocked on the site well in advance of being put into place and included in the value of output for the period. Also, the value of work done during the period should represent the payment due to the contractor on its account: if the contract was let at a fixed price and the contract has been in progress for some time then the price index number to correct for price changes will need to take account of this. In practice, allowance may be made for factors of this kind by, for example, averaging the output price index over a suitable period or by producing a specially weighted price index number covering an appropriate period.

Method 2. Changes in Input

5.16 In this method the index number of production is calculated from estimates of changes in input. Changes may be measured in the input of materials or of man hours worked. If the method used depends on measuring changes in the input of materials the assumption is that changes in the value added or in net output are proportionate to changes in the input of materials. So long as the techniques and methods of construction of different types of work do not change this is likely to be true, but changes in the proportion of prefabrication off site by other industries would, for example, invalidate the assumption. Many

countries collect current data of the deliveries of a wide range of materials and components. The data will rarely be comprehensive but they will frequently cover the basic construction materials and account for well over half of the total value of materials used in construction. Moreover, the usage of materials for which data are not collected may perhaps be expected to be proportionate to the usage of those for which data are available. The data may be collected in terms of value or of quantities. For this purpose quantities are preferable as they can then be evaluated at constant prices, but if data on the value of materials are collected they will need to be corrected for price changes. The materials delivered in a given period will not necessarily be equal to the materials used in the same period since contractors' stocks of materials may be changing. The long-term trend in production is not likely to be invalidated by this factor but if corrections are needed for short-term trends it might be possible to carry out a sample enquiry among contractors to ascertain their changes in stocks. Quite a small sample might be sufficient since the factors affecting stock changes are likely to be common to most units.

5.17 The quantity of materials used for different types of work will vary so that ideally, as in the case of Method 1, separate index numbers should be calculated for different types of construction. In practice the delivery of materials for different types of construction will rarely be available and a simple index number is likely to be all that can be calculated. This should not introduce a serious error since, as mentioned in para. 5.13, the proportion of different types of construction is not likely to change rapidly. The question of weights for the calculation of the total index of production for construction will only arise if data are available on the value of materials (at constant prices) used for different types of work. The appropriate weights would be the value added at the base date for each type of construction, but if these are not available the gross output should be used, and if this also is not available the value of some element of the input used for each type of work at the base date (at base date prices) should be used. The choice of weights is not likely to make any very significant difference to the index unless production in some sectors is moving very differently from that in others. In particular, for example, the usage of materials for repair work tends to be low and the value added

h h. If therefore the value of materials used on repair work were used to weight the movement of changes in the production of repair work, and if the latter were stable while the output of other types of work was increasing rapidly, the affect could be to make the changes in the index of total production for construction substantially too high.

5.18 If changes in man hours worked are to be used as a measure of changes in production, the assumption is that these changes are proportionate to changes in the value added or net output of construction. Production will however depend also on output per man and allowance should therefore be made for changes in productivity. Changes in productivity may in turn be associated with changes in overheads such as plant costs, so that changes in man hours even when allowance is made for changes in output per man will not be a reliable measure of changes in production if techniques are changing rapidly. In practice they are not likely to do so. Methods of measuring changes in productivity are discussed in para. 5.53 et seq. Since changes in productivity may not be taking place very rapidly it may be sufficient to allow for these annually on the basis of data collected from an annual census. Alternatively, changes in productivity could be interpolated for each month or quarter of the year on the assumption that these had taken place at a constant rate, and the index numbers of production for construction could be corrected in arrears when the annual data were available.

5.19 It is again desirable that separate index numbers of production should be calculated for different types of construction since changes in productivity and techniques are likely to be taking place more rapidly in some types of construction than in others. In practice, the collection of data on changes in man hours employed on different types of work presents difficulties because many contractors undertake work on many types of buildings and construction. Measures of changes in productivity for different types of construction are less likely to be available if only data on man hours are usually collected and not data on the value of work done, and a single index number may be all that can be calculated.

5.20 If the necessary data are available to permit the calculation of separate index numbers for different types of construction the choice is similar to that in the case of calculations based on the input of materials, and if no other weights are available the man hours input at

the base date for each type of construction should be used. In practice the man hours input is likely to be more closely related to net output than the quantity of materials used, so that the use of man hours as a weighting factor may be less likely to introduce errors in the total index of production for construction than the use of materials input. Alternatively, in case the sum of the wages and salaries is available for the different types of construction (or at least the wages of operatives) then this could be used for weighting.

Method 3.

5.21 The value added (or net output) index can also be determined by a direct method. This will actually show at constant prices that part of the G.D.P. or net material product produced by the construction industry. In this case the Geary formula is used, which means that in both the base period and current period the value added (or net output) is calculated as the difference between gross output and input at constant prices and the ratio of these two differences will give the index. For this calculation it is necessary to have gross output and input for both periods and two price indexes one for the output and the other for the input.

Method 4. Physical Measures of Output

5.22 In some countries the only data available about construction are in terms of physical units. There are likely to be serious limitations in using these as a basis for measuring changes in production but if no alternative is available consideration should be given to their use. The simplest example is likely to be data about the construction of dwellings. If the number of dwellings started and completed each month or each quarter is available then a current index of production for dwellings could be derived. It would be necessary to make allowance for the number of houses under construction at the beginning and end of the period and for the amount of work done on them. Errors in this allowance could lead to serious errors in the short term movement of the index of production calculation but not in the long term movement. The index number would only be reliable if the size of the value added included in the value of the "average" dwelling were not changing significantly. In practice this might well be the case during a given year. If data were available annually of the total value added of housing construction (at constant prices) this would enable

a calculation of the "average" value added per dwelling to be made. If changes had occurred it could be assumed that they had taken place at a steady rate throughout the year and the current index of production for housing could be revised in arrears if this seemed necessary.

5.23 Data on the number of other types of building or civil engineering projects are not likely to be of any help because the structures would vary too much, but sometimes the floor area or the cubic capacity of buildings started and completed in a period may be available and these could be used in the same way as the number of dwellings. The index number of production will be more reliable, although it will at best be very imprecise, if the data can be separately analysed for different types of building such as cubic metres of factory buildings, of schools, of shops, etc., since the volume of building work or the value added per unit of area or of volume in different types of building is likely to differ even more substantially than in buildings of the same type.

5.24 If data are available to permit the use in the calculation of the index of production of physical measures for more than one type of construction, then as in the methods described above the appropriate weights for calculating the total index would be the total value added of each type of construction at the base date. However, sometimes the value added is not available but if the average prices of each unit of construction product (e.g. m^2 of floor space of dwellings) are gathered, gross output weights can be used. If no other data are available the area or volume of building at the base date would have to be used, but it is not likely to be a very reliable guide to the value added, and if production of different types of building were moving very differently the index of production calculated could be very inaccurate. Another possibility of using data expressed in physical units is the use of data on different kinds of works or elements (m^2 earthwork, m^3 of walls, m^2 of roads of definite kind etc.). To enumerate this kind of data is difficult but some countries are making experiments in this field. The indexes resulting from these basic indicators can then be combined using as weights cost data or the number of man hours worked.

Using more than one method of calculation

5.25 It may sometimes be convenient to use one method of calculation for one part of the construction field and another method for another part. If this is done care is necessary to ensure that the fields covered are complementary and do not overlap otherwise errors may be intrcduced in

the total index number: it will often be impossible to ensure this as the data will come from different sources, and a single method will have to be used.

5.26 None of the methods proposed can be expected to provide a very exact measure of changes in production of construction: the conceptual difficulties are too large. In addition, however, the problem of allowing for changes in "quality" is probably greater than that for other industries. If it is practicable, there is much to be said for calculating index numbers by each of the methods for which data are available and examining the differences. Each method suffers from different defects and it should be possible to arrive at a more reliable estimate by examining the different estimates. For example, if method 1, based on the gross value of output, is used there is a danger, as pointed out in paragraph 5.16, that the greater use of industrialized methods of construction making use of structural units prefabricated off the site and often by other industries may lead to the changes in production measured being too large. This should of course be corrected by changes in the price index for materials purchased, but a comparison with calculations based on the man hours employed and changes in productivity might be expected to indicate the presence of factors of this kind and enable a choice to be made between different methods. If however more than one method of calculation is to be used to derive either a total index or index numbers for different types of work, care must be taken to ensure that the calculations are independent. For example, if method 1. is used but the price index is based on estimates of changes in labour productivity (see para. 5.57 et seq.) and the estimated change in production is compared with an index of changes in man hours adjusted for changes in productivity, the two estimates may both be dependent on the same index of productivity and therefore one method may add nothing to the other.

International Comparison

5.27 The method by which index numbers of production are calculated in most cases will not affect the validity of international comparisons provided the fields covered are broadly similar and the index numbers reasonable reliable. If short term comparisons are to be made then seasonally adjusted index numbers will be required because the extent to which the output of construction is affected by seasonal factors varies in different countries. Comparisons of the changes in the index numbers of different countries will show the rate of change taking place in output.

5.28 Comparison of the actual level of output between countries is a far more difficult process than the comparison of the rate of change in output. In principle the following methods can be considered:

(a) Output expressed in value corrected by a price index between the two countries.

(b) Number of man hours worked corrected by the difference in labour productivity.

(c) Measurement in physical units of the finished products.

(d) Comparing the consumption of materials in physical units.

All these methods in practice are complicated and their use involves the solution of a large number of problems.

INDEX NUMBERS OF PRICES AND COSTS

5.29 Reference was made in para. 2.24 et seq. to the need for index numbers of the cost of construction, and in para. 5.13 et seq. to the use of such index numbers for adjusting the gross value of output to constant prices in connection with the calculation of index numbers of production for construction. There are conceptual difficulties in comparisons of the price of construction as there are in measuring changes in output. Although to the client purchasing a building the price is the price he pays for it, since to a large extent each project is individual, a comparison of the prices paid by different clients provides no basis for measuring changes in costs. This problem inevitably affects the methods by which index numbers of prices can be calculated.

Coverage

5.30 The price index numbers should cover the whole field of construction covered by the output classified to the industry group and the need has been stressed for separate price index numbers for different types of construction. To meet the minimum proposals put forward for measuring changes in production when method 1.is to be used, separate price index numbers are required for new housing, other new building, and repair and maintenance, and possibly also for civil engineering work, including both new work and repair. If more detailed data are available for the output of different types of work then additional price index numbers will be needed. In any case these will be of general economic interest. In addition, a composite index should be calculated. This may be for all

new construction or for all construction including repairs and maintenance work. Whichever is selected the calculation should be based on a weighted index of the Paasche form using as weights the gross value of output of each type of construction at the current date. In many cases, owing to the difficulty of quickly obtaining current weights, it will be necessary for an interim period to use Laspeyre's base weighted index.

Frequency

5.31 Since the price index numbers for construction should form part of the whole economic assessment of changes in the level of prices they will probably be required monthly, but measures of changes in building prices are not likely to be sufficiently sensitive to justify monthly calculation and quarterly calculation should be adequate. If it were desired to incorporate the quarterly index number into a monthly series of index numbers, in, for example, a monthly price index number for capital goods it would be possible to interpolate in the quarterly figures and assume that changes had taken place steadily throughout the quarter or to make some alternative assumption if the data available indicated that this was more probable.

Methods of Calculation

5.32 Three main methods can be used for the calculation of output prices.

i. The same construction project can be repriced for each period.

ii. "Measured quantities" of construction work can be repriced for different periods and suitably weighted; these can be aggregated to form index numbers for different types of building.

iii. Changes in the input prices can be weighted and suitably adjusted for changes in profits to form a price index number.

The three methods are discussed below.

Method 1. Repricing the Same Building

5.33 For this method a specification is prepared for a number of standard construction units, for example, for a standard residential building, a standard factory, a standard school, a mile of standard road. Depending on the organisation of the construction industries in the country, either enterprises of quantity surveyors or of consulting engineers (who are responsible for preparing estimates of the cost of the projects for their clients) or contracting enterprises can be asked to quote a price for each of the standard projects at the base date and at quarterly or

suitable intervals thereafter. Because the prices quoted by different enterprises are likely to be different and to change differently it will be necessary to ask a number of enterprises to price each project at the base date and to reprice it every time the index number is to be calculated. From the price data the average price can be derived and an index based on this average price can be calculated. To arrive at the "total" price index the index numbers of each "standard" project will be weighted by the gross output of construction which the standard represents in the total. Because the factors affecting different enterprises may differ so widely, unless a very large number of price quotations are obtained the price movements of each of the standard construction units are more likely to reflect random variations than "true" changes in price. Moreover, since there may be regional variation in prices the data will have to be collected from contractors operating in representative parts of the country. The method suffers from the disadvantage that the exercise is artificial, since the contractor quoting a price is not being asked to erect the project at the price quoted. In practice, the price a contractor quotes for a project depends on the location of the site, the extent to which he wants the job - and this in turn may depend on whether machinery belonging to the enterprise will be idle if he does not get it, and on many other factors. In addition, the specification is itself artificial since the aim is to make the standard project as near average as possible, and it may then be quite artificial in the sense that the specification of the average project may not be typical of any particular project. Moreover, there is no easy method of arriving at what the "standard" specification should be. In practice, architects and engineers will be asked to prepare suitable specifications, but it will usually be only a matter of judgement whether these represent typical average projects in the field they cover.

5.34 In the case of residential buildings there tends to be more repetition of, if not exactly similar structures, structures which are relatively similar. If therefore the data are collected of the prices quoted for similar residential buildings, for example, with the same number of rooms, and the average is derived, this should form a basis for the calculation of a price index number for the price of housing. The difficulty in this case is that changes in quality, including changes in size, in the fitments included etc., in the average number of dwellings included in a contract, can all affect the price, and the measurement of

the effect of these factors is very difficult. It may in practice be better to analyse the price of the dwellings into prices per square metre or per cubic metre if these data are available, and it may then be practicable to adjust the prices per square or per cubic metre to allow for certain factors if their effect on price is known. This however again introduces an element of artificiality into the data and is likely to affect the reliability of the index as a measure of changes in the price of construction. It is of course also essential that the prices of the residential buildings should exclude the cost of land.

5.35 The cost of repricing "standard" units of construction every quarter is likely to be high, especially if a larger number of quotations have to be obtained for each unit. While therefore it is true that the price movements of different types of construction are likely to be different it will generally be impracticable to prepare separate price index numbers for more than three or four types of construction. These will have to be selected so as to represent price movements in the types of construction for which output data are available, and the selection will have to be a matter of judgement in each country.

