

Department of Economic and Social Information
Statistics Division

International
Recommendations
for **CONSTRUCTION**
STATISTICS



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INTRODUCTION

A. History of the recommendations

1. With the commissioning and subsequent 1968 publication of the first version of International Recommendations for Construction Statistics [1] the United Nations Statistical Commission recognized the need for such recommendations and for their being separate from, and supplementary to, those published for industrial statistics in general. The 1993 publication of a revised version of International Recommendations for Industrial Statistics [2], the 1990 publication of revision 3 of International Standard Industrial Classification of All Economic Activities [3] and the publication of System of National Accounts, 1993 [4] underlined the need for similar updating of the recommendations on construction statistics in such a way as to be consistent with the publications mentioned.
2. At its special session of April 1994, the Statistical Commission agreed on the importance of extending the scope of the Task Force on Industrial Statistics to include construction statistics. In its report to the twenty-eighth session of the Statistical Commission, the Task Force noted that if the Commission wished to obtain a revised version of the International Recommendations on Construction Statistics, the correct approach would be to call for a consultant's report and an expert meeting, after which the Task Force could be charged with follow-up and monitoring.
3. Following this recommendation, the Statistical Commission, at its twenty-eighth session, requested the Statistics Division of the United Nations to proceed with the revision of the International Recommendations for Construction Statistics by a consultant and a subsequent expert group meeting in this field of statistics. An Expert Group Meeting on Construction Statistics, held from 11 to 13 September 1995, reviewed and endorsed the draft revised recommendations prepared by a consultant. At its twenty-ninth session, the Statistical Commission recommended that the revised International Recommendations for Construction Statistics be published as part of the collection of the United Nations manuals.
4. The present revised version of the Recommendations, like the original Recommendations, focuses on economic aspects. Although there had been suggestions to expand the Recommendations by covering social aspects, particularly the important elements of housing statistics, the Statistical Commission considered that the document should generally reflect basic economic approaches of international recommendations, including the revised System of National Accounts, in the field of economic statistics.

B. Special needs for construction statistics

5. The construction industry generally represents a significant share of the total economic activity of a country, with corresponding demands for materials and labour inputs. It is sensitive to movements in the general level of business activity, the movements in construction (at least in a predominantly market economy) tending to both amplify and lead the movements in the economy as a whole. In other words, its peaks are generally relatively higher, and its troughs lower, and both peaks and troughs tend to precede their counterparts in the general business cycle. These swings in levels of construction activity correspond to - indeed, are direct reflections of - shifts from consumption to

savings (capital formation) and vice versa in the economy as a whole. For this reason, any available construction statistics and indicators tend to be closely watched by economic administrators and planners. In this context, current indicators derived from more-frequent-than-annual surveys, even of restricted coverage, may be seen as especially valuable.

6. Although countries with fully developed statistical systems may prefer surveys of capital expenditure across the whole industry spectrum as the source of statistics on capital formation (that is to say, investment in the acquisition and/or creation of fixed assets), developing countries may have no alternative to piecing together such statistics from a variety of sources. For investment in machinery and equipment, for example, a primary source in a country that imports a large proportion of such assets will likely be the administrative documents accompanying such imports for customs and other import control processes. For investment in construction, it may be seen as more feasible to collect information directly from the construction industry than to conduct surveys of investment across the industrial spectrum. Under these circumstances, a country may wish to assign a relatively high priority to construction statistics in the development of its statistical system.

7. Of course, statistics on the construction industry also contribute to the System of National Accounts (SNA) in the same way that statistics for other industries do. Thus, once a commitment to a survey of the construction industry is made, the survey will collect data not only on capital formation by the sectors served by the industry but also on the organization, structure and productivity of the industry itself.

C. Special features of the construction industry

8. Separate recommendations for construction statistics are seen as being necessary because of the special nature of construction activity and organization. Some of the special features of this industry are the following:

(a) There may be wide geographical dispersion of construction activities, even for the same enterprise, over a set of construction sites. Furthermore, work at those sites will be of limited duration and of varying intensity over this duration;

(b) The level of activity tends to vary both with the season and with the weather within a season. In many countries, activity ceases or is at least much reduced during the winter or rainy season;

(c) A large part of production consists of individual "made to measure" products. This feature, which appears to be unique to the industry, makes price or cost comparisons very difficult, even for buildings or other structures of the same size and type, because of differing local circumstances of transportation, labour availability, physical aspects of the site, and so forth;

(d) Although the duration of work at a particular construction site is of limited duration, it nevertheless tends to be longer than the accounting period for a statistical inquiry. Thus the measurement of work in progress on an unfinished product is a major component of construction output for that accounting period;

(e) In most countries, construction work is carried out by a wide variety of agents including large private or public construction enterprises, small

private construction firms, government departments, private non-profit institutions, and individuals working on own account. Furthermore, a significant proportion of construction may be carried out by units whose main activities are in other industries but that also undertake construction work;

(f) A significant proportion of construction activity may be performed by production units of the informal sector.¹ Such units have the characteristic features of household enterprises; their assets do not belong to the production units as such and these units cannot conduct transactions or incur liabilities on their own behalf. Typically, these units are not registered, in the sense that they are unknown as entities (indeed cannot be known as entities since they have no independent existence as such) to the administrative systems of a country. It is in virtue of this absence of registration that the present publication will refer in some places to such units as "unregistered units";

(g) Subcontracting is prevalent in construction, in both the formal and the informal sectors. The basic distinction is between main contractors, undertaking the work for the investor, and subcontractors. There is, however, a variety of possible arrangements. A main contractor may use his own labour to do all of the work, or subcontract out the whole or a part of the project, the subcontractors being general builders and contractors or specialized operations doing only plumbing or electrical work, and so on. An enterprise does not necessarily always play the same role in construction projects; it may act as the main contractor in one project and as a subcontractor in another. Thus, in construction surveys, much care is required to avoid both double-counting (of the same activity by both main contractor and subcontractor) and omissions;

(h) Small units tend to go in and out of business, in response to changing economic and seasonal factors, with relatively high frequency. Furthermore, such units may have frequent changes of address and often operate from premises, particularly dwellings, not readily identifiable as business offices of construction units.

9. These features have considerable influence on the recommendations made in this publication, both in the definition of statistical reporting units for the various classes of inquiry and in the choice of data items to be collected and compiled as statistics.

D. Nature and scope of the recommendations

10. These recommendations may be regarded as an agreed statement both on the general nature of a complete system of surveys covering the whole of construction activity and on the data content of such surveys.

11. Generally, the data requirements are related to the economic statistics important to the SNA. Thus it is the value of economic inputs and outputs that is generally required rather than their physical classification and quantities, although there is provision made in one of the questionnaire outlines for some reporting of specific materials and components inputs. No recommendations have been included, however, on the enumeration of physical outputs in terms, say, of numbers of dwellings and non-residential buildings constructed; square feet of dwelling, retail, storage, and factory floor space; kilometres of roads constructed; and so forth.

12. Data contents are also restricted to data pertaining to the reference period for each survey. This publication specifies no data requirements, for

example, on the value of fixed assets accumulated prior to the reference period nor does it specify data requirements for forward-looking indicators such as tender values on uncompleted work, investment intentions, and so forth.

13. Individual countries are free, of course, to add data requirements both for physical outputs and for forward-looking indicators if they so wish.

14. The current publication coincides in general nature and content with its previous version. However, it differs from that version in a number of important respects:

(a) Although the special circumstances of developing countries are recognized in many specific instances throughout the publication, there is no separate chapter or annex devoted to these circumstances. It is considered that statistical agencies in such countries will be able to work out for themselves the necessary modifications of, and adaptations to, the general recommendations;

(b) Whereas the earlier version suggested different approaches to the definition of statistical units and the collection of data as alternatives, one of which had to be adopted for a particular survey, the current publication presents these alternative approaches as complementary parts of a coherent whole. For example, the project or site is not regarded here as a viable option, itself, with respect to conducting a survey of construction activity that is comprehensive with respect both to coverage of all activity and to collection of all required data.² However, it is included as a necessary component in such a survey as a source of information both/either for the creation or updating of a register³ of construction enterprises and/or for the coverage (on an area sampling basis) of construction activities not covered by the register of construction enterprises;

(c) Whereas the earlier version implicitly organized its recommended system of surveys in terms of the frequencies with which different components of overall construction would be addressed, the current version is more concerned with the methodology by which each of the components may be addressed. Very little explicit attention is given here to the question of frequencies, it being recognized that these are functions of the statistical infrastructure of each country and can only be addressed in the context of the whole statistical system;

(d) The current version takes explicit account of own-account construction by households, which is considered important for developing countries, and recommends methodology and content for surveys of this component of construction activity;

(e) The current version includes specific requirements for data on taxes on production and subsidies.

I. THE SCOPE OF CONSTRUCTION STATISTICS

15. Construction may be defined generally as economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams and so forth. It is necessary to distinguish construction activity, as it may be carried out by any enterprise regardless of its industry classification, from what may be referred to as "the construction industry proper" (or simply "the construction industry"). The latter term is intended to restrict scope to those enterprises or units of enterprises classified to construction by the rules and conventions of the industrial classification system, more particularly the International Standard Industrial Classification of All Economic Activities, revision 3 (ISIC, Rev.3) [3].

16. The construction industry consists of a group of establishments engaged in one or more of the following three-digit ISIC, Rev.3, classifications:

- 451 Site preparation
- 452 Building of complete constructions or parts thereof; civil engineering
- 453 Building installation
- 454 Building completion
- 455 Renting of construction or demolition equipment with operator

These classes together make up division 45 of ISIC, Rev.3. Detailed descriptions of these classes are provided in annex I to this publication. Annex I also lists certain exclusions under each of the classes. These exclusions are not obvious and should be carefully noted.

17. However, a significant amount of construction activity in many countries is carried out by establishments that are not classified (or would not be classified), under the rules and conventions of ISIC, Rev.3, to the construction industry proper. Such activity, incidental to the main activity of the establishment, will usually be predominantly own-account construction, either for the establishment itself or for its parent enterprise. (If this was not the case, a more or less autonomous unit could be treated as an establishment.) Furthermore, a significant amount of construction, particularly in developing countries, may be carried out by households engaged in the construction or extension of their own dwellings or other structures for their own use, including unpaid labour and materials contributions to community projects. Thus, in organizational terms, construction activity may be seen as being carried out by units of any one of five types:

1. Establishments⁴ whose main activity is contract construction in one or more of the classes in division 45.
2. Non-construction establishments carrying out contract construction, but for which such contract construction is not the main activity.
3. Construction establishments whose main activity is own-account construction for their parent non-construction enterprise.

4. Non-construction establishments⁵ carrying out some own-account construction incidental to their main activity.
5. Households engaged in the construction of their own dwellings or other structures for their own use, or in structural improvements or extensions to existing dwellings or structures.

18. Construction activity by publicly owned construction units, for example, road construction and maintenance by local government units, may be an important component of capital formation in developing countries but less important in developed countries where capital projects, as distinct from current repair and maintenance, are almost invariably contracted out to the construction industry proper. However, where local government units are engaged in capital projects, such units belong in principle in class 1 above but, depending on reporting capability, may have in some cases to be assigned to class 4.

19. It is clear, even for countries with well-developed and systematically maintained enterprise/business registers, that only organizational classes 1 and 3 will be immediately recognizable as being engaged in construction and hence that it is only these classes that can feasibly be within the scope of annual, and certainly of more-frequent-than-annual, surveys.

20. Extension of the scope to organizational classes 2 and 4, assuming a register-based survey (in other words, a survey that uses a register of enterprises or establishments as a sampling frame), will require a survey whose scope encompasses the whole of industry - a scope that may be feasible only for infrequent (that is to say, less-frequent-than-annual) surveys, say, at 5- or 10-year intervals - and whose questionnaires addressed to other than construction-classified units include appropriate questions on construction activities.

21. Class 5 can feasibly be included only through household surveys,⁶ more particularly consumer expenditure or household economic activity surveys, and on a relatively infrequent basis.

22. Approaches other than establishment register-based surveys are possible or even necessary, particularly for countries that find the maintenance of an up-to-date register prohibitively expensive or otherwise impossible. Indeed, even when a reasonably up-to-date register is available, it may be necessary to supplement register-based surveys with data from administrative systems (for example, building and/or occupancy permits, the national and the local government budget, and other planning documents) or surveys based on these systems. Finally, the establishment register-based approach may be replaced or supplemented by a register of at least major construction projects or sites and a survey based on such a register. However, these alternative approaches will inevitably suffer some limitation in respect of the types of data that it is possible to collect.

23. The feasible scope for surveys, of differing frequencies, will depend on the resources and the statistical infrastructure available to the statistical agency of each particular country. In general, however, most countries will select some mixture of:

(a) Infrequent coverage of the whole of construction activity, usually through an all-industry survey or census. Such a survey will provide benchmark data on the relative contributions from each of the five organizational classes

listed above, thus facilitating the extrapolation of data derived from (b) just below;

(b) Annual surveys of the construction industry proper, in other words, classes 1 and 3 above.

24. These surveys may be further supplemented with some more-frequent-than-annual data derived either from surveys of the largest construction units, or possibly from a relatively small sample of all construction units, or from such administrative sources as building/occupancy permit-issuing authorities or from quarterly or semi-annual financial reports from national and/or local governments. For the first alternative given here, it should be possible to link the more-frequent-than-annual statistics to the annual ones, the latter thus serving as benchmark information for the former. Data from administrative sources cannot usually be linked in the same way but may nevertheless provide useful indicators of changing levels of construction activity in a country.

25. Because of the widely differing circumstances of financial resources, statistical infrastructure, administrative data sources and perceived needs found in different countries, it is not possible to formulate a definitive recommendation as to scope for each class of survey. Table I.1 represents, however, the scope that will already be feasible in many countries and that might represent an ultimate objective for the remainder of countries. Discussion of appropriate statistical units and data items for the three classes of survey will be offered in the same spirit.

Table I.1. Recommended scope for construction surveys of different frequencies

Scope	Class	Frequency		
		Infrequent	Annual	More frequent than annual
Construction industry	1, 3	✓	✓	✓ ^a
Non-construction establishments	2, 4	✓	✓ ^b	
Individuals/households	5	✓	✓ ^c	

^a Limited data only.

^b Extension of the scope to cover these units annually, in an establishment survey, may be feasible only when there is an annual comprehensive industry survey of establishments. In this case, a limited set of data items may be added to questionnaires addressed to non-construction establishments.

^c Extension of scope to cover own-account construction by individuals (households) will be feasible only if there is a suitable household survey operation to which a limited set of appropriate data items may be added.

II. STATISTICAL UNITS IN CONSTRUCTION SURVEYS

26. Construction activity, like other economic activities, is performed by enterprises whose legal and operational structures do not necessarily coincide. These structures range from the simple case, numerically the most common, in which a single legal entity coincides with a single operating unit, through a single legal entity with two or more distinguishable operating units, possibly engaged in different activities or situated at two or more different locations, to complex cases where a group of several legal entities under common ownership or control comprises multiple operating units whose structure may or may not coincide with the legal structure. It is usually the case, certainly for developed economies, that a relatively few large and complex enterprises account for a disproportionately large amount of the output and employment of the economy. For example, in a country with a million incorporated business entities it may be found that some 5,000 enterprises represent 70 per cent of output and/or employment. Thus it is not surprising to find that, in these same economies, statistical agencies may devote some 10-20 per cent of their business survey budget to maintaining a business register devoted mainly to these large enterprises. Possible approaches to building and maintaining such a register will depend largely on the legal and taxation administrative infrastructure. However, it is usual to find some sort of registration process⁷ for the creation of such legal entities as incorporated companies, non-profit institutions, cooperatives, partnerships and so forth, with parallel processes for national and local government departments and enterprises. These processes will normally provide the foundation for a continuing business register, which the statistical agency must then convert to the form necessary for its statistical inquiries.

27. Budget and time constraints will normally restrict attempts at complete structuring into enterprises, statistical units, and reporting units to a relatively small set comprising the largest enterprises. Smaller enterprises will be handled on an ad hoc basis as part of survey operations themselves. In the present chapter, [3] and [4] have been used to set out some of the principles of the structuring process, often referred to as "profiling", with particular reference to the construction industry and activity.

A. Legal entities

28. Economic activities are performed by individuals or by legal entities, the latter being recognized by law or society as having an existence independent of the persons or institutions that own them. The legal entity may be a corporation (including a public corporation), trust, joint-stock company, partnership or joint venture, individual proprietorship, or some other form of association. Characteristically it owns goods or assets, incurs liabilities, enters into contracts and may be involved in litigation, takes decisions and actions for which it is held responsible, and accountable at law, and maintains income and expenditure accounts and a balance sheet.

29. One corporation may own shares of another corporation, sometimes exerting effective control with less than 50 per cent of outstanding shares. Groups of two or more corporations may be under effective common ownership and control by a group of shareholders, under which circumstances it is common practice for the group or family to compile consolidated accounts including income and expenditure accounts and a consolidated balance sheet. This is not necessarily the case, however; the group may prefer to exercise its control "at arm's length" in which event the statistician should be aware that the expenses,

employment and so on of certain group-level functions must be allocated to the legal entities (or other breakdowns) of the group.

B. Enterprise

30. "Enterprise" is formally defined in [4] as the term used to describe an institutional unit⁸ in its capacity of producer. An enterprise may therefore be a legal entity, as defined above, or an unincorporated enterprise belonging to a household or a government unit. An exception has to be made for ancillary corporations. These are subsidiary corporations wholly owned by a parent corporation, and their productive activities are ancillary in nature, that is to say, they are strictly confined to providing services to the parent corporation, or other ancillary corporations owned by the same parent corporation. Ancillary corporations are combined with their parent corporation to form a single institutional unit.

31. The importance of the enterprise to present purposes resides in the fact that:

(a) Certain types of data (for example, data on investment decisions or intentions) may be available only at the enterprise level;

(b) The enterprise level is usually the appropriate starting point for the delineation of the statistical and reporting units (see below) that will cover the enterprise for statistical purposes.

32. Statistical and reporting units are logically different but, in practice, usually coincident. The statistical unit is the unit for which data are gathered and/or compiled; the reporting unit, the unit from which data are collected. The reporting unit may be smaller than the statistical unit, in which case data are aggregated to the statistical-unit level, or larger, in which case data must be distributed over statistical units. (One example of the latter case has already been given: the enterprise may be the reporting unit for certain kinds of investment data to be distributed over the statistical components of the enterprise. An example of the former case, particular to the construction industry, will be given below.)

33. In breaking down an enterprise into its statistical components, the objective is to get as close as is consistent with the ability to report the required data to units operating at a single location (or at least within a single geographical area, as such areas are defined in the statistical system) and carrying out a single three-digit ISIC production function. A number of unit types are defined below.

C. Kind-of-activity unit

34. In order to facilitate the compilation of statistics on industrially homogeneous activities, the kind-of-activity unit is defined ideally as:

A part of an enterprise that engages in one kind of economic activity in one or more locations.

35. In practice, this ideal definition must be qualified by a number of considerations, the first of which is that the operational units for which data may be collected or compiled may not - in fact, will seldom - be purely

homogeneous with regard to their production activity. Hence, in practice it is necessary to aim at relative, rather than absolute, homogeneity. In construction, the kind-of-activity unit should operate predominantly in one of the five 3-digit subdivisions of the construction division. Further subdivision may be possible and preferred in individual-country statistical systems and, of course, activities (other than ancillary activities purely in support of the primary activity) that do not belong properly to construction at all should, if possible, form their own appropriately classified kind-of-activity units.

36. Data availability is also a necessary constraint on the definition of kind-of-activity units. In general, these data are input and output quantity and price elements, including employment, sufficient for the calculation of operating surplus.

37. These considerations lead us to the following operational definition of the kind-of-activity unit:

An enterprise or part of an enterprise that engages independently in one, or predominantly one, kind of economic activity for which data allowing the calculation of operating surplus are available or can be compiled.

38. It should be noted that no geographical constraint has been placed on the definition of the kind-of-activity unit. Such a constraint will be introduced for other kinds of units.

D. The local unit

39. Many statistical series, for example production and employment statistics, are compiled and published by geographical region within a country. For this purpose, when a geographical breakdown by economic activity is required, it will be necessary to collect and/or compile statistics by what is referred to as the "local unit", defined as:

The one location at or from which all economic activities are carried out by an enterprise.

40. Such locations, as defined above for the construction industry, would generally correspond to construction sites and such ancillary units as warehouses, storage depots and administrative offices supporting work at those construction sites. For construction activity not properly part of the construction industry, the locations would be construction sites, ancillary units (see sect. F below) generally being classified to one or more of the main economic activities of the enterprise.

41. However, it may not be either feasible or necessary to restrict the local unit to individual work sites. For example, two or more sites in close proximity may together form a single local unit. The term may even be extended, given the statistical requirement for geographical disaggregation, to the collection of all physical sites within a single geographical area (as defined for the purposes of the output statistics).

42. For at least some data requirements in construction, respondents may not find it feasible to separate activities at construction sites, or to allocate the data from ancillary units, by three-digit ISIC, Rev.3 (or equivalent) classes. In this case, local units classified to the construction division as a whole may be the appropriate statistical reporting unit for such data. This

does not preclude, however (provided that at least some data is available by three-digit class), allocation of the local-unit data to these classes.

E. The establishment

43. The establishment combines both the kind-of-activity dimension and the locality dimension. An establishment is defined as an enterprise, or part of an enterprise, that is situated in a single location and in which only a single (non-ancillary) productive activity is carried out or in which the principal productive activity accounts for most of the value added.

44. The statistical agency may find it convenient or necessary to use different units in different surveys or surveys of different frequency or timeliness (the last term referring, for example, to the timing of inquiries relative to the end of their reference period). It might, for example, use kind-of-activity units for financial and production forecast statistics and local units for production statistics. In such cases, it may nevertheless be necessary to define and list establishments either in the business register in order to verify the coverage of survey returns for higher-level units or as statistical units for which data will be compiled (by imputation from reporting units where necessary) and that will enter the statistical tabulation process.

F. Ancillary activities

45. The output of an ancillary activity is not intended for use outside the enterprise. An ancillary activity is a supporting activity undertaken within an enterprise in order to create the conditions within which the principal or secondary activities can be carried out. Examples are warehouses, storage depots, administrative offices and transport units. In addition to their defining characteristic of providing support for the principal, or secondary, activities, ancillary activities have certain common characteristics related to their output. The additional characteristics include those described below, in the following terms:

(a) Ancillary activities typically produce outputs that are commonly found as inputs into almost any kind of productive activity;

(b) Ancillary activities produce services - and, exceptionally, goods (provided that they do not become a physical part of the output of the principal or secondary activity) - as output;

(c) The value of an individual ancillary activity's output is likely to be small compared with that of the principal or secondary activities of an enterprise.

46. Ancillary activities are classified to the dominant activity of their associated production units and treated as part of the industry represented by those units. Statistical difficulties arise in construction because such activities, at least in large enterprises, typically service a number of establishments and/or kind-of-activity units, giving rise to the need for allocation of their data (either by the respondent or by the statistical agency) when those establishments and units are used as statistical units for the compilation of SNA and other statistical tabulations.