Method 2. Repricing Measured Quantities of Work

5.36 This method is similar to the previous one except that instead of repricing "standard" projects measured quantities of the constituent elements of construction work are repriced. A contractor in arriving at the price which he quotes for a project analyses the scheme into standard units of work; for example into square metres of brickwork of a given thickness, the removal of cubic metres of topsoil, the windows and standard accessories and their fitting. Each of these standard units is priced, the price including materials, labour, and an appropriate allowance for overheads and profits, and to arrive at the price quoted for the whole project the standard price is multiplied by the total number of units of each type which will be required for the construction of the project. For a typical project such as a single dwelling some 500 units of work may have to be priced. Many of the units of work are however typical processes required for all forms of construction. For example, the erection of shuttering will be required for most forms of concrete structures. The data collected on the prices for different units of work are therefore more flexible in use than data for whole structures.

5.37 As in the case of the previous method of calculation, either specifications of "standard" units have to be prepared or weights have to be obtained for the "units of work" for which data are supplied. This presents difficulties, since the necessary basic information must be collected before the specification can be prepared. The advantage of this method is that because it permits a wider use of the data collected it should not be necessary to collect data from as many enterprises, and it is possible, if "standard" units of construction are used, to introduce a new unit without necessarily requiring any additional data. On the other hand, it is not possible to collect data for all the units of work that are priced when the contractor is working out the price he will quote for a project. A compromise has to be reached between the number of items covered and the number of contractors from whom data are sought. Unless however the items for which price data are collected contribute about 70 per cent to 80 per cent to the total cost of the project the price index is not likely to be reliable, since the price movement of different units of work is likely to vary significantly.

5.38 In West Germany, where this method is being used, data are being sought quarterly for 120 items or work categories from 1,200 contractors. Some work done in Great Britain illustrates the need to obtain unit prices from a large number of contractors since the coefficient of variance calculated for certain unit prices quoted by different enterprises for blocks of flats was as high as 30 per cent.

5.39 In collecting the data care has to be taken to ensure that all the costs appropriate to the measured units of work are included in the prices quoted. Many contractors allow a varying percentage for contingencies when they have priced all the units of work in a project. Unless this is properly distributed throughout the units of work for which prices are collected, and clearly there are problems in doing this, the index derived could be quite unreliable as a measure of price changes.

5.40 There is, as in the case of method 1, a certain artificiality about the exercise, although its reliability may well vary in different countries. For example, the price quoted for part of the project may depend on the use of plant and this may be put in below cost if the alternative is to have it standing idle. In addition, in some countries when variations are made in the specification of a contract, variations in the price agreed are based on an estimate of the price of the standard units of work affected by the alteration. If such alterations are expected the price

quoted may well be based on a high price for these items. This enables the contractor to quote a low price for the project as a whole and then as a result of variations in the high priced items receive a much higher price with a larger profit element. When data are sought from a contractor for the price of standard units of work he may therefore have difficulty in deciding what his current rates are.

Method 3. Changes in Input Prices

5.41 The price of a structure is made up of the cost of materials, of labour, of overheads, which includes all other costs, and of profits; and the third method of measuring changes depends on estimating changes in each of these constituent costs and weighting them appropriately so as to derive an index of construction prices. The philosophy behind this approach is that if the proportion of materials, of labour and of overheads and profits in a structure are similar then the average "units" of construction produced are similar. Changes in the price of the constituent items are unlikely to be exactly similar and they will vary for different types of construction, also the proportion of total costs represented by the constituent items is likely to vary so that, as in the case of other methods, separate price index numbers need to be calculated for different types of construction. Index numbers for each of the items will need to be weighted for each type of work according to its share in the total costs at the base date. There are therefore two problems - to calculate index numbers to show changes in the price of the three items and to ascertain suitable weights to allocate to each item in order to calculate each final price index. The index numbers will take the form:

$$I_C = W_1 I_M + W_2 \frac{I_E}{I_P} + W_3 I_O$$

where I_C is the index number of costs for each type of construction
I_M is the index number of materials costs
I_E is the index number of earnings
I_P is the index number of productivity
I_O is the index number of overheads and profits
and W_1, W_2 and W_3 are weights for the constituent items of materials, labour costs and overheads and profits respectively, and $W_1 + W_2 + W_3 = 1$.

The data concerning the structure of the cost elements and also the costs themselves usually might be collected from the statistical units - usually enterprises. Therefore although it is possible to utilise groupings of the enterprises themselves in many countries it is not possible to compute from these data the costs for different types of construction.

(i) Index Numbers of Construction Materials Prices

5.42 Index numbers of the price of construction materials are collected in a large number of countries. These usually cover all the basic materials and are likely to represent 70 per cent to 80 per cent or more of all the materials used in construction. Provided the quantity of each material used in the period under consideration is known and can be used to calculate suitable weights, and provided that data of the prices of materials delivered to site can be collected regularly from producers, price relatives can be calculated and the calculation of a single price index presents no problems. In order to calculate separate price index numbers for different types of construction quantity of materials used for each of them will be needed in order to provide suitable weights. This may be difficult and it will usually be impracticable to go beyond the minimum divisions required for the calculation of the index of production as suggested in para. 5.11. If output data are collected on a project basis it may be possible to take a sample of projects for each type of construction for which price index numbers are required and from a special enquiry to ascertain the proportion of different materials used.

(ii) Index Numbers of Labour Costs

5.43 The cost of labour depends on both earnings and productivity. If data on average earnings per month or per quarter (if the index is required quarterly) are collected, an index of earnings can be constructed. To correct this for changes in output per man this must be divided by an index of productivity. The measurement of changes in productivity is discussed in para. 5.57 et seq.

5.44 It will often be difficult to collect separate data for earnings for different types of work since contractors will tend to be asked to supply data for the whole of their wage bill irrespective of the work on which the labour is employed. If it is practicable, separate index numbers of earnings should be calculated for at least the three or four types of work needed for calculating the index of production

and referred to in para. 5.8. An enquiry into changes in average earnings for different types of construction might be made on a project basis as suggested for materials in para. 5.42 above, but the enquiry would need to be made regularly to provide up to date figures of the changes. If it is not practicable to collect separate data for different types of work a single index of earnings will have to be used. This may not introduce any serious error as average earnings on different types of construction may move at the same rate but factors such as different amounts of overtime worked at higher rates of pay will affect this. In any case, separate index numbers for productivity may not be available for different types of construction. However, in either case there will be advantages in using any separate data which are available.

(iii) Index Numbers of Overheads and Profits

5.45 The field to be covered in this series depends on the field covered by the other two index numbers. If for example the earnings data available relate only to those paid to operatives, then changes in salaries paid to all other employees will have to be included in overheads and profits. In addition other costs such as social insurance and other labour "on costs" will have to be included as well as the depreciation and running costs of plant and other depreciation costs.

5.46 If the share of total costs that is represented by overheads and profits at the base date is known and changes in the proportion can be calculated an index of overheads and profits can be derived. Generally it will be difficult to determine what changes are taking place every quarter but it may be possible to obtain data from annual or less frequent censuses. For the purpose of calculating the current price index an assumption must therefore be made about the changes that are taking place. This assumption should be based on past experience.

5.47 It may be assumed in some cases that overheads and profits change at the same rate as the cost of materials and labour together if past experience has suggested that this is a reasonable assumption. In this case overheads and profits can, in fact, be ignored in calculating the final price index number for construction. Alternatively, it can be assumed that they change at the same rate as total costs, i.e., that they remain a constant proportion of total costs and also of turnovers. In some countries the prices quoted for projects are based on the assumption that overheads and profits are a fixed proportion of total costs although the proportion is varied with the type of work, and this

assumption will be preferred in these countries. Whichever assumption is made it can be varied to allow for changes which are known to be occurring if this seems necessary. For example, if substantial increases were made in social insurance costs these might be expected to increase overheads, or alternatively profits might be expected to rise if competition were less keen and the allowance for overheads and profits could be adjusted accordingly. The practices adopted in different countries vary, but the assumptions made can be tested out whenever suitable data such as that obtainable in a census are available. Adjustments can be made in arrears to the price index numbers calculated if desired. Although the share of total costs represented by overheads and profits is likely to vary for different types of work it will probably be necessary to make the same assumption about changes in their "price" for each type of construction for which an index is to be calculated unless data available from other sources or past experience suggest that the assumption needs qualifying in any individual case.

5.48 In many countries supplementary data on profits in relation to total costs or turnover are available annually from taxation records and the index of overheads and profits can be adjusted in the light of these data if changes are occurring. Data are unlikely to be available for individual types of construction because the contractor's profits will be on his total turnover and most contractors will undertake a number of different types of construction.

5.49 Overheads and profits will frequently only account at most for 20 per cent of total costs. Even a 10 per cent error in the index of changes will not therefore have a very substantial effect on the final price index for construction costs.

5.50 It has to be realised that it is desirable that the proportion of costs to be attributed to overheads and profits should be obtained from contracts for projects being currently let. Data obtained in a census will represent the proportion for all the projects in progress during the year and these may have been let at fixed prices under varying conditions. The data represent therefore the average for all those projects but are not necessarily appropriate to current costs.

(iv) Calculation of the Weights for Each Constituent Item

5.51 The weights for each item must be derived from census enquiries or from special enquiries of the type referred to in paras. 5.42 and 5.44. If special enquiries can be carried out it will be possible to arrive at

separate weights for each of the constituent costs for a variety of types of construction. The object should be to obtain them at least for each of the three or four types of construction suggested as necessary for the calculation of an index of production. If it is not possible to derive appropriate weights for different types of construction a single price index will have to suffice.

Comparison of the Three Methods

5.52 Most countries which are able to calculate price index numbers for construction will adopt one of the three methods discussed depending on the data that are available or that can be collected. Comparisons between the results of the three methods are unlikely to be made, but there are in fact differences in timing. In Methods 1 and 2 the prices quoted for the standard buildings and the measured quantities of work will presumably be based on the prices that the contractor would quote if he were asked to quote for the project at the date at which he submits his returns. If therefore he knows that the prices of materials or wage rates are going to increase he would allow for this in his price. In Method 3 the price index number for materials and for labour costs relates to current costs and no allowance is made for future changes even if these are known to be in prospect. The index number provided by this method is therefore more strictly an index of current prices although the price index used for overheads and profits may not be appropriate to current prices. The price index numbers derived by Methods 1 and 2 might be termed "tender" price index numbers. It follows that if the price index numbers are to be used for correcting data on output so as to arrive at output at constant prices for the measurement of changes in production the adjustments necessary to the price index numbers will depend on the method by which they have been derived.

Method 4.

5.53 In addition to the three methods described reference is made in para. 5.65 to another method which can be used in association with the measurement of changes in productivity.

Quality Changes

5.54 As in the calculation of other price index number series, changes in the quality of "construction" present problems, whichever method of measuring price changes in used. In practice it will be very difficult to determine all the changes that are occurring. For example, a higher standard of workmanship may lead to a fall in productivity but it will be

almcst impossible to obtain any measure of such changes. Substantial changes in the use of different materials for a particular type of construction work, for example an increased use of plasterboard to replace plaster in housing, would indicate a change in the end product. Allowance could be made for changes of this kind which are known to be occurring in the same way as they are made in other price index number series. If technical developments are taking place rapidly there might be much to be said for frequent revision of the "standards" used for the first two methods of calculation and for recalculating the materials price index numbers and the weight if the third method is being used.

5.55 Of the methods described Method 3 is likely to be more readily adaptable to the measurement of changes in the prices of civil engineering because it will often be possible to estimate the weights of the three constituent items for all civil engineering at the base date but difficult to determine the suitable standard projects required for the other two methods. It should be practicable, however, to make estimates for some items such as miles of road, the laying of pipes and other well defined fields. Similarly, the difficulties of measuring changes in the price of repair and maintenance work may present greater difficulty than the measurement of price changes for new building but again certain well defined fields may be able to be covered. The advantage of Method 3 for calculating price changes is that the average "structures" can be defined by the weights of the constituent items even though the interpretation of this average may not be known.

INPUT PRICE INDEX NUMBERS

5.56 In addition to the output price index numbers referred to above it may be desired to calculate input price index numbers or index numbers of costs. If both series are available the difference between the two series could be used to calculate the changes in profitability. In many countries price index numbers using Method 3 are calculated on the basis of changes in the prices of materials and wages weighted according to their proportion in the total cost. Separate index numbers may be calculated for different types of construction. Such indexes do not allow for changes in the price of overheads but if it can be assumed that these change proportionately with other costs then the index numbers derived are in effect input price index numbers.

INDEX NUMBERS OF PRODUCTIVITY

5.57 Reference was made in para. 2.26 to the need for index numbers of productivity as a guide to the rate of change in efficiency in the construction industry, useful both in the country concerned and for international comparisons. In addition, if changes in production are to be measured by the input of man hours (see Method 2 para. 5.18 et seq.) a measure of changes in productivity is required as an adjusting factor and if changes in the price of building are to be measured by changes in input prices (see Method 3 para. 5.41 et seq.) a measure of changes in productivity is needed to arrive at changes in the cost of labour.

Coverage

5.58 The index numbers should as in the case of index numbers of production cover all activities classified to construction. In practice, provided the major part of the field defined by the I.S.I.C. division 4 is covered, the index numbers are likely to be adequate for purposes of international comparison and as guides to changes in efficiency in the industry. When the index numbers are to be used in connection with the measurement of changes in production or prices care must be taken to see that the appropriate field is covered. If, for example, measures of production in price index numbers are to include repair and maintenance it will be essential that the index numbers of productivity cover this field also.

Frequency

5.59 The frequency with which index numbers of productivity can be provided will depend on the data available. In many countries the calculations will depend on data collected only annually and if an index number is required more frequently for the calculation of index numbers of production or of prices it will be necessary either to extrapolate on past trends and if necessary to adjust the index numbers when the data for the subsequent year become available or to assume that changes during the year are not significant. Generally, it will be better to adopt some method of smoothing the changes throughout the year. If the necessary data are available to enable calculations to be made half-yearly or quarterly the index numbers should be obtained. It is doubtful whether the calculation of a monthly index could be justified in view of the imprecise nature of the measurement.

Measuring changes in productivity

5.60 Index numbers of productivity should measure changes in production per man and the problems that arise in defining and measuring changes in

production in construction referred to in para. 5.11 arise equally in respect of changes in productivity.

5.61 It is desirable that the index numbers should be based on a comparison of like products and this means that separate index numbers should be calculated for different types of construction. The minimum analysis for consideration would be that defined in para. 5.11 for index numbers of production and if a total index number is required the appropriate weights would be the total value added for each type of construction at the base date, if these data are available. The methods of calculation are discussed below.

Methods of calculation

5.62 If separate index numbers of production are available for different types of work and the data on employment for each type of work are available index numbers of productivity can be directly derived. If the production index numbers are calculated quarterly then employment data may only be available for one month in the quarter and it may be desirable to interpolate the figures for the intervening two months in order to arrive at a better average. Consideration will have to be given to the purpose for which the index numbers are required when deciding whether to measure changes in productivity in terms of total employment or of operatives only. Often, especially if, for example, the data on output and employment are collected on a project basis, the data for different types of work will relate only to site labour, and productivity will have to be measured in terms of site operative labour. In any case this is the appropriate index if a measure of productivity is required for the adjustment of operatives' earnings to arrive at a measure of labour costs for a price index number for construction.