G. Other units

47. Where no fully articulated business register covering construction is available, the statistical agency may have to resort to other types of statistical unit. The two most common are the construction permit (or, rather, the work covered by the construction permit) and(/or) the construction site. The permit may be used exclusively for certain limited applications (for example, a quarterly or monthly series on housing starts) but more usually will be used, together with other sources of information, as part of the process of constructing a register of current construction projects (or sites).⁹

48. Possible sources of information for this process include:

(a) Construction permits issued by municipal authorities to either the investor (in other words, the ultimate owner of the construction) or to the main contractor acting on the investor's behalf;

(b) Project lists and descriptions provided by head offices of known construction enterprises for those projects on which they are acting as main contractor;

(c) News media reports of new construction projects;

(d) Lists compiled by the statistical agency's regional offices of construction sites in their area of jurisdiction.

49. It will usually be necessary to use two or more of these sources and, as a consequence, considerable effort may be needed to eliminate duplication from the various lists. The source information must therefore be sufficient to unambiguously identify a project and the statistical contact for that project and to accomplish the necessary non-duplication.

50. Once contact is made with the enterprise identified for a project it will be necessary to ensure that the resulting report encompasses the whole project or, if this is not the case, to determine what further contacts must be made in order to cover the whole project. It will often be the case that the main contractor can report certain data (for example, overall costs and progress payments) for the whole project but is unable to report all data on inputs, employment and outputs for the whole project. These would necessitate separate reports from each of the subcontractors, a requirement that would probably call for on-site interviewers of considerable skill and that might be beyond the resources of the survey. Thus there may be considerable limitations on the kinds of data that can be collected in surveys using the project as the reporting unit.

51. For own-account construction by households, the location of the household itself is considered the site and the project consists of all such own-account construction by the household during the reference period. Data pertaining to these projects may be collected on a periodic basis by attaching a suitable module to one of the regular household surveys (assuming that such exist).

52. Finally, it should be noted that the scope of a construction series derived from an establishment (or other business register-based unit) may not coincide exactly with that of a series based on a project register. Apart from the inevitable errors, omissions and duplications involved in constructing and maintaining a comprehensive register, the main source of differences is the difficulty, in a project-based approach, of:

(a) Including data representing ancillary units;

(b) Distinguishing between the construction industry and construction activity as a whole.

53. Thus, where an option exists of using either the register-based or the project-based approach or both, the use of both approaches is best in the case of surveys covering the whole of construction activity and having limited data requirements.

54. A compromise between the two approaches would be to use the site or project list only, or at least mainly, as an information source for the creation or update of the business register. Thus the information collected from the site would be the identifying information for the main contractor (subcontractors can be ignored). These enterprises would then be verified as already being in, or would be added to, the business register before proceeding with the register-based survey. The project list could also be useful as a reverse check on the comprehensiveness of reporting by respondents and as an aid to imputation for non-respondents.

III. DESIGNS FOR CONSTRUCTION SURVEYS

55. In the present chapter, a number of alternative approaches will be enumerated and briefly discussed. Which of these approaches is adopted by a country, or which combination thereof, will depend on its resources, its statistical infrastructure and its perceived needs. A fully developed statistical infrastructure might include:

(a) A systematically maintained business register¹⁰ that defines, links and, where appropriate, classifies enterprises, legal entities, kind-of-activity units, establishments and so forth covering a substantial proportion of construction output;

(b) A system of annual, or at least periodic, comprehensive industry surveys, covering all construction activity¹¹ including own-account construction by establishments not classified to construction;

(c) An ongoing household survey activity based on a national area sample and managed, usually, through regional offices and utilizing a more or less permanent staff of trained enumerators.

56. The overall economic, administrative, and communications environment also constrains the possibilities for survey operational design. In developed economies with efficient postal services, it is usual practice to carry out at least the first phase of data collection by mail. Furthermore, with an efficient national telephone network to which virtually all businesses are connected, a great deal of work on, for example, register construction and maintenance and follow-up to mail surveys can be done by telephone. Efficient systems for corporation taxation and/or other forms of administration of business affairs may provide valuable source data for business register purposes and also, where allowed by law, for the provision of tax data to the statistical agency so as to improve the efficiency of survey operations, for example, in terms of survey sampling designs and imputation for non-respondents. The statistical agency may usually count on reasonably efficient and comprehensive accounting practices in large businesses and in national and state government operations and also on relatively high rates and quality of response from these units in mail surveys. Local government may be more problematic, however, and may require interviews conducted through personal visits and implying much higher costs per unit of data.

57. In less developed economies, on the other hand, neither the postal services nor the telephone systems may be considered sufficiently reliable (or the response rate in surveys using these modes of communication may not be sufficiently high) to provide efficient means of data collection and so it will be necessary to rely on personal visits by trained interviewers. Obviously this will imply high per unit costs and will severely constrain sample size or survey coverage or both.

58. In any event, a construction survey whose scope is the whole of construction activity will be obliged to use some combination of:

(a) Register-based coverage, with sampling stratification and within-stratum sampling rates depending on preliminary measures of the size of construction activity of the units in the register. This component will use mailed (or, where considered necessary, interviewer-delivered and -collected) questionnaires as its primary mode of data collection supplemented, where the

communications environment allows, by telephone operations both for initial contact and for non-response (or unacceptable response) follow-up;

(b) Area sampling coverage of construction projects not covered by register units and of own-account construction by households. The area sample in use in most countries for the national household survey may be adequate. Interview would be the primary data-collection mode, the instruments being enumeration and subsequent interview for visible construction projects and the addition of an occasional module to the regular household survey questionnaire for own-account construction by households.

59. Generally speaking, there is a correspondence between the survey frame and the mode of data collection, register-based samples using mailed (or interviewer-delivered) questionnaires and project-based samples using area sampling and the interview mode.¹² In this connection, the proposal to use information about large projects to update the register of construction enterprises, rather than information about statistical units in survey operations, should be recalled. In the present discussion, project-based sampling refers to those projects unlikely to come to the attention of the statistical agency and that are, in any event, too small or too numerous to warrant tracking on any continuous basis.¹³

60. Although large construction enterprises may be relatively easy to identify, they create special problems of data collection owing to the complex forms in which various classes of information may be available within the enterprise. Various solutions to these problems have been implemented in different countries. At one extreme, register maintenance, including complete structuring of the enterprise in complete sets of statistical and reporting units, is regarded as a more or less separate infrastructure activity, survey questionnaires of appropriate content being addressed directly to these reporting units and subsequently compiled into statistical units. At the other extreme, enterprises are classified merely as single-establishment or as multi-establishment entities, the former receiving a single questionnaire covering the whole set of data required, the latter receiving an enterprise questionnaire covering enterprise-level data and a set of questionnaires for its establishments which the enterprise is then asked to define and report on as part of the survey operation itself. There are, of course, intermediate positions. For example, the complete structuring of the register on an ongoing basis may be attempted for only the very largest enterprises, the more ad hoc approach being used for the smaller. For annual operations, the statistical agency might mail back the list of establishments reported on in the last survey with a request for updatings of, and additions to, the list, with completed questionnaires as appropriate.

61. Table III.1 below sets out a model for a complete system of construction surveys. In this system, the infrequent survey, taking place perhaps every 5 or even every 10 years, provides benchmark statistics for the annual surveys which in turn benchmark the more-frequent-than-annual surveys. Individual countries will of course adapt this model as appropriate to their own circumstances.

62. In some countries it may be possible, or even necessary, to account for one or more components of table III.1 (or at least the building construction sub-component of these components) through a sample of construction permits. If it is feasible to conduct such surveys by mail, sampling can take the form of straightforward list sampling which usually involves some stratification with respect to variables included in the permit data; otherwise area sampling will

be required with interviewer enumeration of permit holders whose addresses fall within the sampled areas.

Table III.1. Coverage, scope and frequency in a system of construction surveys

Frequency	Scope	Coverage
Infrequent	All construction activity	1. Register-based census or sample of enterprises with construction-classified establishments
		2. Limited set of data on own-account construction by enterprises with no construction-classified establishments from a census or sample of such enterprises
		3. An area sample of recognizable construction projects other than own-account construction by households
		4. An own-account construction module added to census or area sample of households
Annual	Construction industry proper	1. Register-based sample of enterprises with construction-classified establishments
	Construction by non-construction-classified establishments	2. Limited set of data on own-account construction by enterprises with no construction-classified establishments from a sample of such enterprises
More frequent than annual	Construction industry proper	1. Register-based sample of enterprises with construction-classified establishments

IV. DATA-COLLECTION GUIDELINES

63. Tables IV.1 through IV.4 below provide the data requirements for each of the coverage classes in the system. These requirements are to be satisfied either by direct collection or by derivation from directly collected data. Definitions of data items are provided in the next chapter.

64. It must be emphasized that these tables are to be taken as guides to the construction of questionnaires and not, in themselves, as model questionnaires. For example, although good questionnaire design often uses considerable redundancy in order both to remind the respondent explicitly of the components to be included in totals (even when there is limited interest in the components themselves) and to provide edit checks on data entry and/or the consistency of reported data, such redundancy has been avoided here. Furthermore, although good questionnaire design should attempt at least limited explanation of data concepts when they first apply in the questionnaire itself, the preference here has generally been to defer such explanations to the following chapter. This is in the interests of making the data structure as clear as possible. Finally, generic names for many data items, such as "social security payments" or "indirect taxes", have been used although it is recommended that individual countries substitute the names by which the components of such items are commonly known to their respondents.

65. Countries setting up a system of industrial surveys for the first time should consider the minimum programme as recommended in the 1983 World Programme of Industrial Statistics - the number of establishments, employment, earnings and gross output classified at the three-digit ISIC level.

66. The following tables of data content and organization are intended as guides to the construction of questionnaires for surveys of each of the four classes of respondent, as follows:

Table IV.1. Establishment-type units used in register-based surveys of the construction industry

Table IV.2. Establishment-type units used in register-based surveys of units carrying out own-account construction but whose main activity is not considered to be construction

Table IV.3. Recognizable construction projects, found in area samples but not included in the business register

Table IV.4. Own-account construction by households enumerated in area samples of households

67. Tables IV.1 and IV.2 are intended for surveys of units that keep formal accounts to which they may refer in responding to detailed questions, while the units to which tables IV.3 and IV.4 refer do not necessarily keep such accounts and would generally require interview surveys. Such surveys, as a practical consideration, could feasibly be used (in most countries) only in conjunction with enumeration of projects or households on an area sample basis.

Table IV.1. Data items, construction establishments

Recommended for collection from/for kind-of-activity units or establishments classified to the construction industry in annual and less frequent (benchmark) surveys. More-frequent-than-annual surveys will usually collect a subset of these items.