5.63 It will not be appropriate to use this method of calculating an index of productivity if the index of production itself depends on a measure of changes in productivity either directly as in the case of the use of the total man hours input adjusted for changes in productivity or indirectly when the price index used for adjusting the value of output to constant prices depends on a measure of changes in productivity. In such cases it may be possible to make use of changes in the value of materials used per man (at constant prices) on different types of work to provide an index number of productivity. Even, however, where the total value of materials used on construction is available at constant prices, data are unlikely to be available for different types of construction because, as already pointed out, most contractors will undertake more than one type of construction and the data they supply on materials will

cover all of them. It may be possible however to estimate the figures. If data are available of the gross value of output at current prices and of the number of men required to produce that output, then output per man at current prices can be derived. If the average earnings per man are known for the period to which the output relates and if an estimate can be made of the overheads and profits that should be deducted the total value of materials used per man can be obtained by deduction of the other two quantities. Thus if at the base date

V_n is the average value of output per man month

E_n is the average earnings per man month

a_n is the proportion of V_n represented by overheads and profits

M_n is the average value of materials used per man month

then $V_n - E_n - a_n V_n = M_n$ and at $n + 1$ months

$V_{n+1} - E_{n+1} - a_{n+1} V_{n+1} = M_{n+1}$ all at current prices

M_{n+1} can then be corrected to M_n the value of materials used per man at base date prices provided that an index number of building material prices is available. The index of productivity is then

$$I_p = \frac{M_{n+1}}{M_n} \times 100$$

5.64 It is desirable that when this method is used, as in other cases, separate index numbers of productivity should be calculated for different types of construction and this may be difficult because separate data for earnings on different types of construction may not be available. The error introduced into the index numbers of productivity if the same data are used for average earnings for each type of construction may not be serious however since it may be reasonable to assume that average earnings will change relatively similarly even though the actual level is not known. If this is not a reasonable assumption it may be possible to make some adjustment.

Method of successive approximation

5.65 A method of determining changes in productivity which is associated with the method of measuring changes in construction prices has been used in Hungary. The method assumes that changes in value added are equivalent to changes in total output. In order to apply the method it is necessary to have an analysis of total costs into materials, wages and other costs both at the base date and at each successive date for which the index of

productivity is required. This can be conveniently expressed in terms of output per man. Then as in para. 5.64 above the value of materials used at dates after the base can be corrected for price changes and the resulting value of output provides a crude measure of changes in production per man i.e. of productivity. The total output is not however corrected for price changes resulting from changes in earnings per unit of output. A cost index is constructed using the index of productivity obtained and the cost index is then used to correct the changes in productivity derived from the initial calculation. The process is continued until both the price index number derived and the index number of productivity cease to show any marked change with successive adjustments.

Using index numbers of productivity

5.66 If index numbers of productivity derived from current statistics are to be used in connection with the preparation of index numbers of the price of construction by Method 3, it is probably desirable to average the index numbers of productivity over a period or to use a trend figure. It is unlikely that short-term changes in productivity would in practice affect the price of building although they might lead to short term increases or reductions in profitability. But since it will usually be necessary to use trend figures or average figures for profitability it is better to treat the productivity factor in the same way.

CHAPTER 6

METHODS OF GATHERING PRIMARY DATA

6.1 For the purposes of collecting statistics, construction activity can, in most countries, be divided into three groups - construction undertaken by

i. private bodies whose main activity is construction so that they are classified to Division 4 of the I.S.I.C;

ii. governmental bodies whose activities in construction are also classified to Division 4; and

iii. other private bodies whose main activity is classified to other Divisions of the classification.

Most countries experience little difficulty in enumerating governmental authorities and in collecting some information from them, and the main problem arises in collecting information from private bodies.

6.2 When information about the structure of the construction industry is required, or about the type of ownership, or about activity etc. in relation to other industries, the statistics should ideally be based on the collection of information from the enterprises or other units which make up the industry. If, however, data are required for example about the location of activity, statistics may be better collected in respect of individual projects. These may be collected from the enterprises or from the individual projects, or from other units. Alternatively, if information is wanted concerning the amount of construction in the total capital formation in the economy, statistics may be better collected from the persons or bodies responsible for paying for the construction.

Identifying Enterprises in the Construction Industry

6.3 In many countries there are substantial difficulties in preparing a complete list of the enterprises or other units which undertake construction work. The site on which the main activity takes place is constantly changing, so that while an enterprise usually operates from a fixed address, there is little difficulty in changing this and frequent changes occur. In addition, many small units come in and go out of business over very short intervals, so that the list is subject to constant change. Such small units frequently operate from their home address and this makes them difficult to identify. An ideal solution might be the compulsory "registration" of enterprises undertaking construction. Such a system was in operation in Great Britain, for example, between 1940 and 1953. There would, however, be difficulties in enforcement.

In centrally planned economies most of the construction units are state owned or cooperatives, which are known. But the problems of identifying enterprises whose main activity is classified to divisions other than construction, and the self-employed are similar to those in the market economies.

6.4 The sources used in different countries are given in Annex Ia and Annex III. In some countries use is made of taxation registers. If facilities exist this might be a profitable source in other countries. Use is also made of lists of members of employers' federations and of insurance agencies, and in some cases lists obtained in connection with social or general welfare purposes are available. Some countries use field surveys when a census of population is being carried out. In those countries where permits or licenses have to be obtained before construction projects can be started the applicants for the permit can be asked to show the name and address of the enterprise undertaking the work, and either a copy of the application is sent to the government authority responsible for preparing the list of enterprises or the authority which collects the application is instructed to prepare a list. Permits are, however, often required only for new construction and often only for new construction over a certain value. The list is therefore unlikely to be complete. Moreover, in countries where the system of working is such that much of the work is sub-contracted to other enterprises it will usually be impossible to do more than obtain a list of "main" contractors . The difficulty could be overcome if "main" contractors were asked to list the names and addresses of their sub-contractors, but the necessary powers to obtain this kind of information probably do not often exist.

6.5 In practice almost all direct methods other than those which make use of compulsory powers such as those relying on taxation registers are likely to produce lists which are deficient to some degree, and supplementary methods of survey will need to be introduced. In particular this is the case if it is desired to collect information about repair and maintenance work. Supplementary sources of information used in many countries include published lists such as telephone and other directories, advertisements and field canvassing. The latter is not easy because there may be no evidence of the activity of an enterprise operating from a home address. This could be overcome by canvassing the sites on which operations are in progress, but again this is only practicable if the site of activity is visible from outside, and in the case of much repair and maintenance work it will not be.

6.6 Problems arise when lists are derived from more than one source because enterprises frequently operate under more than one name and from more than one address, or the address may not be sufficiently precise to make the identity of two enterprises clear. Considerable care is needed therefore if duplication is to be avoided. The difficulties of obtaining a complete list of enterprises are clear, and complete coverage, in particular of units which undertake only repair and maintenance work, may be impossible without an expenditure of money and effort which cannot be justified by the results. If, however, this conclusion is reached there is always a risk of serious omissions from the statistics. Moreover, since many enterprises start by undertaking repair and maintenance work and graduate to other types of work the tracing of such enterprises helps also to maintain the register of larger enterprises undertaking new construction.

Identifying the Location of Activity

6.7 Because of the movement of construction activity from site to site the location of the enterprises or other units in the industry is no guide to the location of activity. It is possible to obtain information about the location of their activity from the units if a list of these exists but this can be a very onerous burden since many units will be working at the same time on a large number of sites. If in addition a large number of units are active on the same site the collation of the statistics can be burdensome not only to the units but also to the authority responsible for dealing with the returns.

6.8 In a very large number of countries permits have to be obtained before new construction can begin and many make use of this fact in order to obtain information of serveral kinds about the location and progress of construction (as well as using it as a method of obtaining information about enterprises as described in 6.4). Permits are most frequently required for the construction of dwellings but sometimes also for other building and also for other types of construction.

6.9 The information most frequently obtained in this way is about the number of projects started, but in addition many countries use data obtained from permits of this kind as a basis for their current statistics on construction activities. In such cases data are usually obtained about both the number and the value of the projects completed but sometimes also about the proportion of completion at different times during

the duration of the project. In addition to obtaining information about the number of projects and their value details are sometimes obtained in this way of the physical space provided by new building.

6.10 The information required is frequently collected by the local authority which has to submit returns to the appropriate central authority. Data of this kind can readily be analysed by location. If, as frequently happens, the whole of the field concerned is not covered by the permit system, supplementary enquiries have to be made, usually by means of field surveys. This system of collecting information is particularly helpful in countries where a substantial number of dwellings are built by owner occupiers. This type of activity cannot be covered at all by statistics collected from units in the construction industry.

Household Surveys

6.11 In some countries, especially those in which other sources are not available, use is made of household surveys as a means of collecting certain construction statistics. This method is used especially for the collection of figures of expenditure on repair and maintenance, although it will not always provide information which is relevant only to the field covered by Division 4 of the I.S.I.C. because of the work done by householders themselves. It is also used sometimes for the collection of figures of employment and earnings in construction.

Surveys of Capital Expenditure on Construction

6.12 In Canada the approach to statistics of construction is by way of capital formation in construction. In this case the information required is collected from all the industries covered by the I.S.I.C. but the resulting data relate to the whole field of construction and not just to the construction industry as defined by Division 4.

Census and Sample Enquiries

6.13 Although a full census of the construction industry (i.e., a survey of all the units covered by the definition) will usually be expensive, it may be necessary to undertake it more frequently than with other industries. This is so because frequent surveys enable the register or list of firms to be kept up to date more readily and it may be more costly to undertake a complete enumeration de novo at longer intervals. Full census enquiries will usually be undertaken by mail, but when questionnaires are elaborate

or too difficult for the respondents to complete without help the best procedure may be to obtain the simplest information about employment for example, and to use sampling procedures making use of field survey methods for all other data.

6.14 In the case of the construction industry the techniques of list and area sampling will frequently be complementary and multi-phase methods of sampling may be appropriate. The list survey can be used to obtain a probability sample, and then in order to examine the reliability of the list, area samples might also be undertaken by means of field canvassing. The latter may also be helpful in respect of non-returns. Because enterprises so frequently go in and out of business in construction, it is important to establish the reason for non-returns, otherwise a register may get very out of date and the allowance made for such cases may be very incorrect. Visits to a sample of the "non-return" units will provide a valuable check on the position.

6.15 Although in most enquiries all the large units will need to be included, a sample of the small units will also normally be required because of the substantial part they usually play in the whole field of activity.

6.16 Methods of aerial survey have been used in the U.S.A. as a method of identifying sites where construction was in progress. They proved costly however, and have been at present abandoned.

ANNEX Ia

COVERAGE, SOURCE OF INFORMATION AND REPORTING UNIT FOR BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Frequency	Coverage (Size of Reporting Unit)	Source of Information			Reporting Unit		Data Sought on	
			Direct Collection		Administrative Records	Establishment or site unit	Enterprise or other multi-establishment unit	Legal Organization	Economic Organization
			Census	Sample					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Algeria Industrial Census	Annual	All	X				X		
2 Argentina National Mining, Industrial and Commercial Census (Special form for construction)	Decennial	All units	X				X	X	X
3 Austria Non-agricultural Establishment Census	Decennial	All units	X		Taxation Records		X	X	X
4 Belgium Census of Industry and Commerce	Decennial	a) Units with 1 or more employees b) Units with no employees	X X				X X	X X	
5. Brazil Industrial Census (Special form for construction)	Decennial	All units	X				X	X	X
6 Bulgaria Statistical Returns, Industry*	Annual								
7. Cameroon Inquiry into Activity of Enterprises*	1957								
8 Canada Survey of construction	Annual	All units		X[1]	National Revenue Records				
Capital Expenditure Survey	Annual	All units	X	X		X		X	
9. Ceylon Census of Industry	Decennial	Units with 5 or more employed, or capital of at least 3,000 rupees, or mechanical power used.	X				X	X	X
10. China, (Taiwan) Census of Industry (Special form for construction)		All units	X				X	X	
11. Cyprus Census of Industrial production	Quadrennial	All units[2]	X[2]	X[2]			X		
12. Czechoslovakia Statistical Returns, Construction	Annual	All units	X			X			
13 Denmark Establishment Census	Decennial	All units	X				X	X	X
14. El Salvador Industrial and Commercial Census (Separate form for construction)	1961	a) Units with 5 or more engaged b) Units with 4 or less engaged	X *	 *			X X	X X	
15 Ethiopia Industrial Census	Annual	Units with 5 or more employees[3]	X				X		
16. Finland General Census of Business Establishments	Decennial	a) Units with 2 or more employed b) Units with 1 or less employed Joint stock companies	X X X				X X X	X	X X
Inquiry into Companies	Annual								

ANNEX Ia (cont'd)

COVERAGE, SOURCE OF INFORMATION AND REPORTING UNIT FOR BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Frequency	Coverage (Size of Reporting Unit)	Source of Information			Reporting Unit		Data Sought on	
			Direct Collection		Administrative Records	Establishment or site unit	Enterprise or other multi-establishment unit	Legal Organization	Economic Organization
			Census	Sample					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
17 France									
Industrial Census (Enterprises of Building and Public Works)	Annual	a) Units with 200 or more employees	X		Treasury and social security records processed by National Statistical Institute		X	X	X
		b) Units with 20 to 199 employees	X				X	X	
		c) Units with less than 20 employees	X				X	X	
18. Germany, Eastern									
Industrial Statistics*	Annual								
19. Germany, Fed Rep. of									
Non-agricultural Establishment Census	Decennial	All	X				X	X	X
Handicraft Census	Infrequent	All licensed handicraft	X				X		
Building Report	Annual	All units	X				X		
Survey on Cost Structure of Non-Agricultural Enterprises	Infrequent	All units		X			X		
20 Germany, West Berlin									
Non-agricultural Establishment Census*									
Handicraft Census*									
21 Ghana									
Industrial Statistics	Annual	a) Units with 10 or more engaged and 6 or more paid employees	X				X	X	X
		b) Smaller units		X			X	X	X
22. Greece									
Industrial and Commercial Establishment Census	Decennial	All units	X				X	X	
23 Hungary									
Statistical Returns, Construction *	Annual								
24 Iceland									
Industrial Census	Triennial	All units paying accident insurance premium	X				X	X	
25 Iran									
Industrial Census*	1963								
26 Iraq									
Industrial Census	1953	a) Units with 20 or more engaged	X				X	X	
		b) Units with 19 or less engaged	X				X	X	
27 Ireland									
Industrial Census	Annual	a) Units with 3 or more engaged	X				X		
		b) Units with 2 or less engaged		X			X		
28. Italy									
General Census of Industry and Commerce	Decennial	All units	X				X	X	X
Value Added Inquiry	Annual	All units		X			X		
29 Jamaica									
Survey of Establishments	1960	All units	X[7]				X		
30 Japan									
Establishment Census	Triennial	All units	X				X	X	
Survey of Construction Works Performed	Annual	All registered units	X				X	X	X