1. Statistical unit

- 1.1 Reporting period ■■■■■
- 1.2 Area/location ■■■■■
- 1.3 Main kind of activity ■■■■■
- 1.4 Number of establishments ■■■■■
- 1.5 Legal organization/type of ownership ■■■■■
- 1.6 Nationality of ownership ■■■■■

2. Employment

- 2.1 Total number of persons engaged during a single (preferably peak) period, of which: ■■■■■

	Class	Male	Female	Total
2.1.1	Working proprietors	■■■■■	■■■■■	■■■■■
2.1.2	Unpaid family members	■■■■■	■■■■■	■■■■■
2.1.3	Employees: operatives	■■■■■	■■■■■	■■■■■
2.1.4	Employees: other	■■■■■	■■■■■	■■■■■

- 2.2 Average number of employees over the whole of the reporting period, of which: ■■■■■

	Class	Male	Female	Total
2.2.1	Employees: operatives	■■■■■	■■■■■	■■■■■
2.2.2	Employees: other	■■■■■	■■■■■	■■■■■

- 2.3 Total hours worked by employees over whole of reporting period, of which: ■■■■■

	Class	Male	Female	Total
2.3.1	Employees: operatives	■■■■■	■■■■■	■■■■■
2.3.2	Employees: other	■■■■■	■■■■■	■■■■■

3. Employee compensation and other labour costs

3.1 Wages, salaries and other employee remuneration over the whole of the reporting period, of which:



	Class	Male	Female	Total
3.1.1	Employees: operatives	Braille	Braille	Braille
3.1.2	Employees: other	Braille	Braille	Braille

3.2 Employer's expenditures on social security, pensions and similar schemes on behalf of employees



4. Other expenditures

Total cost/value of goods and services purchased or received during the reporting period, of which:



4.1	Total raw materials and other supplies		Braille
4.1.1	Raw materials for own-account construction	Braille	
4.2	Total finished or partially finished components		Braille
4.2.1	Components for own-account construction	Braille	
4.3	Cost of repairs and maintenance carried out by others on the construction unit's own assets:		Braille
4.4	Cost of hiring plant and/or equipment:		Braille
4.5	Cost of non-industrial services (including rental other than land rental, insurance, marketing, professional services, communication and so forth)		Braille
4.6	Interest and land rental payments		Braille
4.7	Payments to subcontractors		Braille
4.8	Cost of energy supplies		Braille
4.8.1	Fuels	Braille	
4.8.2	Electricity	Braille	
4.9	Other expenditures not elsewhere specified		Braille

4.10 Quantity and cost/value of individually important materials:

Material	Quantity	Value
Braille	Braille	Braille
Braille	Braille	Braille

4.11 Quantity and cost of individually important components:

Component	Quantity	Value
.....
.....

5. Fixed assets

5.1 Total cost of new and used fixed assets acquired from others or produced on own account, and of capital repairs performed, during the reporting period, of which:

	Class	Acquisitions		Own account	Capital repairs	Total
		New	Used			
5.1.1	Machinery and other equipment (excluding transport equipment)	.....	.....		.....	.....
5.1.2	Transport equipment	.....	.....		.....	.....
5.1.3	Buildings and construction	.....	.....	.....	.....	.....
5.1.4	Land (and land improvements)		.....		.....	.....
5.1.5	Land improvements			.....	.....	.....

5.2 Total value of sales of fixed assets during the reporting period, of which:

	Class	Value
5.2.1	Machinery and other equipment (excluding transport equipment)	.....
5.2.2	Transport equipment	.....
5.2.3	Buildings and other structures	.....
5.2.4	Land (and land improvements)	.....

6. Inventory

6.1 Value of stocks of raw materials, prefabricated components, and fuel at beginning of reporting period, of which:

Class	Value
Raw materials
Prefabricated components
Fuel

6.2 Value of stocks of raw materials, prefabricated components, and fuel at end of reporting period, of which:



Class	Value
Raw materials	Braille grid
Prefabricated components	Braille grid
Fuel	Braille grid

6.3 Value of construction, held on own account and intended for sale, at beginning of reporting period, of which:



Class	Value
Residential buildings	Braille grid
Non-residential buildings	Braille grid
Other construction	Braille grid

6.4 Value of construction, held on own account and intended for sale, at end of reporting period, of which:



Class	Value
Residential buildings	Braille grid
Non-residential buildings	Braille grid
Other construction	Braille grid

7. Output

7.1 Value of new construction, other than own-account work, done during reporting period, of which:



	Class	As main contractor		As subcontractor
		By own labour force	By subcontractor	
7.1.1	Residential buildings	Braille grid	Braille grid	Braille grid
7.1.2	Non-residential buildings	Braille grid	Braille grid	Braille grid
7.1.3	Other construction	Braille grid	Braille grid	Braille grid

7.2 Value of repairs and maintenance, other than own-account work, done during reporting period, of which:

.....

	Class	As main contractor		As subcontractor
		By own labour force	By subcontractor	
7.2.1	Capital repairs including restoration and conversions	.....	.....	.....
7.2.2	Current repairs and maintenance	.....	.....	.....

7.3 Receipts from rental of construction or demolition equipment, of which:

.....

	Class	Receipts
7.3.1	Rental with operator	.....
7.3.2	Rental without operator	.....

7.4 Receipts for goods sold in the same condition as received

.....

7.5 Receipts for all goods and services not included above

.....

8. Taxes on production and subsidies

8.1 Value-added tax invoiced to customers

.....

8.2 Value-added tax paid or payable to suppliers

.....

8.3 Other indirect commodity taxes

.....

8.4 Indirect non-commodity taxes

.....

8.5 Subsidies received

.....

Table IV.2. Data items, non-construction establishments

Recommended for own labour-force construction by kind-of-activity units or establishments not classified to the construction industry. It is assumed that these data requirements are satisfied by the addition of appropriate questions to relatively infrequent surveys of the whole of industrial activity. The respondent would be directed to answer these questions only if there were any workers engaged in construction activities during the reference period.

1. Statistical unit^a

2. Employment

2.1 Total number of persons engaged in construction during a single (preferably peak) period

.....

2.2 Average number of persons engaged in construction activity over the whole of the reporting period

.....

2.3 Total hours worked in construction activity by employees over the whole of reporting period

.....

3. Construction output

3.1 Value of new construction done by own labour force during reporting period, of which:

.....

	Class	Value
3.1.1	Residential buildings	.....
3.1.2	Non-residential buildings	.....
3.1.3	Other construction	.....

3.2 Value of repairs, both current and capital, performed by own labour force during the reporting period, of which:

.....

	Class	Value	
		Capital repairs	Current repairs
3.2.1	Residential buildings	.....	.....
3.2.2	Non-residential buildings	.....	.....
3.2.3	Other construction	.....	.....

^a It is assumed that questions, corresponding to those of table IV.1, relating to the statistical units will have been included in the main section of the questionnaire and, hence, need not be shown explicitly as part of this supplement to that questionnaire.

Table IV.3. Data items, project/site as unit

Recommended for projects/sites, other than own-account household construction, not covered by establishment register but included in area samples for complete construction coverage in infrequent (benchmark) surveys.

1. Statistical unit

- 1.1 Date of beginning of construction work ■■■■■
- 1.2 Expected date of completion of construction ■■■■■
- 1.3 Area/location ■■■■■
- 1.4 Own account or contract ■■■■■
- 1.5 Legal organization/type of ownership ■■■■■
- 1.6 Class^a of project, check one:

Class	New	Capital repair
Residential	■■■■■	■■■■■
Non-residential	■■■■■	■■■■■
Other	■■■■■	■■■■■

2. Employment

- 2.1 Total number of persons engaged (or to be engaged) at peak period of activity ■■■■■
- 2.2 Average number of persons engaged (or to be engaged) over whole period of activity ■■■■■
- 2.3 Total hours worked in construction activity by employees over whole of reporting period ■■■■■

3. Construction output

- 3.1 Expected value of construction when completed ■■■■■

^a Countries may wish to expand the classification here (see annex III).

Table IV.4. Data items, household survey supplement

Recommended for own-account construction by households and expected to be attached to household survey questionnaire on an occasional basis. The following schedule should be completed for all separate own-account projects begun or completed during the reference period by any members of this household.

1. Date of beginning of construction work ■■■■■■
2. Expected date of completion of construction ■■■■■■
3. Area/location ■■■■■■
4. Type of project, check one:

Class	New	Capital repair
Residential	■■■■■■	■■■■■■
Non-residential	■■■■■■	■■■■■■
Other	■■■■■■	■■■■■■

5. Expected value of construction when completed ■■■■■■
(Supplement for developing countries)
6. Value of contributions to community projects, ■■■■■■
of which:

6.1 Value of materials contributions:

Construction class	New	Capital repair	Current repair
Buildings	■■■■■■	■■■■■■	■■■■■■
Other	■■■■■■	■■■■■■	■■■■■■

6.2 Hours of unpaid labour:

Construction class	New	Capital repair	Current repair
Buildings	■■■■■■	■■■■■■	■■■■■■
Other	■■■■■■	■■■■■■	■■■■■■

V. DATA DEFINITIONS

A. Cross-classification items

68. Most countries will wish to cross-classify construction statistics in certain ways. Most of the possible classification variables associated with the statistical unit are included in the first section of each of the tables appearing below. These are:

(a) Area/location, classification usually known before the survey;

(b) Main kind of activity, by class (or even finer classification) within the construction division and by division for those units carrying out own-account construction but not themselves classified to construction;

(c) Legal organization or type of ownership;

(d) Nationality of ownership (or controlling interest), at least to level of national as opposed to foreign, but possibly with some further breakdown of foreign.

69. In addition to these known or directly reported classification variables, it will usually be of interest to cross-classify by such measures of size as number of persons engaged, gross output, value added and so on. However, it should be noted that classification by size should normally be applied at the enterprise level (or at least at the level of the aggregation of all construction-classified establishments or kind-of-activity units in the enterprise).

70. Of course, both practical and statistical considerations suggest that not all possible statistics can or should be reported for all cross-classifications. Furthermore, some care should be exercised for statistics (for example, value added) that properly require the taking account of head office and ancillary unit costs. For these items, regional cross-classification of establishment-reported data may not be appropriate.

B. General definitions

1. Reference period/reporting period

71. For annual and less frequent surveys, the reference period (that is to say, the period to which the statistical output nominally refers) will usually be a full calendar year. In many countries, however, corporations (and, in some cases, even unincorporated businesses) are allowed to report for taxation and other accounting purposes for any fiscal year. In this case, the usual statistical practice is to require the corporation or business to report for the fiscal year ending within the calendar year specified as the reference period or, under some circumstances, for the fiscal year having the greatest overlap with the reference period. Thus, the reporting period is the corporation's fiscal year most appropriate to the reference period.

72. For more-frequent-than-annual surveys, the duration of the reference period will coincide with the interval between surveys and the respondent will usually be required to report for that reference period regardless of the respondent's fiscal year.

2. Classes of construction

73. Construction surveys and their resulting statistics generally make a distinction between new construction, on the one hand, and repairs and maintenance, on the other, the latter class being further broken down into capital and non-capital repairs and maintenance. These classes are defined as follows:

(a) New construction refers to site preparation for, and construction of, entirely new structures and/or significant extensions to existing structures whether or not the site was previously occupied. Within this class of construction, further distinctions may be made by the following categories:

- (i) Residential buildings, so classified when more than half of the floor area of the building is intended for dwelling purposes;
- (ii) Non-residential buildings (all buildings not classified as residential);
- (iii) Other construction, comprising all construction projects not predominantly involving the erection of buildings;

(b) Repairs and maintenance covers all construction work not included under new construction. To the extent possible, respondents should provide a breakdown into capital and non-capital repairs, defined as follows:

- (i) Capital repairs including restoration and conversions includes, in principle, all construction work performed for others and intended to extend the normal economic life or to increase the productivity of existing structures;
- (ii) Current repairs and maintenance, includes all construction work performed for others and not classified as capital repairs, restoration or conversion, that is to say, such work as is performed in order to prevent the normal deterioration of existing structures or to maintain them in a normal functional state;
- (iii) According to one possible way of making the distinction in practice, capital repairs will usually require a construction permit (in countries in which such a system is operational) while current repairs and maintenance will not.

3. Valuation

74. All versions of construction surveys require the valuation of goods and services purchased or received and of goods and services delivered. In principle, all such transactions should be valued at market prices, although some departure from this principle may be necessary both for own-account construction and for goods and services received/delivered from/to other units of the same enterprise.