ANNEX Ia (cont'd)

COVERAGE, SOURCE OF INFORMATION AND REPORTING UNIT FOR BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

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			Direct Collection		Administrative Records	Establishment or site unit	Enterprise or other multi-establishment unit	Legal Organization	Economic Organization
			Census	Sample					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
31. Kenya									
Census of Industrial Production	1963	a) Units with 20 or more employees	X				X	X	
		b) Units with 5-19 employees	X				X	X	
32. Libya									
Census of Employment and Production in Urban Areas	1956	All units	X				X		
33 Luxembourg									
Industrial Census (Special form for construction)	Annual	All units	X				X		
34. Madagascar									
Census of Establishments*	1959								
35. Malaysia (Sarawak)									
Industrial Census*	1963								
36 Malta									
Census of Production	Annual	Units with 3 or more engaged	X					X	X
37 Mexico									
Industrial Census	1961	All units	X				X	X	X
38. Mozambique									
Industrial Statistics*	Annual								
39 Netherlands									
Census of Industries	Decennial	All units	X				X	X	X
Survey of Industries	Annual	Units with more than 5 employees acting as contractors. Specialists now being included.		X	Social Insurance Bank		X		X
Survey of Investment in Fixed Assets	Annual	All units	X				X		
40. New Zealand									
Census of Construction	1963	a) All units except governmental work done with own employees	X				X	X	
		b) Govt Depts or local authorities	X						
41. Norway									
Census of Non-agricultural Establishments	Decennial	Units with 1 or more employed	X [4]	X [4]			X	X	X
42 Panama									
National Census of Construction	1963	All units	X				X	X	
43 Philippines									
Economic Census*	Decennial								
44. Poland									
Statistical Returns, Construction*	Annual								
45. Portugal									
Industrial Inquiry	1958/60	All units	X		X		X	X	X
46 Rhodesia and Nyasaland Fed of									
Census of Industrial Production (Separate form for construction)	Annual	All units [5]	X				X	X	X
47 Romania									
Statistical Returns, Industry*	Annual								
48 South Africa									
Industrial Census	Annual	Units with 3 or more engaged or any motive power used	X				X	X	
49 Sweden									
Census of Establishments	Decennial	All units	X				X	X	X
50. Switzerland									
Census of All Industries	Decennial	All units	X				X	X	X
51. Syria									
Census of Industrial, Commercial and Public Service Undertakings*									

ANNEX Ia (cont'd)

COVERAGE, SOURCE OF INFORMATION AND REPORTING UNIT FOR BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Frequency	Coverage (Size of Reporting Unit)	Source of Information			Reporting Unit		Data Sought on	
			Direct Collection		Administrative Records	Establishment or site unit	Enterprise or other multi-establishment unit	Legal Organization	Economic Organization
			Census	Sample					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
52. Tanganyika Survey of Industrial Production*									
53 Thailand Demographic and Economic Survey	1953	All units		X			X	X	X
54 Trinidad and Tobago Census of Industrial Establishments	1958	Units with 5 or more employees	X				X	X	
55 Tunisia Census of Industrial Establishments*	1960								
56 Turkey Census of Manufacturing and Business (Special form for construction)	Decennial	All units with permanent office	X	X[6]			X	X	X
57 U.S.S.R. Report on Basic Activities and Resources of Contract Construction	Annual and more frequent	All units including ancillary units to other industries	X				X		
58 United Arab Republic Establishment Enumeration	Triennial	All units	X				X	*	*
59 United Kingdom Full Census of Production	quinquennial	a) Units with 11 or more engaged	X				X		
		b) Units with 10 or less engaged	X				X		
Sample Census of Production	Annual for other years	a) Units with 25 or more engaged	X				X		
		b) Units with 25 or less engaged	X	X			X		
Census of Craft Force		All units	X				X		X
60 Uruguay Industrial Census		All units	X				X	X	
61 Venezuela Industrial and Commercial Census (Special form for construction)	Decennial	All units	X				X	X	X
62 Viet-Nam, Rep. of Census of Commerce and Industries	1961	Units with licences costing V N $200 or more	X				X	X	X
63 Yugoslavia Construction Report	annual	all construction units subject to licensing	X				X		
Inquiry on Electric Power Stations	Annual	All units with power production above 50,000 KWH or power installed above 20 KW					X		

Notes

"Establishment" in column (6) means that units with more than 1 office make more than 1 return.
In many cases information concerning "Source of Information" in columns (3), (4) and (5) was not available
*Precise information not available.

1. Used only to determine input cost ratios
2. Census for total number engaged by age and sex and sample for the other data sought.
3. Data collected, but not processed.
4. Detailed cost data and total value of sales collected in sample survey
5. Enterprises with fewer than 5 operatives do not complete all items of questionnaire.
6. Small localities covered by sample survey
7. Establishments employing less than 15 persons covered by sample survey

ANNEX Ib

DATA SOUGHT ON EMPLOYMENT, WAGES AND SALARIES AND POWER EQUIPMENT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Employment						Man-hours		Annual Wages and Salaries		Capacity of Power Equipment							Other Machinery Used
	Number engaged by				Employees						Prime Movers			Electric Motors		Elec Generators		
	Status group	Adult or juvenile	Sex	Apprentices	Total for several periods	By functional status	All employees	Operatives	Total	By functional status	Total only	Distinguishing those		Total only	Analysed by source of energy	Total only	Analysed in use and in reserve	
												In use and in reserve	Applied to generator and other					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1 Algeria Industrial Census	X		X	X														
2 Argentina National Mining, Industrial and Commercial Census	X	X	X		X	X			X	X								
3 Austria Non-agricultural Establishment Census	X	X	X		X	X		X	X	X				X				
4 Belgium Census of Industry and Commerce a)	X		X			X			X	X	X			X		X		
b)	X		X								X[1]			X[1]				
5 Brazil Industrial Census	X	X[3]	X[3]		X	X		X	X	X		X			X		X	
6 Bulgaria Statistical Returns, Industry*																		
7 Cameroon Inquiry into Activity of Enterprises*																		
8 Canada Survey of Construction Capital Expenditure Survey	X				X[3]				X	X								
9 Ceylon Census of Industry	X	X[2]	X		X	X			X	X		X	X		X			
10 China, (Taiwan) Census of Industry and Commerce	X	X[2]	X			X			X		X							X
11 Cyprus Census of Industrial Production	X	X	X		X[4]	X			X	X								
12 Czechoslovakia Statistical Returns, Construction		X	X		X	X		X	X	X								
13 Denmark Establishment Census	X	X	X	X		X			X[3]	X		X	X		X			
14 El Salvador Industrial and Commercial Census a)	X		X		X	X		X	X			X	X	X				
b)	X								X					X				
15 Ethiopia Industrial Census			X		X[4]	X			X	X	X			X		X		
16 Finland General Census of Business Establishments a)	X		X		X	X			X	X								
b)	X		X		X	X			X									
Inquiry into Companies	X		X						X	X	X							
17 France Industrial Census a)	X		X	X	X	X		X	X									
b)	X		X	X	X	X		X	X									
c)	X		X						X									
18 Germany, Eastern Industrial Statistics*																		

ANNEX Ib (cont'd)

DATA SOUGHT ON EMPLOYMENT, WAGES AND SALARIES AND POWER EQUIPMENT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Employment						Man-hours		Annual Wages and Salaries		Capacity of Power Equipment							Other Machinery Used
	Number engaged by				Employees						Prime Movers			Electric Motors		Elec Generators		
	Status group	Adult or juvenile	Sex	Apprentices	Total for several periods	By functional status	All employees	Operatives	Total	By functional status	Total only	Distinguishing those		Total only	Analysed by source of energy	Total only	Analysed in use and in reserve	
												In use and in reserve	Applied to generator and other					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
19 Germany, Fed. Rep of																		
Non-agricultural Establishment Census	X		X			X												
Handicraft Census	X	X	X		X	X			X	X	X			X				
Building Report																		X
Survey on Cost Structure of Non-agricultural Enterprises	X[6]					X			X	X	X							
20 Germany, West Berlin																		
Non-agricultural Establishment Census*																		
Handicraft Census*																		
21 Ghana																		
Industrial Statistics a)	X		X	X	X	X			X	X	X		X	X		X		X
b)	X		X	X					X	X	X		X	X		X		X
22 Greece																		
Industrial and Commercial Establishment Census	X		X		X						X				X			
23 Hungary																		
Statistical Returns, Construction																		
24 Iceland																		
Industrial Census			X[2]	X	X	X		X	X	X	X			X				
25. Iran																		
Industrial Census*																		
26 Iraq																		
Industrial Census a)		X	X						X		X			X				X[7]
b)		X	X						X		X			X				X[7]
27 Ireland																		
Industrial Census a)	X	X	X		X	X	X	X	X	X		X[8]	X[8]		X[8]		X[8]	
b)	X	X	X						X									
28 Italy																		
General Census of Industry and Commerce	X	X	X	X	X	X	X		X			X	X	X			X	X
Value Added Inquiry	X						X	X	X									
29 Jamaica																		
Survey of Establishments	X		X		X				X	X								
30. Japan																		
Establishment Census	X					X												
Survey of Construction Works Performed																		
31. Kenya																		
Census of Industrial Production a)	X								X									
b)	X								X									
32 Libya																		
Census of Employment and Production in Urban Areas																		
33 Luxembourg																		
Industrial Census	X		X	X				X	X									

DATA SOUGHT ON EMPLOYMENT, WAGES AND SALARIES AND POWER EQUIPMENT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Statistical Inquiry	Employment						Man-hours		Annual Wages and Salaries		Capacity of Power Equipment							Other Machinery Used
	Number engaged by				Employment						Prime Movers			Electric Motors		Elec Generators		
	Status group	Adult or juvenile	Sex	Apprentices	Total for several periods	By functional status	All employees	Operatives	Total	By functional status	Total only	Distinguishing those: In use and in reserve	Distinguishing those: Applied to generator and other	Total	Analysed by source of energy	Total only	Analysed in use and in reserve	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
34 Madagascar Census of Establishments*																		
35 Malaysia(Sarawak) Industrial Census*																		
36 Malta Census of Production			X			X			X	X		X						
37 Mexico Industrial Census	X		X		X		X		X				X	X		X		
38 Mozambique Industrial tatistics*																		
39 Netherlands Census of Industries	X	X	X			X						X			X			X
Survey of Industries		X	X		X[10]	X			X		X				X			
Survey of Investment in Fixed Assets																		
40 New Zealand Census of Construction a					X[4]				X									
b					X[4]				X									
41 Norway Census of Non-agricultural Establishments	X		X	X	X	X			X	X								
42 Panama National Census of Construction	X			X	X	X			X	X								
43 Philippines Economic Census*																		
44 Poland Statistical Returns, Construction*																		
45 Portugal Industrial Inquiry	X	X	X							X								
46 Rhodesia and Nyasaland, Fed. of Census of Industrial Production	X		X						X									
47 Romania Statistical Returns, Industry*																		
48 South Africa Industrial Census	X		X				X		X			X			X			
49 Sweden Census of Establishments	X		X		X	X			X	X								
50 Switzerland Census of All Industries	X		X	X		X	X	X			X			X				
51 Syria Census of Industrial, Commercial and Public Service Undertakings*																		
52 Tanganyika Survey of Industrial Production*																		

ANNEX Ib (cont'd)

DATA SOUGHT ON EMPLOYMENT, WAGES AND SALARIES AND POWER EQUIPMENT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Employment						Man-hours		Annual Wages and Salaries		Capacity of Power Equipment							Other Machinery Used
	Number engaged by				Employees						Prime Movers			Electric Motors		Elec Generators		
	Status group	Adult or juvenile	Sex	Apprentices	Total for several periods	By functional status	All employees	Operatives	Total	By functional status	Total only	Distinguishing those		Total only	Analysed by source of energy	Total only	Analysed in use and in reserve	
												In use and in reserve	Applied to generator and other					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
53 Thailand																		
Demographic and Economic Survey	X								X			X	X		X		X	
54 Trinidad and Tobago																		
Census of Industrial Establishments	X		X		X	X			X	X			X	X				
55. Tunisia																		
Census of Industrial Establishments																		
56 Turkey																		
Census of Manufacturing and Business	X	X^2	X^2		X				X	X								X
57. U.S.S.R.																		
Report on Basic Activities		X	X		X	X	X	X	X	X		X	X		X		X	X
58. United Arab Republic																		
Establishment Enumeration	X																	
59. United Kingdom																		
Full Census of Production a)	X		X		X	X			X	X		X^8	X^8		X^8		X^8	
b)			X		X^9													
Sample Census of Production a) & b)	X				X^4	X			X	X								
Census of Craft Force	X			X		X												
60. Uruguay																		
Industrial Census			X		X	X		X		X								
61 Venezuela																		
Industrial and Commercial Census	X	X	X		X	X	X	λ	X	X		λ	X		X			
62. Viet-Nam, Rep. of																		
Census of Commerce and Industries	X	X	X	X		X			X		X^{11}			X^{11}		X^{11}		
63 Yugoslavia																		
Construction Report																		
Inquiry on Electric Power Stations											X							

Notes

* Precise information not available.

1 Request only total installed capacity.

2 Data sought for employees only

3 For operatives only

4 Data sought on *average number of employees for the year*

5 Data collected, but not processed

6. Unpaid family members excluded

7 Data sought on type and number

8. Data on power equipment collected intermittently

9 Data sought on average number engaged for the year

10 Enterprises with 10 or more employees report employment quarterly

11 Establishments with licence costing more than U N $2000

ANNEX Ic

DATA SOUGHT ON CAPITAL EXPENDITURE, INVENTORIES, SELECTED COSTS AND OUTPUT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Fixed Assets				Stocks		Costs							Gross Output			Value of work done as sub-contractors	Other receipts
	Annual Expenditure						Materials		Fuels					Total analysed by				
	Total only	Analysed by: New and used	Analysed by: Type	Sales	Excluding the value of work in progress	Including the value of work in progress	Total	By commodities	Total	By type of fuel	Electricity	Sub-contract work	Water consumption	Total only	Type of building, etc.	Location		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1. Algeria Industrial Census			X	X				X		X	X		X		X			
2. Argentina National Mining, Industrial and Commercial Census												X			X	X		
3. Austria Non-agricultural Establishment Census			X				X	X[8]	X	X	X	X		X[1]			X[1]	
4 Belgium Census of Industry and Commerce a) b)																		
5. Brazil Industrial Census							X	X	X	X	X	X			X		X	
6. Bulgaria Statistical Returns, Industry*																		
7 Cameroon Inquiry into Activity of Enterprises*																		
8. Canada Survey of Construction							X							X				
Capital Expenditure Survey		X	X												X	X		
9. Ceylon Census of Industry			X[2]	X[2]			X	X	X		X			X				X
10. China (Taiwan) Census of Industry and Commerce	X		X				X	X	X	X	X			X		X		
11 Cyprus Census of Industrial Production			X[3]		X		X[4]		X[4]		X[4]	X					X	
12. Czechoslovakia Statistical Returns, Construction			X	X			X	X	X	X	X	X		X			X	
13. Denmark Establishment Census			X[5]				X[4]		X[4]	X[7]	X[4]						X[1]	X[1]
14. El Salvador Industrial and Commercial Census a) b)		X	X	X				X		X	X	X		X	X		X	
15. Ethiopia Industrial Census																		
16. Finland General Census of Business Establishment a)		X	X		X		X		X[4]		X[4]	X					X	X
b)		X	X		X[6]		X					X					X	X
Inquiry into Companies			X				X		X					X				
17. France Industrial Census a)	X			X			X			X[7]	X[7]	X	X[7]	X				X
b)	X			X			X			X[7]	X[7]			X				X
c)	X									X[7]	X[7]			X				
18 Germany, Eastern Industrial Statistics*																		
19 Germany, Federal Republic of Non-agricultural Census																	X[1]	X[1]
Handicraft Census					X		X										X[1]	X[1]
Building Report																		
Survey on Cost Structure of Non-agricultural Enterprise					X													
20. Germany, West Berlin Non-agricultural Establishment Census* Handicraft Census*																		
21. Ghana Industrial Statistics a)		X	X	X				X[9]		X[9]	X	X			X		X	
b)								X		X	X				X			
22. Greece Industrial and Commercial Establishment Census																		
23. Hungary Statistical Returns, Construction*																		

ANNEX Ic (cont'd)

DATA SOUGHT ON CAPITAL EXPENDITURE, INVENTORIES, SELECTED COSTS AND OUTPUT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Fixed Assets				Stocks		Costs						Water consumption	Gross Output			Value of work done as sub-contractors	Other receipts
	Annual Expenditure						Materials		Fuels		Electricity	Sub-contract work		Total only	Total analysed by			
	Total only	Analysed by: New and used	Analysed by: Type	Sales	Excluding the value of work in progress	Including the value of work in progress	Total	By commodities	Total	By type of fuel					Type of building, etc	Location		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
24. Iceland Industrial Census					X		X		X		X							X
25. Iran Industrial Census*																		
26. Iraq Industrial Census a)		X[5]	X[5]				X	X[7]	X	X[7]	X	X			X			X
b)			X[5]					X	X		X				X			X
27 Ireland Industrial Census a)		X	X	X	X		X	X	X	X	X			X	X		X	
b)							X[4]		X[4]		X[4]				X			
28. Italy General Census of Industry and Commerce																		
Value Added Inquiry			X[2]		X		X[4]		X[4]		X[4]	X		X			X	X
29. Jamaica Survey of Establishments		X	X			X	X	X	X	X	X	X			X			
30. Japan Establishment Census																		
Survey of Construction Works Performed								X[7]						X				
31. Kenya Census of Industrial Production a)		X	X	X	X		X	X		X	X	X			X			
b)					X		X	X		X	X	X			X			
32. Libya Census of Employment and Production in Urban Areas																		
33. Luxembourg Industrial Census			X[2]		X		X[4]		X[4]		X[4]			X	X			
34 Madagascar Census of Establishments*																		
35. Malaysia (Sarawak) Industrial Census*																		
36. Malta Census of Production		X	X	X				X		X	X	X	X	X				
37. Mexico Industrial Census			X				X	X		X					X			
38. Mozambique Industrial Statistics*																		
39. Netherlands Census of Industries																		
Survey of Industries							X	X	X	X	X	X		X				
Survey of Investment in Fixed Assets		X	X	X														
40. New Zealand Census of Construction a)		X	X	X	X		X					X			X			
b)		X	X	X	X		X								X			
41. Norway Census of Non-agricultural Establishments			X[3]	X	X[6]		X		X		X	X			X		X	X
42. Panama National Census of Construction		X	X	X				X		X	X				X	X		
43. Philippines Economic Census*																		
44. Poland Statistical Returns, Construction*																		
45. Portugal Industrial Inquiry		X	X	X			X		X		X	X		X				
46. Rhodesia and Nyasaland, Fed of Census of Industrial Production			X	X	X		X		X		X	X	X	X				
47 Romania Statistical Returns, Industry*																		
48 South Africa Industrial Census			X	X	X		X			X	X				X		X	
49. Sweden Census of Establishments					X[6]												X	X
50. Switzerland Census of All Industries																		

ANNEX Ic (cont'd)

DATA SOUGHT ON CAPITAL EXPENDITURE, INVENTORIES, SELECTED COSTS AND OUTPUT IN BASIC INDUSTRIAL INQUIRIES INTO CONSTRUCTION

Country and Inquiry	Fixed Assets				Stocks		Costs						Water consumption	Gross Output			Value of work done as sub-contractors	Other receipts
	Annual Expenditure			Sales			Materials		Fuels		Electricity	Sub-contract work		Total only	Total analysed by			
	Total only	Analysed by: New and used	Analysed by: Type		Excluding the value of work in progress	Including the value of work in progress	Total	By commodities	Total	By type of fuel					Type of building, etc	Location		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
51. Syria Census of Industrial Commercial and Public Service Undertakings*																		
52 Tanganyika Survey of Industrial Production*																		
53. Thailand Demographic and Economic Survey											X							X[1]
54 Trinidad and Tobago Census of Industrial Establishment		X	X	X	X		X		X	X	X	X		X				
55. Tunisia Census of Industrial Establishment*																		
56 Turkey Census of Manufacturing and Business							X	X							X			
57. U S S R Report on Basic Activities		X	X[3]	X	X		X	X	X	X	X	X		X	X			
58. United Arab Republic Establishment Enumeration																		
59. United Kingdom Full Census of Production a) b)			X[3]	X	X	X	X[3]	X		X	X[4]	X			X		X	X
Sample Census of Production a)&b)			X[3]	X	X	X	X[4]		X[4]		X[4]	X					X[1]	X[1]
Census of Craft Force																		
60 Uruguay Industrial Census	X					X		X	X		X	X			X	X		
61. Venezuela Industrial and Commercial Census		X	X	X	X		X	X[7]	X	X	X	X		X	X			
62. Viet-Nam Republic of Census of Commerce and Industries								X		X	X[1]		X[1]		X		X	X
63. Yugoslavia Construction Report								X[7]							X			
Inquiry on Electric Power Stations									X	X	X			X				

Notes

* Precise information not available

1. Data sought on combined values
2. Data sought on net additions during the year.
3. Excluding expenditures on land
4. Data sought on combined cost
5. Machinery only
6. Total value only
7. Quantities of individual commodities
8. Smaller enterprises provide total only
9. Data sought on five important kinds used.

ANNEX IIa

DATA SOUGHT IN CURRENT INQUIRIES INTO CONSTRUCTION ON DWELLINGS AND OTHER BUILDING WORK

Country	A. DWELLINGS												B. OTHER BUILDING WORK					
	Data Available on Dwellings						Data Gathered and Published on Dwellings						Data Available	Data Gathered and Published				
	(a) No. of Dwellings	(b) No of Storeys	(c) No of Rooms	(d) Type of Structure	(e) Value of Dwellings	(f) Floor Area	(g) Approvals	(h) Starts	(i) Under Construction	(j) Completions	(k) Public Private Co-operative	(l) Value of Work Done	(m) Volume, Area or Number or Value	(n) Approvals	(o) Starts	(p) Under Construction	(q) Completions	(r) Value of Work Done
Algeria	X						A						Floor area (1)	A				
Argentina													Floor area (1)				M	
Australia	X			X	X	X		Q	Q	Q	Q	J	Number and value (2)				A	
Austria	X	X	X				A			S	A		Number (2)				A	
Barbados	X									A								
Belgium	X	X						M		M	M		No. of bldgs residential and non-residential (3)				M	
Bermuda	X									A								
Bolivia																		Q
Brazil													Floor area (1)	M				
Bulgaria	X	X	X			X				(A)	A							
Cameroon													Floor area of residential and non-residential (3)	Q				
Canada	X				X			M	M	M	M	M						
Central African Republic													Ground area (1)	M				
Ceylon													Floor area of residential and non-residential (3)					A
Chile	X						M						Floor area of residential and non-residential (3)	M				
													Floor area (2)					A
China (Taiwan)													Floor area (1)					M
Colombia													Floor area (1)	M				
													Ground area (2)	A				
Congo (Leopoldville)													Number of buildings (1)	A				
Costa Rica													Floor area (1)	M				
													Floor area (2)	A				
Cuba													No of buildings (1)	A				
Cyprus													No of residential (3)					A
Czechoslovakia	X	X	X	X		X	M	M	M	M	A							
Denmark	X	X	X					Q	?	Q	A		Floor area (2)					M
Dominican Republic													Number of buildings (2)	A				
Ecuador													Number of residential and non-residential (3)	A				
El Salvador													Floor area of residential and non-residential (3)	M				

ANNEX IIa (cont'd)

DATA SOUGHT IN CURRENT INQUIRIES INTO CONSTRUCTION ON DWELLINGS AND OTHER BUILDING WORK

Country	A. DWELLINGS												B. OTHER BUILDING WORK					
	Data Available on Dwellings						Data Gathered and Published on Dwellings						Data Available	Data Gathered and Published				
	(a) No. of Dwellings	(b) No of Storeys	(c) No of Rooms	(d) Type of Structure	(e) Value of Dwellings	(f) Floor Area	(g) Approvals	(h) Starts	(i) Under Construction	(j) Completions	(k) Public Private Co-operative	(l) Value of Work Done	(m) Volume, Area or Number or Value	(n) Approvals	(o) Starts	(p) Under Construction	(q) Completions	(r) Value of Work Done
Ethiopia													Floor area (2)	A				
Finland	X	X	X	X		X	Q	Q	Q	Q	A		Volume (2)				Q	
France	X	X	X				Q		S	Q								
Gabon													Floor area (1)	Q				
Germany, Fed Rep of	X	X	X	X	X		Q		A	M	A		Volume of non-residential (3)	M				
													Floor area of residential (3) non-residential (1)				A	
Germany, Eastern	X	X (1957 only)	X (1957 only)							M	X (1954-58)		Floor area of residential (3)				A	
Greece	X	X	X				M	A		A	A		No of buildings (1)	M				
													Volume (2)				A	
Guatemala													Floor area (1)				M	
Guinea													Floor area (2)	A				
Haiti													No of buildings (1)	A				
Honduras	X									A								
Hungary	X		X							A								
Iceland	X									A			Volume (2)				A	
Iraq													No of residential and non-residential (3)	A				
Ireland	X	X	X				Q	Q	Q	Q	A							
Israel	X		X			A		A		A	A	A	Floor area (2)				A	A
Italy	X		X				Q			M			No of buildings residential and non-residential (3)				M	
													Volume (2)				A	
Ivory Coast													Floor area of residential and non-residential (3)	M				
													Floor area (2)	A				
Jamaica													No. of residential and non-residential (3)	A				
Japan	X	X			X	X	A	M		Q		Q	Floor area (2)		M			
Jordan													Floor area of residential and non-residential (3)				A	
Kenya													Floor area of residential and non-residential (3)					
Korea, Republic of	X							M					Floor area of total (1)	M				
													Floor area (2)	A				
Lebanon													Floor area (1)	M				

ANNEX IIa (cont'd)

DATA SOUGHT IN CURRENT INQUIRIES INTO CONSTRUCTION OF DWELLINGS AND OTHER BUILDING WORK

Country	A. DWELLINGS												B OTHER BUILDING WORK					
	Data Available on Dwellings						Data Gathered and Published on Dwellings						Data Available	Data Gathered and Published				
	(a) No of Dwellings	(b) No of storeys	(c) No of Rooms	(d) Type of Structure	(e) Value of Dwellings	(f) Floor Area	(g) Approvals	(h) Starts	(i) Under Construction	(j) Completions	(k) Public Private Co-operative	(l) Value of Work Done	(m) Volume, Area or Number or Value	(n) Approvals	(o) Starts	(p) Under Construction	(q) Completions	(r) Value of Work Done
Libya													Floor area of residential and non-residential (3)				M	
Luxembourg													No of buildings residential and non-residential (3)	M				
													Number of buildings	A				
Madagascar													Floor area of residential and non-residential (3)	M				
Mali	X						A			A			No of buildings (1)	A				
Mauritius													No. of residential (3)				A	
Mexico													No. of buildings residential and non-residential (3)				M	
													Floor area (1)				A	
Morocco	X						M						Floor area (2)	A				
													Floor area (1)	M				
Mozambique													Floor area (2)				A	
Netherlands	X	X	X	X				Q	Q	M	A		Value and area of building (2)				Q	Q
Netherlands Antilles	X									A			No of buildings (1)				A	
New Zealand	X				X			M		M			No of buildings (1)	M	M		M	
Nicaragua													No. of residential and non-residential (3)	A				
Norway	X		X			X	Q	Q	Q	Q	A		Floor area (2)					Q
Panama													No of buildings residential and non-residential (3)	M				
													No. of buildings (2)	A				
Peru													Floor area (2)	A				
Philippines													No of buildings residential and non-residential (3)	M				
Poland	X		X							Q	A		No of buildings (2)					A
Portugal	X									Q	A		Ground area (2)					Q
Puerto Rico	X							M					No of buildings (2)	A				
													No of buildings non-residential (3)	M				
Romania	X		X							A	A		Floor area of residential(3)					A
Senegal													Floor area (1)	M				
													Floor area of residential and non-residential (3)	A				

ANNEX IIa (cont'd)

DATA SOUGHT IN CURRENT INQUIRIES INTO CONSTRUCTION OF DWELLINGS AND OTHER BUILDING WORK

Country	A. DWELLINGS												B OTHER BUILDING WORK					
	Data available on Dwellings						Data Gathered and Published on Dwellings						Data Available	Data Gathered and Published				
	(a) No. of Dwellings	(b) No. of Storeys	(c) No of Rooms	(d) Type of Structure	(e) Value of Dwellings	(f) Floor Area	(g) Approvals	(h) Starts	(i) Under Construction	(j) Completions	(k) Public Private Co-operative	(l) Value of Work Done	(m) Volume, Area or Number or Value	(n) Approvals	(o) Starts	(p) Under Construction	(q) Completions	(r) Value of Work Done
Singapore	X									A								
South Africa	X									M			No of buildings (2)				M	
Spain	X	X	X							Q	A		Ground area of residential and non-residential (3) Total (1)				M	
Sweden	X	X	X					Q	Q	Q	A							
Switzerland	X	X	X	X			Q		M	M	A		No of buildings (2)				A	
Syria	X						M						Floor area of residential and non-residential (3)	M				
Tanganyika													Floor area of residential and non-residential (3)				Q	
Thailand													Ground area (2)	A				
Togo													Floor area of residential (3)	M				
Trinidad and Tobago							X						Floor area of residential and non-residential (2)	Q				
Tunisia	X						M						Floor area of residential and non-residential (3)	M				
Turkey	X	X					Q						Floor area (2)	M				
Uganda													Floor area of residential and non-residential (3)				A	
Union of Soviet Socialist Republics	X						M	M	M	M	A No private		Floor area of residential (3)				A	Q
United Arab Republic													Ground area of total (1)	A				
United Kingdom	X	X	X		X	X	M	M	M	M	M	Q	Area of industrial building (2)	Q	Q	Q	Q	Q
United States	X	X			X		M	M			M	M	Number of non-farm and total (1) Floor Area (2)	M A	M			M
Uruguay													No of buildings (1)	A				
Venezuela													Floor area (1) Ground area (1)	M A				
Viet-Nam, Republic of													Ground area (2)	A				
Yugoslavia	X	X	X				Q	Q	Q	A			Floor area (2)				A	