75. More specifically, the valuation of goods, including fixed assets, purchased should be at purchasers' prices, defined in the SNA ([4], para. 6.215) as "the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good

includes any transport charges paid separately by the purchaser to take delivery at the required time and place".

76. More specifically, the purchasers' price is the delivered price to the establishment (or to a storage facility belonging to the establishment, or to a job site of the establishment) including:

- (a) Transport charges invoiced either by the seller or by other agents;
- (b) Insurance charges invoiced to the purchaser;
- (c) Packaging materials invoiced to the purchaser;
- (d) Taxes and duties except for recoverable (value-added) taxes (see below);

and net of discounts and rebates (for example, for packaging returned to seller) to the purchaser.

77. In principle, goods received from other units of the same enterprise should be valued on the same basis but, in practice, it will usually be necessary to accept book values.

78. Services, other than those provided by ancillary units of the same enterprise, should be valued as invoiced, including applicable taxes and duties. It will not usually be feasible to include services, even at book value, performed by ancillary units of the same enterprise. Indeed, it would seem preferable to exclude such services from data collected from establishments, leaving their costs to be allocated from reports received from the ancillary units themselves.

79. Goods and services delivered by construction establishments are predominantly construction put in place during the reporting period. In principle, this work should be valued at basic prices, defined in the SNA ([4], para. 6.205 (a)) as "the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer".

80. Generally, this is the price as invoiced, including all indirect taxes, except value-added tax (VAT) and all taxes on products, duties, fees and so forth, inclusive of subsidies on products and bonuses (for example, for early completion) and net of all penalties (for example, for late completion).

81. It may be noted that purchasers' price may exceed basic price, on the same transaction, by ([4], para. 6.217):

- (a) The value of any non-deductible VAT, other taxes on products, net of subsidies on products, payable by the purchaser;
- (b) The value of any transport charges paid separately by the purchaser and not included in the basic price.

82. The purpose of these distinctions is to avoid double-counting in the SNA either of the VAT component of indirect taxes or other taxes on products, net of subsidies on products, or of transport charges associated with transactions in goods and services.

83. It bears emphasis that the notions of basic and purchaser's prices are economic concepts not necessarily reflected in the terminology or accounting practices of respondents to statistical inquiries. It is necessary to collect data in such a way as to facilitate interpretation and presentation in accordance with these concepts, but statistical agencies are strongly advised to consult with representative potential respondents before finalizing the questionnaires to be addressed to them.

84. Finally, since large construction projects typically have a duration exceeding that of the reporting period, and even small ones may overlap one end point of the reporting period, valuation may have to depend in part on the recording of progress payments received which will depend in turn on the contractual arrangements for the work undertaken. A similar situation exists, of course, for payments by main contractors to subcontractors so that the valuation of goods and services received may also depend on the recording of progress payments made.

C. Definition of items in table IV.1

85. Statistical unit (item 1): The items covered under this heading are generally set forth for purposes of cross-classification of statistical output. It should be noted that, in the case of multi-unit enterprises, some of these items refer more properly to the enterprise of which this unit is a component and, depending on how this problem is handled in the operational design of the survey (see para. 63 above), may be collected at the enterprise level for subsequent allocation to the statistical units entering the data tabulations.

86. The area/location (item 1.2) variable will be classified according to the geographical divisions in statistical use in the country, subject to the restriction that kind-of-activity units covering work at more than one location must be classified at the geographical level that spans all of these locations.

87. Main kind of activity (item 1.3) should be reported at least to the level of detail that will permit classification by three-digit ISIC class. However, finer classification of, for example, special trades within these classes will often be possible and many countries will wish main kind of activity to be reported to the level of detail that permits such classification. The question as formulated in the questionnaire may be either "open" and intended for subsequent coding by the statistical agency or "closed" (in other words, in the form "check the category, in a list of categories, that corresponds most closely to your main activity").

88. Number of establishments (item 1.4) is clearly an "enterprise level" item.

89. Legal organization/type of ownership (item 1.5) is also an "enterprise level" item, usually asked in closed form for a list of categories appropriate to the national economy and legal system. The main distinction is between public (in other words, government) and private ownership, within these primary categories, between levels of government (national, state, local) and between the different legal forms of ownership. A list of categories appropriate for many countries will be equivalent to the following:

Public ownership, national

Public ownership, state

Public ownership, local

Private ownership, incorporated (or limited liability)
Private ownership, unincorporated partnership
Private ownership, individual
Private ownership, cooperative
Private ownership, non-profit institution

Other categories applying in some countries may be joint ventures, government-owned corporations, and unincorporated units owned by limited liability partnerships. Countries should, of course, adapt these categories to their own national circumstances.

90. Nationality of ownership (item 1.6), considered to be of particular importance to developing countries, is intended mainly to distinguish between nationally owned and foreign-owned enterprises. However, in many cases there is a particular relationship with one or more countries and it will be of interest to extend the cross-classification so as to distinguish between these countries and the rest of the world. Furthermore, some countries may wish to expand this question to include a request for percentage of ownership by country or, at least, by some countries and the rest of the world. It may be feasible to collect such information only at the enterprise level.

91. Employment (item 2): There are, of course, many ways of dealing with the question of the time period for which employment should be counted. The suggestion here is that employment be counted for some particular week or pay period, defined either by date or as the period of maximal activity for this unit during its reporting period. In addition, it is suggested that limited data on average employment over the whole of the reporting period be obtained. Data should be collected for a number of categories of worker, as specified below, with a breakdown by sex in each category as resources permit. Some countries, more specifically those without surveys more frequent than annual, may wish to capture seasonal factors by requesting, say, total employment for each quarter or even each month of the reporting period.

92. Total number of persons engaged during a single period (item 2.1) is defined as the total number of persons who work in or for the establishment, whether full-time or part-time, and includes working proprietors, and unpaid family members, as well as paid employees including employees working outside the physical location(s) of the establishment provided they are paid by and under the control of the establishment. Also included are persons on short-term leave (whether paid or unpaid) for some or all of the period as well as persons on strike or stood off. Persons on indefinite leave, military leave or pension should be excluded. The purpose of this question's reference to peak-period employment is to provide, through the contrast with average employment, a measure of capacity utilization.

93. Working proprietors (item 2.1.1) include all individual proprietors and partners actively engaged in the work of the establishment, excluding silent or inactive partners whose principal activity is outside of the establishment.

94. Unpaid family members (item 2.1.2) are defined as all persons living in the household(s) of the proprietor(s) of the owning enterprise and working in or for the establishment without regular pay for at least one third of the normal working hours of the establishment. Individual countries may find it necessary to either restrict or extend this definition to take account of their own culture and economy.

95. Operatives (item 2.1.3) are all employees directly engaged in construction work and related activities of the establishment including work in workshops, stores and other ancillary units considered to be part of the construction establishment or classified to construction in virtue of the disposition of their output (to construction establishments of the same enterprise). Some countries may wish to consider, at least for infrequent inquiries, distinguishing between unskilled operatives and such skilled operatives as carpenters, bricklayers, painters, electricians, plumbers, plasterers, roof tilers, tunnellers, steelworkers, welders, concrete workers and so forth, with the list to be adapted to the circumstances of the country. Exclusions: architects, engineers and other professionally qualified workers, together with bookkeepers, typists and other office workers, watchmen and salespersons.

96. Other employees (item 2.1.4) are all employees, including those listed as exclusions in item 2.1.3, other than operatives.

97. Average number of employees (item 2.2): Since this item is included primarily for purposes of size classification, it may be restricted to employees, taking working proprietors and unpaid family workers from the preceding question. Of course, if employment is requested for quarterly or monthly sub-periods of the reporting period, the average may be calculated by the statistical agency and this question will become unnecessary.

98. Total hours worked by employees (item 2.3): This item is defined as the total number of hours spent at work. More specifically, it should include:

- (a) Hours actually worked during normal periods of work;
- (b) Overtime work, generally paid at higher-than-normal rates;
- (c) Time spent at the place of work on such work-related activities as preparation of the workplace, repairs and maintenance, preparation and cleaning of tools, preparation of receipts, time sheets and reports, and so forth;
- (d) Time spent at the place of work waiting or standing by, and during which no work is done but for which payment is made under the employment contract;
- (e) Paid short rest periods, including tea and coffee breaks.

However, it should exclude:

- (a) Hours paid for but not worked, such as during paid annual leave, paid public holidays, paid sick leave;
- (b) Meal breaks;
- (c) Time spent on travel between home and work, or between a central pick-up point and the job site.

99. In order to ensure that the definition is correctly applied, it may be advisable to request at least some of these sub-items to be reported specifically. Indeed, as a matter of questionnaire design (as distinct from that of the definition to be ultimately applied), it may be better to ask for total paid hours to be reported together with sub-items, or estimates of sub-items, important to the strict application of the definition. One advantage

of this approach is that it becomes possible to use different definitions of employee hours for differently based calculations of labour productivity.

100. Some respondents, particularly smaller respondents with less formal records, may be unable to report hours at all. In the latter case, it will be necessary to impute hours worked from responses to such alternative questions as, say, number of workers, average number of days worked, and length in productive hours of "an average working day".

101. Wages, salaries and other employee remuneration (item 3.1) paid to employees, broken down when possible by employee status (operative, non-operative) and sex, should be reported gross (that is to say, before deductions for tax, employee contributions to pension and/or social security schemes, union dues and other employee obligations) and should include:

(a) Direct wages and salaries paid during the reporting period, whether as straight time, overtime or incentive pay, as well as payments made to pieceworkers;

(b) Wages and salaries paid by the employer for periods of vacation, public holidays and sick leave, and to standbys or persons who have been stood off;

(c) Seasonal and year-end bonuses, gratuities, profit-sharing payments and similar additional payments;

(d) Lay-off or severance payments or compensation for unemployment, provided these are paid by the employer, as opposed to payments from trust or other special funds set up for this purpose;

(e) Payments in kind, defined as those non-capital costs to the employer of goods and services provided to employees (and clearly and primarily of benefit to employees as consumers) free of charge or at significantly reduced cost. Examples are food, beverages, work clothing (except uniforms not suitable for off-duty wear), lodging and so on.

However, this item should exclude:

(a) Employer contributions to social security, pension or similar schemes paid as a statutory or contractual employer obligation;

(b) Expenditures that benefit employers as well as their employees, for example, expenditures on worksite amenities, medical examinations, sports and other recreational facilities, travel and transportation, and entertainment, and similar outlays. These should be included under item 4.5.

102. Payments made as compensation for time and/or expense of travel from home to job site, or for other travel incurred for the benefit of the employer, are somewhat problematic. If such payments are intended to provide compensation significantly in excess of actual out-of-pocket employee expenses, they should be included; otherwise they should be excluded. If excluded from this item, they should be included under item 4.5.

103. Employer's expenditures on social security, pensions and similar schemes on behalf of employees (item 3.2) cover such payments made by the employer on behalf of employees as are normally considered in national accounting practice to form part of labour income but not of earnings. These include both statutory

social security employer contributions and non-statutory contributions to private pension and insurance schemes.

104. Other expenditures (item 4): This item covers all goods and services paid for or payable (in other words, invoiced to the establishment or to the owning enterprise) during the reporting period and consumed or intended to be consumed in the production process (in other words, either used up or incorporated in the product) of the reporting establishment. Capital goods and their installation services components are excluded from this item. The valuation of goods and services received is discussed in subsection B.3 above.

105. Total raw materials and other supplies (item 4.1): This item includes all raw materials (lumber, cement, structural steel and so forth) that enter directly into the construction process as well as all other supplies (including office supplies, small tools and so forth) incidental to the construction process itself. Prefabricated components should be reported under item 4.2.

106. Raw materials for own-account construction (item 4.1.1): This item refers to the component of item 4.1 that will be devoted to the creation of fixed assets owned by the reporting establishment (or the enterprise to which it belongs) and that provides part of the basis for valuation of such fixed assets.

107. Total finished or partially finished components (item 4.2): This item includes all products, such as prefabricated roof trusses, windows, doors, concrete culverts, finished building facings and so forth, that are intermediate in the construction process.

108. Components for own-account construction (item 4.2.1): See item 4.1.1.

109. Cost of repairs and maintenance carried out by others on unit's own assets (item 4.3) includes current repair and maintenance by others on buildings and machinery intended to keep them in good working order. Outlays that lengthen the expected normal life of fixed assets or significantly increase their productivity constitute capital repairs and should be excluded from this item (but reported under item 5.1).

110. Cost of hiring plant and/or equipment (item 4.4) should be reported at the invoiced cost, including the cost of any operators or staff included as an integral part of the service.

111. Cost of non-industrial services (item 4.5) should be reported for all payments and payable amounts, other than land rental and interest on loans, for services from other units not reported elsewhere in item 4. Major sub-items under this are building and equipment rental, insurance, publicity and advertising, professional services, and communication expenses. With regard to services received from other units of the same enterprise, see subsection B.3.

112. Interest and land rental payments (item 4.6) are separated from the costs reported under item 4.5 because of the different treatment given to them in the SNA. The latter are regarded as intermediate consumption of services while the former are transfers to other factors of production.

113. Payments to subcontractors (item 4.7) will reflect all advance, progress and final payments made to subcontractors during the reporting period. In principle, the aggregate of such payments, as reported under this item, should be equal to the aggregate of receipts in the subcontractor column of items 7.1.1 and 7.1.2.

114. Cost of energy supplies (item 4.8) includes the cost of all purchased fuels and electricity received by the establishment, either directly in the production process or for transportation.

115. Quantity and cost of individually important materials (item 4.10): Information on this item is normally collected only in annual or less frequent surveys. Items may be pre-listed in the survey questionnaire, with item selection tailored to the kind of activity if known and if operationally feasible, or left open to the respondent to list and complete. More-frequent-than-annual surveys may seek to collect quantity and price information on individual materials important to the calculation of production and/or price indices.

116. Quantity and cost of individually important components (item 4.11): See remarks for item 4.10.

117. Fixed assets (item 5): The term "fixed assets" refers to physical assets (buildings, machinery, equipment and vehicles, land and land improvements) owned by the enterprise for the benefit or use of this establishment and expected to have a productive life of more than one year. Acquisition of fixed assets includes not only new and used fixed assets but also the "capital repair" of existing assets, in other words, major additions, alterations or improvements intended to extend their normal economic life or to increase their productivity.

118. Total cost of new and used fixed assets (item 5.1) will include both those assets acquired from others and those produced on own account. The layout of the table encompassing items 5.1.1 through 5.1.4 makes it clear that the cost for each asset category includes both new and used assets as well as the cost of capital repairs to existing assets.

119. The term "new fixed asset" is used in this context to indicate that the asset has not been used previously in the country. Thus, newly imported fixed assets are considered new whether or not they were used before being imported.

120. Fixed assets acquired from others, and capital repairs performed by others, should be valued at purchasers' prices, including customs, duties, indirect taxes and fees payable to the Government, installation, direct preliminary costs (for example, site clearance), transport, insurance, packaging charges, and legal and other professional costs (for example, those for architects, engineers, designers). Indirect costs, for example for the financing of the acquisition, are excluded.

121. In principle, acquisitions from other units of the same enterprise should be valued at market prices, in other words, as if they were being acquired on the market from an independent seller. In practice, it may be necessary to accept the amounts posted to the capital accounts of the respective seller and purchaser, provided of course that these units maintain such accounts.

122. Fixed assets and capital repairs produced on own account should be valued at the cost of all work put in place together with allocated overhead costs for the work.

123. The date of expenditure for a fixed asset is treated somewhat differently in construction (buildings and other structures) than in other categories of fixed assets. In both cases, the date of the expenditure is considered the date upon which the purchaser takes legal possession of the asset. However, in the case of construction on order of buildings, roads, dams and other works, the

buyer is considered to have taken possession of any work that has been put in place on the project. The expenditure to be reported is the total value of completed construction projects (in other words, the total invoiced or contracted price(s) for the project) less the amount of progress payments against this work made prior to the reporting period plus progress payments against uncompleted work made during the reporting period. For other categories of assets, the date of expenditure is considered to be the date upon which the contract of sale is concluded, advance payments being regarded as trade advances, and payments (including hire-purchase payments) not made at the time of the contract of sale being regarded as financial claims against the buyer, rather than as capital expenditures. For own-account construction of fixed assets, the work put in place during the reporting period is regarded as the own-account contribution to total fixed capital formation for the period.

124. Machinery and other equipment (excluding transport equipment) (item 5.1.1): This item includes power generating machinery; office machinery, equipment, furniture and furnishings; art objects; construction machinery and equipment; durable containers; professional equipment and instruments; and so forth. Items of small value individually, such as small tools and office desk equipment and furnishings, may be excluded on practical grounds if they are customarily treated as current expenses.

125. Transport equipment (item 5.1.2) is all equipment customarily used for the transport of personnel, equipment and materials, including motor vehicles, aircraft, ships, tramway and railway rolling stock, road haulage tractors and trailers, carts and wagons.

126. Buildings and other construction (item 5.1.3): This item includes residential and other buildings, permanent ways of railways and roads, dams, bridges, tunnels and so forth. This category normally includes an element of land value inseparable in practice from the value of the construction on the land.

127. Land (and land improvements) (item 5.1.4): This category is normally restricted to unbuilt land or to land on which any existing construction is of negligible value. However, land improved by such activities as irrigation and flood control dams and dykes, land clearance and so forth remains part of this category.

128. Land improvements (item 5.1.5): New land improvements (to land already held by the reporting unit) of the types enumerated above are considered "capital repair" to the land asset and should be reported in that column unless performed by own labour force, in which case it should be reported in the "own account" column.

129. Total value of sales of fixed assets (item 5.2): Definitions of valuation, classification and timing of sales of fixed assets are symmetric with respect to those for purchases.

130. Inventory (item 6): This item includes all stocks owned by the parent enterprise and held or controlled by the reporting establishment regardless of where they are physically located.

131. Value of stocks of raw materials, prefabricated components and fuel at beginning of reporting period (item 6.1): In principle, stocks acquired from others should be added to inventory as soon as their cost is payable, stocks produced internally as soon as they are completed and available for use; in

practice, it will usually be necessary to accept the practice of the establishment as to the timing of inventory book entries. Materials, components and fuel owned by others (for example, supplied by customers under the contractual arrangements for construction work) but held by the establishment should be excluded.

132. In principle, valuation for each item in inventory should be at the delivered price (purchasers' prices for stocks acquired from others, producers' prices for those produced internally) as of the last transaction on this item prior to the date of inventory valuation. In practice, it may be necessary to accept book values of inventories.

133. Value of stocks of raw materials, prefabricated components, and fuel at end of reporting period (item 6.2): The same principles for timing and valuation apply as for item 6.1.

134. Value of construction, held on own account and intended for resale, at beginning/end of reporting period (items 6.3 and 6.4): From the SNA point of view ([4], paras. 10.73 and 10.74), construction performed under contract of sale is deemed to be transferred to the buyer in stages as the work is performed. These transfers represent fixed capital formation. Where there is no contract of sale, however, unfinished construction is viewed as work in progress, finished construction as addition to inventory. No gross fixed capital formation is deemed to have occurred until the construction is transferred to a purchaser.

135. Output (item 7), for the purposes of this section, is regarded as output to the market, that is to say, construction and so forth performed on behalf of investors or, if undertaken on own account, sold before the end of the reporting period. Own-account construction intended for own use represents additions to fixed assets and should be reported in item 5.1; own-account construction intended for sale, but not sold before the end of the reporting period, represents additions to inventory and should be reported in item 6.4.

136. Data collected on output should reflect both the classification of the construction product and the contractual status under which the work is performed. Classification is by residential/non-residential buildings and other construction, and also by whether new construction or capital/current repairs and maintenance. Contractual status refers to whether the reporting unit (or its owning enterprise) acted as main contractor or as subcontractor. Where the unit is acting as main contractor, it is also necessary to differentiate according to whether the unit performed the work using its own labour force or engaged the services of a subcontractor.

137. The valuation of all components of the tables of items 7.1 and 7.2 should be done on a consistent basis. In principle, this is the value of work actually performed during the reporting period; in practice, it will usually be necessary to approximate this by resorting to progress payments received or receivable for uncompleted work together with final payments received or receivable for completed work. This practice should be followed symmetrically for all categories in items 7.1 and 7.2. For example, the value of work done by subcontractors on projects for which the establishment is the main contractor will be measured in terms of progress payments to subcontractors, the value of own-labour-force work being the difference between progress payments received or receivable by the establishment and those paid or payable to the subcontractors.

138. All values should be at producers' prices (in other words, as invoiced, including all indirect taxes, fees, duties and so forth), inclusive of bonuses (for example, for early completion) and net of all penalties (for example, for late completion).

139. Receipts from rental of construction or demolition equipment (item 7.3): Strictly speaking, only rental of equipment with operator is classified as a construction activity (class 4550). However, even units whose main activity is the rental of equipment without operator may also, on occasion, provide operators. In order to avoid confusion in reporting and classification, respondents should be asked to provide data separately for the two categories.

140. Receipts for goods sold or transferred in the same condition as received (item 7.4): This item refers to goods (raw materials, components and fuel) owned by the establishment prior to sale or transfer and hence included, in principle, under one of the following items: 4.1, 4.2 or 6.1. Goods sold to units outside the enterprise should be valued at the sale price inclusive of indirect taxes and so forth. For goods transferred to other units of the same enterprise, it will usually be necessary to accept book values.

141. Receipts for all goods and services not included above (item 7.5): This item includes, more particularly, receipts from the provision to others of services of a non-construction or non-industrial nature not already included as integral components (for example, transportation or professional services integral to construction work) of categories already accounted for.

142. Taxes on production,¹⁴ and subsidies (item 8): Taxes on production include both commodity and non-commodity taxes paid by units of production, or the owning enterprise on behalf of such units, and regarded as production expenses. Countries should refer in questionnaires to the specific names or descriptions of taxes particular to the country. In general, however, taxes on production include some or all of:

(a) Commodity taxes: taxes invoiced to customers and payable on goods and services delivered by the producer, including excise, luxury and consumption taxes as well as turnover, export and sales taxes. A special category, to be distinguished as such in data collection, is the net VAT payable by the producing unit after deducting its own VAT paid on intermediate goods purchased from that collected on production delivered;

(b) Non-commodity taxes: taxes that are, from the producers' point of view, part of the cost of production and presumably to be included in the price at which output is sold but that are not specifically invoiced. They include road vehicle and other taxes on transportation equipment and fuel; stamp duties, business registration and licence fees; taxes on land and buildings (except where such taxes constitute merely an interim stage of collection of income or wealth tax); taxes¹⁵ on wages and salaries paid; operating duties; local taxes; official fees and charges for specific public services; taxes on insurance; entertainment duties; levies on the use of fixed assets.

143. It may not be possible to collect data covering all of these items at the establishment level, a factor that should be taken account of in questionnaire design and subsequent allocation of enterprise-level data to the establishment level.

144. Countries should exercise considerable care in ensuring the correct accounting for indirect taxes. In principle, all of the taxes included here,

either as paid or received, should have been included in the purchasers'/ producers' prices for goods and services received/provided. The separate accounting here is necessary in order to facilitate translation of these producers' prices into basic prices and, of course, to provide statistics on the tax burden on the construction industry.