NOTES ON COUNTRIES

Reference are to the columns in the Table

Algeria	- Data relate only to 58 cities.
Argentina	- Data relate to Federal District of Buenos Aires only.
Australia	- (h) to (k): Number and value of dwellings. (e): Value of project (m): Value analysed by type of building and state.
Austria	- (j): Includes alterations and repairs and reconstruction.
Barbados	- (j): Data relate to construction under state aid.
Belgium	- (j): Includes reconstruction.
Brazil	- Data recorded only in State Capitals (including the Federal District).
Cameroon	- Data relate only to Douala and Yaounde.
Canada	- (j): Complete monthly survey of urban centres (with 5,000 or more population). The rest on sample. Quarterly for rural and farm areas. (r): Data relate to contracts awarded for all types of work.
Central African Republic	- (n): Data for several types of work, only in Bangui.
Chile	- Data relate only to 59 communes.
China (Taiwan)	- Data relate to cities and localities with a municipality.
Colombia	- Data only relate monthly to 18 cities. 61 cities in 1961 only.
Costa Rica	- Data cover private building only.
Czechoslovakia	- (h) (i) (j): New construction only. (k): Private building mainly in rural areas.
Denmark	- (h) (i) (j): Data cover 76% to 83% of dwellings only.
Ecuador	- From 1958 data relate to four cities.
El Salvador	- Data relate to all urban areas excluding construction carried out by the Institute de Viviende Urbana.
Ethiopia	- Data relate to Addis Ababa only.
Finland	- (h) (i) (j): Excluding reconstruction repairs. Cubic metres. (c): Analysed in number of projects. (g) to (j) and (q): Includes only building covered by permits.

France	- (g): Figures based on building permits including reconstruction of war damage.
Gabon	- Data relate to Libreville and Port Gentil only.
Germany, Fed. Rep. of	- Data exclude the Saar prior to 1960. (e): Data include reconstruction.
Germany, East	- (j): New construction only.
Greece	- (k): Data relate to work begun.
Guatemala	- Data relate to Guatemala City only and private construction only.
Guinea	- Data relate to Conakry only.
Haiti	- Data relate to Port au Prince and Petionville.
Honduras	- Data relate to Tegucigalpa and San Pedro Sula only.
Hungary	- (j): Including reconstruction.
Ireland	- (b): May be at approval stage. (h) (i) (j): New construction only. Data include only dwellings, built under state aided scheme by Local Authorities and private persons. 87% - 94% coverage. Data relate to the total number of completed dwellings from 1961.
Italy	- (g) (j): Data relate to towns with over 20,000 inhabitants. 62%-65% coverage.
Ivory Coast	- Data relate to Adidjan only.
Jamaica	- Data relate to Kingston and suburban St. Andrews only.
Japan	- Data relate to buildings with floor areas greater than 10 square metres. (o): Data for orders obtained by 50 largest enterprises by type of work.
Jordan	- Data cover a varying number of towns.
Kenya	- Data relate only to 6 towns - private only.
Korea, Republic of	- Data relate only to 10 cities (including reconstruction).
Republic of Lebanon	- Data cover Beirut only.
Libya	- Data relate to Tripoli only - Private only.
Madagascar	- Data relate to Tananarive only.
Mexico	- Data relate to Federal district only.
Morocco	- Data relate to French zones only prior to 1959.
Netherlands	- (h) (i) (j): Data relate to 99% new construction only. (h) to (k): Value of work analysed by type.
Netherlands Antilles	- Data relate to Aruba and Curacao only.

New Zealand	- Value of work covered by permits is analysed by type of building.
Nicaragua	- Data relate to Managna only.
Norway	- (a) to (g): Data on area of projects started, etc.
Panama	- Data relate only to Panama City and Colon. Private only.
Peru	- Data relate to Lima only.
Philippines	- Data relate to Manila only.
Poland	- (j): Data for Socialist sector only.
Portugal	- (j): Data include 77% dwellings for which an occupation permit has been delivered (Continent and Isles).
Senegal	- Data relate to Dalcard and surburbs only.
South Africa	- (j): Data relate only to 18 principal urban areas. Private only from 1959.
Spain	- Data include 90% construction, with direct or indirect state aid (for districts with over 20,000 people).
Sweden	- (h) (i) (j): Data cover 99% new construction only.
Switzerland	- Data cover an increasing number of towns and by 1961 about 80% of dwellings.
Syria	- Data relate to 9 principal cities only.
Tanganyika	- Data relate to 12 towns only. Private only.
Thailand	- Data relate to Bangkok only.
Togo	- Data relate to Lame only.
Trinidad and Tobago	- Data relate to urban and secondard rural areas only.
Turkey	- (g): Data relate to construction in selected municipalities.
Uganda	- Data relate to private construction in 5 towns only.
Union of Soviet Socialist Republics	- (g) to (j): Data include Ukrainian S.S.R. up to 1962; Byelorussian S.S.R. up to 1959. (e) (f) (g): Data refer to public authorities only. (g): Data on value of new orders for public and and private housing. (m): Data on value of new orders are collected quarterly for work other than housing for public authorities (including civil engineering), private, industrial and other building.

United States	- (k): Data relate to work begun. (h): Data include non-farm.
Uruguay	- Data relate to Montevideo only.
Viet-Nam, Republic of	- Limited series.
Yugoslavia	- (h) (i) (j): Data relate to socialised sector only. 30% new construction only.

NOTES ON COLUMN "m"

Suffix (1) indicates that only a combined figure is available for dwellings and other buildings.

(2) indicates that an analysis is available for certain types of non-residential building.

The analyses available include:-

Commercial
industrial
hospitals and institutions
schools
libraries
entertainment
religious

and differ in different countries.

(3) indicates that residential buildings are counted as one building irrespective of the number of dwellings included in the building.

Non-residential buildings include all buildings other than residential.

ABBREVIATIONS

No. - Number;

Bldgs.- Buildings;

GENERAL NOTES

The frequency with which the data are collected is indicated by:-

A - Annual
S - Twice yearly
Q - Quarterly
M - Monthly

Some countries are included which apparently only collect some of the data annually but this may mean that sufficient information is not available in the Statistical Office.

ANNEX IIb

DATA SOUGHT IN CURRENT INQUIRIES INTO CONSTRUCTION ON EMPLOYMENT, MAN HOURS AND EARNINGS

Country	Data on Number Employed				Data on Man-hours		Data on Earnings		Coverage	Kind of Inquiry and Source
	Total	Index Published	Group Status	Functional Status	All Employees	Operatives	All Employees	Operatives		
Australia	Q			Q(1)					All employment	Part of full survey on household basis
				Q(2)					Operatives employed in buildings covered by permit and building for government departments New building only.	Information for each project from 950 local government authorities, includes some rural communities Builders make a return for each project Includes owner builders but less frequently
Austria	Q	Q							Wage earners and salaried employees.	Refers to 1,678 representative firms selected throughout Austria figures are based on the situation during the first pay week of each month
Belgium	Q	Q							Wage earners	1,040 firms employing 10 or more workmen in 1951.
Canada	M				M		M		Incorporated companies in construction employing 15 or more workers	Survey of employment Mail Sample based on list of companies provided by the Department of National Revenue.
Czechoslovakia	Q	Q	Q						All enterprises of a given size	Statistics of enterprises
Finland		Q							All enterprises	Statistics of enterprises (sample). Based on statistics covering "Building and Construction" collected by the Research Office of the Building Employers' Association
France	M	M			M				All enterprises	Sample of enterprises of all sizes
Germany, Eastern	Q	Q							Wage earners and salaried employees.	Statistics of enterprises
Germany, Fed. Rep of	M(1)	M	M		M		M		All enterprises.	16,000 out of 60,000 enterprises or local units included in sample which covers those employing 20 or more persons
	Q(2)	Q			Q		Q		Enterprises with 10 or more employees.	Enterprises, sample survey by mail Compulsory.
	S(3)				S		S		All licensed handicrafts	All firms Mail Compulsory Census or sample licensed handicrafts
Ghana	Q						Q		All enterprises	
Hungary	Q	Q							Wage earners and salaried employees.	Statistics of enterprises
Italy	Q	Q							Wage earners.	
Japan	M				M		M		All enterprises with 5 or more employees	Stratified sample Separate figures for firms with 30 or more operatives and 5 to 29 operatives - local unit
Netherlands	Q	Q		Q					All units with 10 or more employees	Local unit
New Zealand	S			S	S		S		All contractors with 2 or more employees and employees of local authorities and government departments.	Mail Compulsory. Register compiled from builders on permits.
Norway	M	M							All persons covered by health insurance.	Administrative records of insurance schemes Individuals
					Q		Q		Enterprises with 5 or more employees	Sample, Compulsory Mail
Switzerland	Q	Q			Q		Q		All enterprises	Sample
Union of Soviet Socialist Republics	M	M					M		All units.	Census Compulsory Mail
United Kingdom	M								All enterprises and public authorities.	Sample of enterprises and all public authorities Mail Compulsory
								M		Index only
						S		S	All wage earners employed by enterprises of 5 or more.	
United States	M				M		M		All enterprises over a certain size	Sample of enterprises of certain size, varying in different states.

NOTES ON COUNTRIES

Australia	- (1) Data on age, sex, status, private or public employment.
	(2) Number employed including those employed by sub-contractors analysed by craft - 5 main crafts, other skilled and labourers. Working principals are included. Enterprises analysed by total of persons engaged (7 groups).
Canada	- Data on employment, earnings and hours worked analysed for building, general engineering, roads and highways, railways.
Finland	- Original statistics are expressed in index numbers.
France	- Data on employment and hours worked used to estimate changes in production.
Germany, Eastern	- Direct labour excluding technical and commercial staff.
Germany, Federal Republic of	- (1) Not in July. Data on persons employed analysed by 5 employment groups. Earnings. Hours worked analysed by type of construction.
	(2) Data on employment, manhours, earnings used to compute index numbers of earnings and hours worked.
	(3) Data in 1956 on employment, earnings, and twice yearly on part equipment inventories, employment and earnings and man hours only.
Ghana	- Numbers employed last month of quarter and total amount paid before deductions, separately for African and non-African employees.
Italy	- Employment on building work entirely or partially financed by the State, local authorities and other public bodies, excluding work entirely or partially financed by communes with less than 20,000 inhabitants.
Japan	- Data analysed by size of establishment, days and hours worked, earnings.
New Zealand	- Data on working proprietors twice a year. All data analysed by type of skilled occupation and type of work.
	Analysis of hourly pay for ordinary and overtime.
Norway	- Six-monthly data on self-employed.
Switzerland	- Analysed by skilled, semi-skilled and unskilled. Building only.

United States	-	Distinguishes between general builders, civil entineering and specialist firms.

GENERAL NOTES:

*Total - Field covered indicated in column "Coverage".

ANNEX III

DETAILED ANALYSIS OF THE CONSTRUCTION STATISTICS COLLECTED IN CERTAIN COUNTRIES

Argentina
Australia
Austria
Canada
Czechoslovakia
Finland
France
Germany, Federal Republic of
Ghana
Italy
Japan
Netherlands
New Zealand
Norway
Switzerland
U.S.S.R.
United Kingdom
United States

ANNEX III

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
ARGENTINA				
National Statistics Department				
1. National Mining, Industrial and Commercial Census	Decennial	All units and governmental authorities	Data on date of starting operation. Major and subsidiary activities. Number of directors and total employees, distinguishing adult and juvenile, family, technical and administrative, and all others, including apprentices, for one period, and total employees for each month of year. Annual earnings for each of these groups of employees. Value of projects in progress and each project completed during year, with location analysed into new work, extensions, and repair and maintenance. Separate data for roads and bridges projects, progress and completed. Name and address of sub-contractors and specialist work carried out, painting, plastering, electrical etc.	Census Mail Compulsory
2. Survey of Building Projects	Annual	Projects covered by permits in Federal District of Buenos Aires	Data on dwellings completed and floor area of all buildings for which permits issued.	Local authority
AUSTRALIA				
Commonwealth Bureau of Census and Statistics				
1. Survey of Building Permits	Monthly	All buildings covered by permit and building for government depts. New building only.	Owner's and contractor's name and address; site, type of building, value of project. Analysed by location, ownership and their type of work - dwellings, other new buildings and alterations and additions.	Information for each project from 950 local government authorities. Excludes some rural areas.
2. Survey of Building Operations	Quarterly	As above.	Number of new houses analysed by 4 groups of material of outer walls and by ownership when commenced, and other buildings analysed by purpose into 11 types of building. Buildings commenced, completed and under construction, separate data for flats, number employed including those by sub-contractors, analysed by 5 groups of main craftsmen, other skilled workers and builders labourers. Working principals are included.	Based on information from 1. above. Builders show details for each project. Includes owner builders but less frequently.
3. Business Surveys	Quarterly	All sections of industry (except rural).	Surveys on (i) New Capital Expenditure, (ii) Stocks and (iii) Labour Turnover, (iv) Pensions and Superannuation, and (v) Anticipated Imports.	Sample survey from pay roll tax framework.
4. Employment Estimates	Monthly	Total civilian employees (private and Government).	Wage and salary earners by industrial group.	Monthly data as to persons employed in factories as shown at Factory Census. Monthly returns from Government bodies and monthly pay roll tax returns.
5. Work Force Survey	Quarterly	All population.	Data on age, sex, marital status, demographic characteristics, I.L.O. Work Force Status, grade of occupation (wages and salary) occupation and industry.	Part of a full survey of the population.
6. Public Enterprise Expenditure on Fixed Capital Equipment	Quarterly	"Dwellings" and "Other New Building and Construction".	Data on expenditure by type of work.	Analysis of expenditure by public enterprises.
7. Housing Finance	Annual	Government and certain other institutions.	Total advances made by Government to states for erecting houses for rental and sales and the number of dwellings completed under the Scheme. Total loans for mortgages from other institutions including some banks, housing commissions, insurance companies and building societies	Incomplete but fairly comprehensive inquiry.