145. Subsidies received (item 8.5): This item covers subsidies, including export and import subsidies, that are related to current production and that are paid on a continuing basis by government authorities in order to influence the selling prices of goods or services and/or to allow adequate remuneration of the factors of production.

D. Definition of items in table IV.2

146. This table covers the data set recommended for infrequent (benchmark) surveys of establishments conducting own-labour-force construction but not classified to the construction industry. "Not classified to the construction industry" implies of course that construction is incidental to their non-construction main activity and, in most cases, that their construction activity is unknown to the register on which the survey is based. It follows that this component of the overall system of surveys outlined in chapter IV will be feasible only when done within the context of a survey covering the broad range of industries. The contents of table IV.2 should be taken as a reminder of the items to be included in a broader questionnaire, with individual countries being left to determine how best they may be included in their own survey systems.

147. Statistical unit (item 1): The data corresponding to item 1 of table IV.1 would normally be included in the broader survey.

148. Employment (item 2): Items under this heading are the corresponding summary items in table IV.1 and are defined in section C. Of course, more detailed information, corresponding to some or all of the detail of table IV.1, may be available from the broader questionnaire but it is unlikely, given the definition of the establishments covered by this supplement, that this detail can be provided separately for the construction activity component of overall establishment activity. Even for the summary data asked for in table IV.2, it is likely that the respondent will have to resort to estimation rather than records.

149. Construction output (item 3): In the broader survey, it is likely that there will be questions on the acquisition or creation of fixed assets, although not necessarily in the detail that would enable the components defined and listed in items 3.1 and 3.2 to be valued separately. Thus, this supplement may involve simply requiring a little more detail in the fixed assets section than would otherwise have been required.

E. Definition of items in table IV.3

150. This table covers the data set recommended for infrequent (benchmark) surveys of construction on projects/sites not covered by the register on which the surveys reflected in tables IV.1 and IV.2 are based and for which the criteria for additions to the register are not met. Given the nature of the situation, this survey component must generally be conducted by interview, implying a per unit cost such as will be feasible only on an area sampling basis

(probably using area samples already selected for ongoing household surveys). Furthermore the type of data that can be collected is necessarily limited to those data available at the site and usually without recourse to accounting records.

151. Item 1 differs from its counterpart in tables IV.1 and IV.2 by requiring the dates of beginning (item 1.1) and of completion or expected completion (item 1.2) of the project. The value of construction put in place during the reference period will be estimated as proportional to the portion of the project duration elapsing during the reference period for the survey.

152. In larger projects, more specifically those involving more than one contractor, considerable skill on the part of the interviewer may be required in determining how many questionnaires are required in order to obtain coverage of the whole project without double-counting of its employment and value components. For example, there will usually be a main contractor, able to provide all data under item 1 and also the value under item 3. However, the main contractor may be unable to account for the employment of subcontractors.

F. Definition of items in table IV.4

153. This table covers the data set recommended for infrequent (benchmark) surveys of own-account construction by households. As was the case for the survey reflected in table IV.3, the data required by table IV.4 must be collected by interview, generally as an occasional supplement to an ongoing household survey based on area sampling. A single household may have been engaged in more than one construction project during the reference period, for example an extension of the household dwelling (residential) and the construction of a farm building (non-residential). A module based on table IV.4 should be completed for each such project.

154. Expected value (item 5): In principle, own-account construction by households should be valued at market prices. However, the principle becomes meaningless in the common situation in which no market exists for the specific output. Under such circumstances, it may be necessary to break item 6 down to cost of input materials at market prices and estimated hours of paid or unpaid labour, using the latter to impute labour costs at the prevailing rate for the locality.

155. As for table IV.3, the value of construction put in place during the reference period will be estimated as proportional to the portion of the project duration elapsing during the reference period for the survey.

156. Communal construction projects, undertaken by informal associations or groups of households for the benefit of the community and using unpaid labour as their main input, will usually be of negligible economic importance in developed countries but of considerable importance in developing countries. They present a special problem for which there appear to be two possible solutions. One is to identify all such projects within the boundaries of the area unit for the next-to-last stage of sampling and attempt a valuation for each such project. The simpler procedure, from the point of view of subsequent data processing, is to include a question in each household survey as to materials and/or unpaid labour or material contributions to communal projects, classified as either non-residential buildings or other construction, during the reference period but without necessarily identifying or explicitly valuing such projects as a whole.

The sample weighting procedures then weight up the household contributions appropriately.

Notes

¹ For an extended discussion of the informal sector, see the extract from the resolution of the fifteenth International Conference of Labour Statisticians, January 1993, concerning statistics of employment in the informal sector, included as the annex to chapter 4 of the SNA, 1993 [4].

² It is recognized, however, that countries with a functioning and comprehensive system of building permits may find this system useful in providing a sampling frame, usually with coverage limited to the construction of residential and non-residential buildings but not extending to engineering construction, for the selection of units capable of supplying a limited set of data.

³ The term "register" will be used throughout the present publication to refer to the list of construction enterprises (or other construction units) compiled for statistical purposes from whatever administrative and other sources are available. It does not imply that a formal registration process exists or that such a process should exist.

⁴ Including "unregistered units" (see para. 8 (f)) and self-employed individuals carrying out construction for others.

⁵ This component includes units of government departments and agencies engaged in public construction activities but classified to government in the SNA.

⁶ Household surveys may also be used to obtain estimates of construction labour inputs over a more general class of construction activity.

⁷ However, in many developing countries this "registration process" may be of very limited coverage and the register used for any particular survey must be built up from a diversity of sources including previous economic censuses, media reports on current or projected construction activities, and so on, and subsequently updated as part of survey operations themselves. Nevertheless, some kind of register, or simply list, of enterprises is a necessary precursor of any economic survey addressed to businesses. Hence it will be convenient throughout this publication to use the generic term "business register", while recognizing that there will nonetheless be considerable variation in how the term is to be interpreted in different countries.

⁸ In the 1993 System of National Accounts, an institutional unit is defined as an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and transactions with other entities.

⁹ However, in some countries the permit is used as the sampling unit in construction surveys, of course encompassing only those classes of construction covered by the building permit system. Such surveys (remembering that permits are usually issued to the investor rather than to the construction enterprise) may be used to obtain only the data that the investor is able to supply and hence will be of limited application in investigating the structure of the

construction industry or in obtaining the statistics required by the SNA for construction activity as a whole.

¹⁰ A register with the level of coverage and maintenance implied here will be found, of course, only in the most developed statistical systems. However, the observation that the construction of a register, even if only on an ad hoc basis, is a necessary precursor of any business survey, permits the references to "register-based" coverage occurring throughout this publication. However, the term should be interpreted in the light of the circumstances of each country.

¹¹ Although not necessarily as construction activity per se. For example, such surveys may collect data on investment in fixed assets, with some breakdown of the type of fixed assets, but without necessarily determining whether the construction component is own-account construction or other, or asking for data on specific inputs and outputs.

¹² A possible crossover from one mode to the other may occur for the follow-up of non-respondents to a register-based mail survey. For non-response to the mail phase by smaller units, it may even be necessary to impose an area sampling second-phase design on the first-phase register sample, since an interview follow-up of all non-respondents (regardless of location) will seldom be feasible.

¹³ Area sampling for projects not covered by the register-based sample requires the enumeration of all visible construction projects, not being own-account household construction and not being carried out by registered enterprises and hence accounted for in the register-based sample, in the sampled areas. Such projects are typically small and of limited duration. The limited-duration aspect gives rise to the problem that projects carried out during the reference period may already have been completed before the area sample survey enumeration and hence are no longer visible to the enumerators as relevant construction projects. An analogous problem occurs, if the survey enumeration takes place within the reference period, for projects not yet begun. There are basically two approaches to dealing with this problem: enumeration by an enumerator resident throughout the reference period; or extrapolation by one means or another from the survey observation period to the whole of the reference period. The first of these solutions will usually be feasible only in countries that use resident enumerators for their household survey system; the second will require the development of a model of construction seasonality.

¹⁴ Taxes on production are referred to in earlier publications (for example, [1] and [2]) as "indirect taxes", the term implying that these taxes can be passed on, in whole or in part, to other institutional units by increasing the prices of goods or services sold. However, the SNA ([4], para. 7.50) recognizes that "it is extremely difficult, if not impossible, to determine the real incidence of different kinds of taxes, and the use of the terms 'direct' and 'indirect' taxes has fallen out of favour in economics and is no longer used in the System".

¹⁵ Taxes on wages and salaries paid are to be distinguished from employers' expenditures on social security, pensions and similar schemes as reported in item 3.2. Taxes to be reported in item 8.4 are regarded in the SNA as unrequited payments by enterprises to government while expenditures reported in item 3.2 are regarded in the SNA as payments to labour.

References

- [1] International Recommendations for Construction Statistics, Statistical Papers, No. 47 (United Nations publication, Sales No. E.68.XVII.11).
- [2] International Recommendations for Industrial Statistics, Statistical Papers, No. 48, Rev.1 (United Nations publication, Sales No. E.83.XVII.8).
- [3] International Standard Industrial Classification of All Economic Activities, Statistical Papers, No. 4, Rev.3 (United Nations publication, Sales No. E.90.XVII.11).
- [4] Commission of the European Communities, International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations and World Bank, System of National Accounts, 1993 (United Nations publication, Sales No. E.94.XVII.4).
- [5] Provisional Central Product Classification, Statistical Papers, No. 77 (United Nations publication, Sales No. E.91.XVII.7).

Annex I

THE CONSTRUCTION INDUSTRY AS DEFINED IN THE THIRD REVISION OF
THE INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL
ECONOMIC ACTIVITIES (ISIC, REV.3)

F CONSTRUCTION
(division 45)

DIVISION 45 CONSTRUCTION

451 4510 Site preparation

This class includes demolition or wrecking of buildings and other structures, clearing of building sites and sale of materials from demolished structures. Blasting, test drilling, landfill, levelling, earth-moving, excavating, land drainage and other land preparation. Also included are tunnelling, overburden removal and other development and preparation of mineral properties and sites, except oil and gas sites.

Exclusions: Preparation of oil and gas fields is classified in class 1110 (Extraction of crude petroleum and natural gas), when performed on own account, and in class 1120 (Service activities incidental to oil and gas extraction excluding surveying), when performed on a fee or contract basis, respectively.

452 4520 Building of complete constructions or parts thereof, civil engineering

This class includes general construction and some special trade construction for buildings and general and special trade construction for civil engineering, regardless of the kind of materials used. It includes new work, additions and alterations, the erection of prefabricated buildings or structures on the site and also construction of temporary nature. Also included is repair of civil engineering projects, but most repairs of buildings that are not complete alterations or additions are classified in classes 4530 (Building installation) and 4540 (Building completion). General construction mostly involved in the construction of entire dwellings, office buildings, stores and other public and utility buildings, farm buildings, etc., or the construction of heavy constructions such as highways, streets, bridges, tunnels, railways, airfields, harbours and other water projects, irrigations systems, sewerage systems, industrial facilities, pipelines and electric lines, sports facilities, etc. This work can be carried out on own account or on a fee or contract basis. Portions of the work and sometimes even the whole practical work can be subcontracted out to trade contractors.

Special trade construction includes the construction of parts of the above-mentioned works or preparation therefor. It is usually specialized in one aspect common to different structures, requiring specialized skills or equipment. Activities such as pile-driving, foundation work, water well drilling, carcass work, concrete work, bricklaying, stone setting, scaffolding, roof covering, etc., are covered. The erection of steel structures is included provided that the parts are not produced by the same unit. Special trade construction will mostly be carried out under subcontract, but especially in repair construction it is done directly for the owner of the property.