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
AUSTRIA				
Central Statistical Office				
1. Non-agricultural Establishment Census	Decennial	All undertakings and public authorities, except that analysis of materials purchased is only required from enterprises with more than 3 m. schillings turnover during the year.	Data on predominant type of activity (civil engineering, road works, etc.) Membership of Trade Associations, Legal Organisation. No. of employees analysed by status and age, whether skilled, semi-skilled, and unskilled or apprentices. Total number of employees for four dates during the year analysed by status. Total wages and salaries and social insurance contributions and man-hours worked by operatives (excluding pay roll taxes). Number of electric motors analysed into 7 groups of rates K.W. power. Number of generators analysed by 4 groups of rates K.V.A. power. Number of motor vehicles, lorries and trailers of all types analysed into 5 groups of carrying capacity: Value of fuel purchases separately for electricity, oil, other fuels, quantity and value of materials purchased analysed into quantity and value of 5 main materials. Total amount paid to sub-contractors. Total turnover with separate data for work under a consortium. Capital expenditure by type of asset, with separate figures for works and office equipment. Taxable depreciation. Plant holdings analysed into (i) Materials processing (ii) Cranes, hoists and transport equipment, (iii) Soil moving equipment, (iv) Free manoeuvring equipment, (v) Ramming and compacting equipment, (vi) Pumps; (vii) Road making equipment, (viii) Compressed air machines; (ix) Saws and miscellaneous equipment, with considerable detail under each head.	Mail Compulsory List obtained from Taxation Office. Institutional inquiry.
2. Survey of Dwellings	Annual and semi-annual	New dwellings alterations and re-construction.	Number of dwellings approved and completed analysed by type of ownership, number of bedrooms.	Project inquiry based on permits
3. Survey of Employment	Monthly	All enterprises	Total number of employees.	Functional inquiry based on Social Insurance Records
CANADA				
Dominion Bureau of Statistics				
1.Survey of Construction				
Part of Census of Manufacturing Industries	Annual	All enterprises in construction and owner builders	Data about employment earnings, materials used and value of work done but used only to provide ratios of different input factors to output.	Mail. Sample of limited size. Institutional inquiry.
2.Survey of Capital Expenditure on Construction				
Part of Survey of all Capital Expenditure	Annual (and Quarterly estimates)	All industries and governmental authorities	Date on capital investment in construction for all agencies and also expenditure on repair and maintenance. Used with data from (1) to obtain information about output and input on construction industries.	Partly mail, partly field canvassing. Sample of units, Estimates made in a variety of methods. Functional inquiry.
3.Survey of Employment	Monthly	Incorporated companies in construction employing 15 or more workers	Quarterly estimates are based on statistics of employment and hours worked. Data on employment earnings and hours worked.	Mail. Sample based on list of companies provided by Dept. of National Revenue.
4.Survey of Dwelling Projects	(Monthly - (Quarterly-	Urban centres) Rural and farm areas)	Data on new houses started, completed and under construction. Used to estimate housing work put in place.	Count of dwellings undertaken with Central Mortgage and Housing Corporation.
5.Survey of Building Permits	Monthly	Building covered by permits.	Data on permits issued for building. Used to provide additions of new units to mailing lists for other inquirers.	Mail. Municipalities report. Project inquiry.
Private Enterprises				
6.Survey of Contracts Awarded	Monthly	All contracts awarded	Data on contracts awarded	Private enterprises collecting data from contractors, etc.

ANNEX III (cont'd)

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
CZECHOSLOVAKIA				
Central Office of Statistics				
1. Dwellings	Monthly	New private dwellings. Dwellings undertaken by state cooperatives.	Data on dwellings authorised. Data on work begun, analysed by type of owners, building materials used and type of structure.	Project inquiry.
2. Survey of Works in Progress and Works Completed	Monthly and Annual	All work in progress	Data on stage on completion reached analysed into 4 stages, and work completed collected monthly for dwellings and annually for non-residential buildings and for repairs extensions,etc. Number of buildings completed and living space provided analysed by number of rooms, type of dwelling, type of equipment.	Return by investor and contractor
3. Survey of Industry	Annual	All contractors	Data on employment analysed by age and over the period by function, man-hours of operators earnings.	Mail. Census of enterprises.
4. Survey of Capital Expenditure	Annual	All contractors	Data on expenditure on plant and machinery, vehicles, new construction, and materials purchased. Salaries paid to Directors. Mainly concerned with financial aspects.	Mail. Census of enterprises.
FINLAND				
Central Statistical Office				
1. General Census of Business Establishments	Decennial	All firms including governmental and community authorities	Main and sub-contractors make return. Separate return for each commune. Firms in operation during the year included. Data on number of years in operation, number employed by status, salaries and wages and other labour costs, value of sales, materials and fuels purchased, capital expenditure.	Institutional inquiry. Census. Mail.
2. Inquiry into Companies	Annual	Joint stock companies	Data on number of workers employed each month analysed by sex and by status; salaries and earnings, value of production, total costs of production with separate figures for materials, fuel, expenditure on fixed capital by type of asset, power equipment used.	Census
3. Survey of Building Permits	Quarterly but data on permits monthly since 1961	All buildings covered by permits	Data on ownership, type of structure, volume and number of storeys, area of dwellings or flats, name and address of builder. If permits issued. - Date of starting work, completing work, and stage at end of month, method of financing, type of building - single or multi-unit, terrace, other residential or non-residential, conveniences installed, rooms from conversions.	Project inquiry. Returns made by local authorities.
FRANCE				
National Building Federation				
1. Employment	Monthly	All enterprises	Data on employment and hours worked. Used to estimate changes in production.	Institutional inquiry. Sample of enterprises of all sizes.
2. Survey of Industries	Annual	All contractors	Data on legal and economic organization, employment analysed by purpose and by type. Quality of materials purchased, earnings and other building expenses. Used to estimate changes in production annually by net output method.	Census. Mail. Enterprises. All contractors have to "register".
3. Survey of Dwellings	Quarterly	Dwellings covered by building permits	Data on number of dwellings started, in progress with stage of construction reached, analysed by number of rooms, type of dwelling and ownership.	

ANNEX III (Cont'd)

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
GERMANY, Fed. Rep. of				
Federal Statistical Office				
1. Survey of Construction Part of Non-agricultural Establishment Census	Decennial	All enterprises	Data of kind of legal organization, employment value of work done. Used for bench mark statistics.	Census. Compulsory. Mail. All firms employing labour. Local unit. Field Enumeration. Institutional inquiry.
2. Survey on Cost Structure of Non-agricultural Enterprises	Infrequent	All enterprises	Data on employment, earnings and inventories.	Sample survey. Field enumerators (Stratified systematic sample). Enterprises-unit of legal identity.
3. Handicraft Census	1956 and twice yearly	All licensed handicrafts	Data in 1956 on employment, earnings, power equipment and inventories. Twice yearly on employment, earnings and man-hours only.	All establishments. Mail. Compulsory. Census or sample. Licensed handicrafts.
4. Building Report	Annually in July	All enterprises	Data on, branch of industry, persons employed analysed by employment group (13 groups). Turnover yearly. For one month earnings and also turnover and hours worked analysed by type of construction (residential, industrial, roads, etc.) Equipment available analysed by size of entreprise, presented separately for handicrafts and industry.	Mail. Compulsory. Stratified sample local units.
5. Report on Building Industry	Monthly except July	All enterprises	Data on persons employed analysed by 5 employment groups. Earnings. Taxable turnover, hours worked analysed by type of construction.	Institutional inquiry. 16000 out of 60000 establishments or local units included in sample which covers those employing 20 or more persons.
6. Survey of Financing of Building Projects	Quarterly	Dwellings financed by Public Funds	Data on number of dwellings analysed by size, type and purpose. For fully subsidized dwellings data on space and costs also.	Information from offices for public finance or regional authorities.
7. Survey of Building Activity	Monthly/Annual	All construction covered by permits but buildings only.	Data monthly on: i. permits granted, living space, types of construction (i.e., new orders) types of building (i.e., residential, offices, etc.) estimated cost. ii. buildings started analysed as above. iii. buildings completed, including cost. iv. buildings not completed (annually) Annually data on buildings lost by demolition (fire, etc.)	Construction project
8. Orders placed in Civil Engineering (Underground Workings only)	Monthly	All projects costing 25,000 DM or over	Data on value of orders placed for civil engineering (underground works) analysed by building owner, type of work and duration of project.	All governmental and local authorities report
9. Survey of Earnings	Quarterly	Enterprises with 10 or more employees	Data on employment, manhours, earnings used to compute indexes of earnings and hours worked.	Enterprises. Sample survey by mail. Compulsory.

Note: Public authorities undertake practically no work on their own account.

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry
GHANA				
Central Bureau of Statistics				
1. Industrial statistics	Annual	All enterprises	Data on date of establishment of business, legal organization, ancillary activities. Value of output analysed separately for public and private owners and for 7 types of new buildings, and 6 types of civil engineering, for 3 types of repair and maintenance and for work on other fixtures. Value of goods sold, specifying items. Total expenditure including expenditure on earnings for African and non-African employees, payments to sub-contractors and value of materials and fuel purchased and of transport. For large enterprises only, total capital assets and new purchases, stocks and other current assets; current liabilities. For all enterprises, schedule of value of each new contract obtained and in progress, with starting and expected completion dates.	Mail. Compulsory. Census.
2. Inquiry into output, employment, and earnings.	Quarterly	All enterprises	Data on value of work done analysed for public and private owners separately for residential building, non-residential building, civil engineering, repairs and maintenance, numbers employed last month of quarter and total amount paid before deductions, separately for African and non-African employees; stocks of cement, purchases, and consumption during the quarter.	As above.
ITALY				
Central Institute of Statistics				
1. Value Added Inquiry	Annual	All enterprises, including those installing plant	Classified by main activity, construction or installation of plant. Data on ancillary activities. Total value of work done, including value of of work sub-contracted, value of materials purchased, stocks, value of work sub-contracted to other enterprises. Total earnings, including salaries, social contributions, holiday payments, separately for (i) directors and other employees, and (ii) operatives. Total investment, including expenditure on maintenance and exceptional repairs, analysed by type of asset and distinguishing (i) factories and (ii) other buildings.	Mail. Compulsory
2. General Census of Industry and Commerce	Decennial 1961	All local units (Establishments)	Data on legal organization and on plant, analysed into 5 main groups. Number and power of generators installed. Electric motors analysed by K.W. Steam engines fixed and mobile, classified by superficial area of boiler. Transport vehicles analysed into 23 groups. Number employed analysed by status and by sex - 12 groups, including groups for skilled and unskilled workers and apprentices. Numbers employed by sex for each month of the year, and hours worked. Total earnings separately for managerial and clerical employees and for manual and other workers, with contributions for pensions, social welfare.	Mail. Compulsory.
3. Survey of Building Permits	Quarterly and Monthly	Enterprises	Data on legal organization, number of employees.	Mail.
		Projects in towns with over 20,000 inhabitants	Data on numbers and floor area of dwellings and non-residential buildings approved and completed, and for dwellings, number of bedrooms. Approval data quarterly, completions monthly.	Compulsory.

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
JAPAN				
Planning Bureau, Ministry of Construction				
1. Survey of Public Works started	Quarterly	All projects for public authorities	Data on date of starting and estimated date of completion, kinds of work, agency carrying out or ordering work, value, quantity of materials required, workers required.	Project inquiry. All authorities report for all projects.
2. Survey of Construction Works Performed	Annual	All registered contractors	Data on kind of business and work, value of work carried out, main plant in use.	Census.
3. Survey of Construction Business	Annual	Construction under Ministry of Construction	Data on workers employed, quantity of materials used for drawings and survey.	Authorities reports for projects.
4. Survey of Construction Work Orders Received	Monthly	50 principal contractors	Data on value of orders, and work in progress analysed by kind of work.	50 main enterprises report on individual large projects.
5. Survey of Building Started	Monthly	Buildings with floor area greater than $10m^2$	Data for residential and non-residential buildings on work started, duration of construction, site address, owner's name, use, number of stories, floor area and value, and for residential, number of dwellings. Type of construction.	Owners-to-be report on buildings for which permits granted.
Bureau of Statistics, Office of the Prime Minister				
6. Labor Force	Monthly	Persons of 15 or more years old	Data on total employees, hours worked, by sex.	Two stage sample based on District and selected buildings.
Statistics and Research Division, Ministry of Labor				
7. Monthly Labor Survey	Monthly	Establishments with 5-29 regular workers. Establishments with 30 or more regular workers.	Data on employment, hours worked and wages and salaries.	Sample

Notes (1) Classification for building.
1. Dwelling
2. Dwelling industry (dwelling more than 20% of floor area)
3. Agriculture and fishery building.
4. Mining building.
5. Commerce building.
6. Public Service building.
7. Service building.
8. Official business and education building.
9. Other classification.

(2) Classification for Structure
1. Wood frames
2. Reinforced concrete
3. Steel frame
4. Others

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
NETHERLANDS				
Central Bureau of Statistics				
1. Census of Industries	Decennial	All contractors	Data on employment, plant and transport. Used as benchmark statistics.	Mail. Compulsory. List from Tax Inspectors Office supplemented by field canvassing.
2. Survey of Industries	Annual	All enterprises employing more than 5 persons	Data on numbers employed analysed by place employed e.g., site, factory, office, etc. Earnings, plant, sales of goods. Materials purchased. Value of work done analysed by three types of activity.	Mail. Compulsory. Stratified sample of all enterprises in kind of activity units. List from Social Insurance Bank.
3. Buildings Licensed	Monthly	All projects costing more than 2000 guilders. Excludes maintenance and work charged to Public Corporations (mostly maintenance) and work carried out by Dept. of Public Works (Civil Engineering)	Data on cost, space in cubic centimetres and number of new buildings and conversions both residential and non-residential sites. Method of financing, method of building, including civil engineering projects.	All projects. Copies of permits sent in by local authorities. Permits supplied to local authorities by the Bureau.
4. Buildings Licensed	Quarterly	All projects costing more than 10,000 guilders covered by (3) above.	Progress reported on each job and value of work done estimated. Men employed on site.	All projects. Report by building Inspectors who visit sites.
5. Survey of Industries	Quarterly	All units with 10 or more employees.	Data on employment, number of jobs vacant, value of sales and value of unfilled orders.	Local unit. Mail. Compulsory. List as from 1 and 2 above.
6. Survey of Investment in Fixed Assets.	Annual	All enterprises with 10 or more employees	Data on new fixed assets delivered and ordered by type of asset.	Mail. Compulsory. List as from 1 and 2 above.
NEW ZEALAND				
Department of Statistics				
1. Building Permits	Monthly	All permits issued for building only. Also records of work of Government Departments.	Data on owner, builder, cost, and for jobs over £10,000 date of commencement and completion analysed by purpose for which building is required: includes owner builders. Number of dwellings completed.	Copies of permits supplied direct by local authorities. Dwellings completed for local authorities.
2. Survey of Employment	Twice yearly.	All contractors with 2 or more employees and employees of local authorities and Government Departments.	Data on numbers employed and working proprietors, number of vacancies, hours worked and earnings, analysed by types of occupation and by type of work. Data supplied for each month.	Mail. Compulsory. Reports compiled from builders and permits.
3. Census of Construction		All contractors and government authorities.	Data on items covered by International Recommendation for Basic Industrial Statistics to be collected in 1963.	Mail. Compulsory. Kind of activity.
4. Information on Companies	Annual	Companies classified to construction.	Number of companies given and data on income social security charges, etc. purchases and salaries and wages paid.	Based on Tax returns.
NORWAY				
Central Bureau of Statistics				
1. Census of Non-agricultural Establishments	Decennial	Enterprises with 1 or more employed.	Provides benchmark statistics. Data on employment, wages and salaries, capacity of transport equipment, value of and expenditure of fixed assets, stocks, costs, sales, gross value of output, floor space, operating profits and paid-in capital in shares.	Census for large and small enterprises. Compulsory. Mail.List from field canvassing in Census of Population, directories, government agencies, etc.

ANNEX III (cont'd)

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
NORWAY (Cont'd)				
2. Building Licensed and Under Construction	Quarterly	All licensed construction	Data on number and floor space of structures for which permits were issued and of buildings under construction	Returns from Government licensing authorities. Each project.
3. Building Started and Completed	Quarterly	All licensed construction	Data on number and floor space started and completed	As for 2 above.
4. Industrial Production Census	Annual	Establishments producing building materials	Data on value of production and of stock changes, which are used to estimate construction output	Census compulsory. Mail. Lists from Accident Insurance Agency, Associations, etc.
5. Survey of Earnings and Man-hours	Quarterly	Establishments with 5 or more employees	Data on wages and man hours.	Sample. Compulsory. Mail. as for 1 and 4 above.
6. Income Statistics	Infrequent	All incorporated businesses	Data from profit and loss accounts	Enterprise Sample from tax returns.
7. Tax Statistics	Annual	All incorporated businesses	Data on income and tax due. The data with data from (3) and (5) are used to estimate construction output	Enterprise. All returns included.
Directorate of Labour				
8. Manpower Statistics	Monthly Semi-annual and annual	All persons covered by Health Insurance	Data on employment monthly and annually on employees, demi-annually on self-employed, monthly on unemployed.	Administrative records of Insurance Scheme. Individuals.
SWITZERLAND				
Federal Bureau of Statistics				
1. Census of All Industries	Decennial	All enterprises.	Data on legal organization, employment analysed by function and skilled and semi-skilled and apprentices, all groups, natural and immigrant, hours worked. Power plant, transport owned. Type of work carried out.	Census. Returns distributed by field enumerators.
2. Building Permits	Monthly	All dwellings in communes with 1,000 or more inhabitants.	Data on houses under construction and completed analysed by number of hours, type of dwelling by ownership.	Returns from local authorities.
3. Employment	Quarterly	All establishments.	Data on employment, of wages and hours worked	
UNION OF SOVIET SOCIALIST REPUBLICS				
Central Statistical Administration				
1. Report on Basic Activities and Resources of Contract Construction	Annual	All contract construction enterprises including those ancillary to other industries.	Data, actual and planned, on employment, man days, wages and salaries, other labour costs, value and volume of work done. Value, volume and productive capacity of facilities completed for industry. Capacity of electric generators installed. Balance sheet with profit and loss account.	Census compulsory, by mail. All enterprises, i.e., single administration with the right to conclude contracts, and an independant production plan, and ancilliary units of other enterprises.
2. Report on Fulfilment of Plan for Contract Construction	Monthly	All	Data, actual and planned, in volume of work put in place.	Census compulsory, mail.
3. Report on Fulfilment of Cost of Production Plan for Contract Construction	Quarterly	All	Data, actual and planned, in volume of work done and cost analysed by components.	Census compulsory, mail.
4. Report on Fulfilment of Plan	Monthly	All	Data, actual and planned, on employment, wages and salaries, and other payments on account of labour.	Census compulsory, mail.

ANNEX III (cont'd)

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
UNITED KINGDOM				
Board of Trade				
1. Comprehensive Inquiry Part of Census of Production for all Industries	Quinquennial	All enterprises in the construction industries, Government Departments and other Public Authorities in the U.K.	Data on legal and economic organization. Furnishes benchmark statistics. Employment, assets by type of asset. Goods purchased listing certain building materials also fuel and electricity. Value of work carried out as main and sub-contractors, goods sold listing certain goods. Net output can be derived. Stocks and work in progress.	Compulsory. Census by mail. Enterprises employing under 25 complete only question on number of employees, value of work done, goods purchased and made, etc. Economic organization is not provided for Northern Ireland.
2. Census of Production	Annual	Same as under 1 above, in the U.K.	Furnishes benchmark statistics. Data on employment and on stocks held and work in progress and expenditure on fixed assets by type of asset.	Mail. Compulsory. All enterprises with more than 25 employees and a sample of small enterprises. Enterprises making quarterly returns are excluded.
3. Survey of Capital Expenditure	Quarterly & half-yearly	Same as under 1 above, in the U.K.	Data on expenditure on fixed assets by type of asset quarterly and forecast for coming half year and following year. Half-yearly from governmental authorities separate figures are available for types of work, e.g. electricity, schools, water, etc.	1. Mail. Voluntary. Sample of all enterprises. 2. Data from local authorities are supplied to the appropriate Government Department.
Ministry of Public Building and Works				
4. Survey of Employment, Value of Construction Work Done, New Orders.	Monthly/ Quarterly	Same as under 1 above, in Great Britain.	Total employment monthly; quarterly, output and employment by the following 8 types of work. New housing and "other new work" separately for private developers divided between industrial and all "other" work. Repair and maintenance work is divided into 3 groups, housing, work on other structures for public authorities and for private developers. Orders figures have been divided into the first five categories covering new work only, but from January 1964 the value of new individual contracts and location is being collected.	Mail. Compulsory. Sample for 12 months covering enterprises of all sizes. Census once a year.
5. Census of Craft Force	Annual	Same as under 1 above, in Great Britain.	Data on employment distinguishing manual from other employees and skilled labour by craft of operatives.	Mail. Compulsory. Census all enterprises.
Ministry of Labour				
6. Survey of Earnings	Twice yearly (and monthly)	Same as under 1 above, in Great Britain.	Data on earnings and hours worked during a specified pay week analysed by sex and full or part-time. Collected twice yearly. Monthly, an index of average earnings is produced.	Mail. Compulsory. Sample of all enterprises with more than 5 operatives.
7. Employment	Annual	All employees covered by Social Insurance.	Total number of employees.	Exchange of Social Insurance Cards.
Ministry of Housing & Local Government and Scottish Development Department				
8. Survey of Dwellings	Monthly	All new residential dwellings Great Britain	Data on local authority approvals, number of dwellings started, under construction and completed analysed by private and public ownership and by type of dwelling, number of bedrooms, single or multi-unit.	Administrative inquiries. Returns made by all local authorities, Government Departments and public utilities.
Board of Inland Revenue				
9. Survey of Profits	Annual	All private and public companies in U.K. where the agreed assessment is over £5,000.	Total profits and profits as a percentage of turnover.	Based on tax returns where final accounts have been settled.

Footnote: The lists used for inquiries 1-6 are mainly obtained from administrative records but field surveys and publications are also used.

ANNEX III (cont'd)

Agency and Inquiry	Frequency	Coverage	Data Gathered	Type of Inquiry and Source of List
UNITED STATES				
Bureau of the Census				
1. Report of Building Permits	Monthly/ Annual	All permit issuing authorities.	Data on number and total cost of constructing new private and public residential and non-residential buildings approved.	3,500 permit issuing authorities, accounting for 90% of units, report monthly. Another 6,500 annually.
2. Survey of Permit Use	Monthly	All permits issued.	Designed to check extent to which permits issued in (1) are used.	Stratified systematic sample based on (1) above. Mail.
3. Survey of Permit Coverage	Monthly	All residential construction projects in permit area.	Designed to show extent to which dwellings built are not covered by (1) above.	Stratified and sample field canvassing.
4. Survey of Housing Starts in Non-permit Areas	Monthly	All residential projects in non-permit areas.	Designed to provide estimate for construction taking place outside "permit" areas.	As for (3).
5. Survey on Value of New Construction Work Done	Monthly	All construction projects.	Data on total value of projects starting and value of work done on each project. Includes data on expenditure by projects' owners on materials and labour as well as payments to contractors. Distinguishes public and private ownership. Residential and 12 types of non-residential type of work.	Sample survey based on projects notified by F.W. Dodge Corporation and from other inquiries.
6. Survey of Residential Alterations and Repairs	Monthly/ Quarterly	Owner occupiers, tenant and non-resident owners.	Data on expenditure on alterations and repairs.	Sample survey. Owner occupiers and tenant covered by sample field survey. Non-resident owners by mail.
Bureau of Public Roads				
7. Statistics of Highway Construction	Annual	State Highway projects.	Data on value of new construction contracts let.	Reports by State Highway authorities. Mail.
Bureau of Labour Statistics				
8. Report on Employment Earnings and Hours	Monthly	All establishments over a certain size	Data on total numbers employed, hours worked and average hourly earnings, distinguishing general builders, civil engineering and specialist firms.	Sample of establishments of certain size, varying in different States.

ANNEX IV

INDEX NUMBERS OF PRODUCTION AND PRICES DERIVED FROM CURRENT CONSTRUCTION STATISTICS

COUNTRY	Index Numbers of Production (a)				Index Numbers of Building Materials Prices (b)				Index Numbers of Price of Construction (c)			
	Total New Construction	New Housing	Other New Work	Repairs	Total New Work	New Housing	Other New Work	Repairs	Total New Work	New Housing	Other New Work	Repairs
Australia										Q		Q
Austria						Q				Q		
Belgium	Q				Q					Q		
Canada					Q	Q	Q	Q	Q	Q	Q	Q
China (Taiwan)	M									Q		
Denmark										Q		
Finland	Q				Q					M		
France	M				Q					Q		
Germany, Fed. Rep. of	M				Q					Q		
Greece					Q							
Ireland										Q		
Italy					Q					Q(i)	Q(ii)	
Japan					M				M			
Netherlands					Q					Q		
New Zealand					Q							
Norway	Q				Q					Q		
Poland					Q							
Portugal					Q					Q		
South Africa					M							
Spain					Q							
Sweden										Q		
Switzerland					Q					Q		
Turkey					Q							
United Kingdom	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
United States						Q	Q			Q	Q	
Yugoslavia					Q							

NOTES ON COUNTRIES

	Index Refs in Table	
Australia	(c)	Index of the selling prices of houses is computed quarterly. This is based on a four quarterly moving average of the weighted price of houses classified in different categories of size, type of construction and materials of walls. The "Repairs" index covers housing only and is based mainly on materials used for repair work. Both index numbers are used for the retail price index.
Austria	(c)	Index of building input prices. It applies to a typical small dwelling built in Vienna under City of Vienna housing schemes, with $50m^2$ clear living space and approximately $300m^2$ enclosed space inclusive of cellar, staircase, attic and other auxiliary space.
Belgium	(a)	Index covers building construction carried out by contractors.
	(c)	Index of building output-prices. The index covers prices of building materials and labour and includes all other charges affecting the building price.
Denmark	(c)	Index of input prices of a small dwelling house. It is based on wholesale prices for about 20 building materials and on average hourly earnings in the building trades in the provinces.
Finland	(a)	Index based on changes in the net capital formation in construction expressed in 1948 prices.
	(c)	Index of input-prices which measures changes in the building costs of brick dwelling-houses in Helsinki.
France	(a)	Index based on the number of hours worked during a standard four week month for all undertakings engaged in an activity coming within the Building Sector, adjusted annually for changes in productivity derived from census.
	(c)	Index of building output prices brought up-to-date by means of an index of building input-prices. It measures variations in the total cost of constructing residential buildings, and registers in particular the effect of changes in the level of productivity of building undertakings and of variations in the price reductions offered by contractors according to the changing state of the building market.
Germany, Fed. Rep. of	(a)	The index is based on changes in the number of hours worked in firms belonging to the major sectors of construction.
	(c)	Index of output prices based on changes in prices quoted by 1,200 contractors for 120 items of work suitably weighted.

Italy	(c)	(i)	Index measures changes in the input-prices of a residential building of specific volume, built in 1939, with 3 storeys, a central staircase and no outbuildings.
		(ii)	Index measures changes in the cost of building a factory of reinforced concrete with a specific floor space, built in 1947.
Japan		(c)	Index covers all investment goods.
Netherlands		(c)	Index of output prices. The absolute figures in guilders per m^3 on which the index numbers are based relate to the average traditional dwellings built within the framework of the Housing Law.
New Zealand		(b)	Index covers all construction materials. Separate index numbers for home produced and imported materials.
Norway		(a)	Index based on changes in turnover, the floor space completed and man hours worked.
		(b)	Weights of the index are the quantities of materials used in the construction of a four-storey building in brick and concrete, comprising 20 dwellings and 1,720m^2 gross floor area.
		(c)	Index of input-prices calculated by Norges Brannkasse (a semi-public fire insurance company). Urban areas: the basis is a four-storey brick building with 24 flats of two rooms plus kitchen and 8 flats of three rooms plus kitchen. Rural areas: 1 1/2 storey dwelling house built in wood with a base area of 58m^2 and a volume of 411m^3.
Poland		(b)	Index based on retail prices in private sector.
Portugal		(c)	Index of input-prices based on changes in building costs of a residential building erected in Lisbon with three storeys of two dwellings each.
South Africa		(b)	Index covers all construction materials and is based on wholesale prices.
Sweden		(c)	Index measures changes in input prices of a residential block of flats built in Stockholm in 1939. The building is 8.8m broad and has three storeys. It contains 18 dwelling units with an average net floor space of 35m^2.
Switzerland		(c)	Index measures changes in output prices of a residential block of 6 apartments built in Zurich in 1932: allowance is made for improved interior arrangements conforming to present day requirements.
United Kingdom		(a)	Index measures changes in the gross value of output in the building and civil engineering industry in Great Britain for each type of work, adjusted for changes in the cost of construction. To this is added an index based on employment figures of building activity in Northern Ireland.

United Kingdom (cont'd)

(b) Index numbers are based on changes in prices delivered at site of about 50 main groups of materials. The total index covers all types of construction. Only the total index and the index for housing materials are published.

(c) Index of output prices. Changes in the input costs of materials and labour, and of overheads and profits are taken into account. This series is based on those for "new dwellings" and "all other new work". These two are combined by weighting them according to the value of gross output of the two types of work obtained in the Census of Production. Changes in labour cost take into account changes in output per man.