Exclusions: Landscape planning and design, lawn and garden installation and maintenance and tree surgeons activities are classified in class 0140 (Agriculture and animal husbandry service activities, except veterinary activities). Construction activities directly related to extraction of oil and natural gas are classified in class 1120 (Service activities incidental to oil and gas extraction excluding surveying). However, the construction of buildings, roads, etc., on the mining site remains in this class. The erection of complete prefabricated buildings or structures from self-manufactured parts is classified in the relevant category in manufacturing, depending on the material chiefly used, except if the chief material is concrete, in which case it remains classified here. The erection of metal structures from self-manufactured parts is classified in class 2811 (Manufacture of structural metal products). Special trade construction involving building installation and completion (finishing) are classified in class 4530 and 4540, respectively. Architectural and engineering activities are classified in class 7421 (Architectural and engineering activities and related technical consultancy). Project management for construction is also classified in class 7421.

453 4530 Building installation

This class includes the installation of all kind of utilities that do the construction function as such. These activities are usually performed at the site of the construction, although parts of the job may be carried out in a special shop. Included are activities such as plumbing, installation of heating and air-conditioning systems, antennas, alarm systems and other electrical work, sprinkler systems, elevators and escalators, etc. Also included are insulation work (water, heat, sound), sheet metal work, industrial process piping work, commercial refrigerating work, the installation of illumination and signalling systems for roads, railways, airports, harbours, etc., and the installation of certain plants such as electrical power and transformer plants, telecommunication and radar plants, etc. Also repair of the same type as the above-mentioned activities is included.

454 4540 Building completion

This class includes many different activities that contribute to the completion or finishing of a construction such as glazing, plastering, painting and decorating, floor and wall tiling or covering with other materials like parquet, carpets, wallpaper, etc., floor sanding, finish carpentry, acoustical work, cleaning of the exterior, etc. Also repair of the same type as the above-mentioned activities is included.

Exclusions: The installation of self-manufactured carpentry or joinery is classified in the relevant category in manufacturing, depending on the materials used, e.g. of wood in 2022 (Manufacture of builders' carpentry and joinery). Cleaning of windows, inside as well as outside, chimneys, boilers, interiors, etc., is classified in class 7493 (Building-cleaning activities).

455 4550 Renting of construction or demolition equipment with operator

This class includes the rental of construction machinery and equipment (including crane lorries) with operator.

Exclusions: Renting of construction machinery and equipment without operator is classified in class 7122 (Renting of construction and civil engineering machinery and equipment).

Annex II

EXTRACTS* FROM SYSTEM OF NATIONAL ACCOUNTS, 1993

- 4.66
Non-profit institutions serving households (NPISHs)
- In some communities, NPISHs may be found which do not possess any legal status or formal articles of association. They should be treated as NPISHs when they perform the same kinds of functions as the societies, parties, unions, etc., described above, even if they are not legally constituted as NPISHs. However, when groups of households collaborate on communal construction projects (such as construction of buildings, roads, bridges, ditches, dykes, etc.), they should be treated as informal partnerships engaged on own-account construction rather than NPISHs. NPISHs should normally have a continuing role to play and not be deemed to be created for single projects of limited duration.
- 6.47
Own-account gross fixed capital formation
- Goods or services used for own gross fixed capital formation can be produced by any kind of enterprise, whether corporate or unincorporated. They include, for example, the special machine tools produced for their own use by engineering enterprises, or dwellings, or extensions to dwellings, produced by households. A wide range of construction activities may be undertaken for the purpose of own gross fixed capital formation in rural areas in some countries, including communal constructions activities undertaken by groups of households.
- 6.86
Valuation of own-account fixed capital formation
- It will usually be necessary to value the output of own-account constructions on the basis of costs as it is likely to be difficult to make a direct valuation of an individual and specific construction project that is not offered for sale. When the construction is undertaken for itself by a business enterprise, the requisite information on costs may be easily ascertained, but not in the case of the construction of dwellings by households or communal construction for the benefit of the community undertaken by informal associations or groups of households. Most of the inputs into communal construction projects, including labour inputs, are likely to be provided free so that even the valuation of the inputs may pose problems. As unpaid labour may account for a large part of the inputs it is important to make some estimate of its value using wage rates paid for similar kinds of work on local labour markets. While it may be difficult to find an appropriate rate, it is likely to be less difficult than trying to make a direct valuation of a specific construction project itself.

- 10.73
Treatment of work-in-progress
- Many construction projects take a long time to complete. Until such time as the ownership of at least some of the output produced is transferred to the eventual user of the structure, no gross fixed capital formation can take place. Output that is not so transferred and continues to belong to the builder or construction enterprise must be recorded as either work-in-progress or as an addition to inventories of finished goods, depending on whether the construction is finished or not.
- 10.74
Transfer of ownership in stages
- When the construction takes place under a contract of sale agreed in advance, the ownership of the structure is effectively transferred in stages as the work proceeds. The value of the output transferred at each stage under such a contract is recorded as gross fixed capital formations by the purchaser.
- 10.75
Transfer of construction work in stages
- When there is no contract of sale agreed in advance, the output produced by the construction enterprise must be recorded as work-in-progress or as additions to the producers' inventories of goods, depending on whether the construction is completed. For example, finished dwellings built speculatively remain as additions to producers' inventories of finished goods until they are sold or otherwise acquired by users.
- 10.78
Valuation of construction
- In principle, the finished structure should be valued at its estimated basic price. If the structure is not completed within a single accounting period, the value of the output and corresponding gross fixed capital formation should be estimated by applying the fraction of the total costs of production incurred during the relevant period to the estimated current basic price. If it is not possible to estimate the basic price of the finished structure, it must be valued by its total costs of production, with a mark-up for operating surplus. If some or all of the labour is provided free, as may happen with communal construction by households, an estimate of what the cost of paid labour would be must be included in the estimated total production costs using wage rates for similar kinds of labour in the vicinity or region. Otherwise, the value of the finished structure will be seriously underestimated.
- 10.79
Transfer of ownership of community construction to government
- Certain structures may be produced for own communal use by groups of households: for example, buildings, roads, bridges, etc. After they are finished, the ownership of such structures may then be transferred to some government unit that assumes responsibility for their maintenance. When the transfer occurs, the gross fixed capital formation on own account originally attributed to the group of households is cancelled by their negative gross fixed capital formation resulting from the capital transfer in kind they make to the government unit. The final gross fixed capital formation remaining is that of the government unit resulting from its acquisition of the asset through the capital transfer in kind.

14.23

Extraterritorial
construction

Production undertaken by the personnel (and plant and equipment) of a resident unit outside its economic territory is to be treated as part of the production of the host country and the unit treated as a resident unit (branch or subsidiary) of that country if it meets the conditions noted above (see paragraph). Such a unit usually maintains a complete and separate set of accounts of local activities (i.e., income statement, balance sheet, transactions with the parent enterprise), pays income taxes to the host country, has a substantial physical presence, receives funds for its work for its own account, etc. The above considerations also apply to the particular case of construction activity carried out abroad by a resident producer. If they are not present, the activity should be classified as an export of services by the resident enterprise. Production can generate such an export only if the production is classified as domestic production (undertaken by a resident even though the physical process takes place outside the economic territory). Construction involved with major specific projects - bridges, dams, power stations, etc. - that often takes several years to complete, and is carried out and managed by non-resident units through an unincorporated site office in an economy warrants special mention. In most instances, such a site office will meet the criteria that require its production to be treated as a resident unit and to be part of the production of the host economy (as would that of a branch or affiliate), rather than as an export of services to that economy (for further discussion and treatment of installation projects, see paragraphs 14.101 and 14.102 below).

14.100

Construction by
non-resident
corporations

The treatment of international construction raises the same issues as those discussed in paragraphs 14.95 to 14.98 above with reference to business consultancy or other services. Contracts for the construction of major projects such as bridges, power stations, or dams are frequently awarded to non-resident corporations. When a construction corporation in country A is awarded a contract in country B, the corporation is obliged to create a site office in country B from which the construction is managed and carried out, in much the same way that a corporation exporting services may have to open a branch office abroad. Although the site office may have no separate legal identity, it may nevertheless be treated as a quasi-corporation for this purpose. The main argument against this treatment is that the site office is created for the duration of a specific project and is dismantled when the project terminates. Thus, it cannot be interpreted as evidence of a lasting economic interest in country B by the corporation.

14.101

If a site office is not treated as a quasi-corporation, the consequences are that the construction site has to be treated as an enclave of country A inside of country B which is similar to that of an embassy or military base maintained by country A. The value added inside the enclave can then be treated as part of the GDP^b of country A and the value of the final output produced, i.e., the dam or bridge itself, is treated as an export from country A to country B. In line with the general principles applied to the measurement of the output of construction, the dam or bridge can be treated as being completed and delivered to the client in stages. While this solution has some merit, it has the serious disadvantage that the value added generated by a major construction project, such as the construction of a dam or bridge which may last several years, is not attributed to the country in which the activity actually takes place. This seems particularly anomalous when most of the labour and materials employed on the project are likely to be supplied locally, while the project itself is likely to have an important impact on incomes and expenditures in the locality. For this reason the System recommends that quasi-corporations should be created for major constructions/projects which last for a year or more (subject to the considerations noted in paragraph 14.23 above), even though there may be no lasting economic interest in the country by the construction unit.

14.102

The consequence of creating a quasi-corporation unit for a construction project undertaken in country B in the above example is that the only exports which are recorded from country A to country B are the goods and services supplied from country A which are incorporated into the final structure: for example, surveyors' plans prepared in country A or turbines or other hydroelectric equipment manufactured in country A which are installed in the dam in country B. Although there may be no change of legal ownership when the parent construction corporation in country A ships equipment to its own construction site located in country B, the system imputes a change of ownership for deliveries of goods to branches or subsidiaries abroad which are not returned. The project may also generate important international flows of income, including compensation of employees, as well as profits and financial flows, but these are not exports or imports of goods and services.

Notes

^a Paragraphs are numbered as in the 1993 SNA. The titles in the left margin are added.

^b Gross domestic product.

Annex III

EXTRACT FROM PROVISIONAL CENTRAL PRODUCT CLASSIFICATION (CPC) [5]

DIVISION 52 CONSTRUCTIONS

Residential buildings, non-residential buildings and civil engineering works completed or work in progress during the inquiry period.

Products classified here are non-transportable goods or, in the SNA terminology, fixed tangible assets, and their production may constitute fixed capital formation.

521 Buildings

5211 Residential buildings

52111 One- and two-dwelling buildings

Residential buildings with one or two dwellings.

52119 Other residential buildings

Residential buildings with three or more dwellings.

5212 Non-residential buildings

52121 Warehouses and industrial buildings

Buildings used to house warehousing activities and the production and assembly activities of industrial establishments, for example, factories, plants, workshops.

Exclusion: Non-residential farm buildings are classified in subclass 52129 (Other buildings).

52122 Commercial buildings

Commercial buildings, including office buildings, bank buildings, buildings used primarily in wholesale and retail trades, for example, shops, air, rail or road transport terminals, parking garages and petrol and service stations.

52123 Buildings for public entertainment

Buildings for public entertainment, for example, theatres, concert halls, motion picture theatres, dance halls and nightclubs.

Exclusions: Museums, art galleries, libraries and similar buildings are classified in subclass 52125 (Educational buildings).

52124 Hotel, restaurant and similar buildings

Hotels, restaurants and other buildings used in providing short-term lodging, food and beverages.

52125 Educational buildings

Buildings used directly in instructional activities, for example, schools, universities, museums, art galleries, libraries.

52126 Health buildings

Buildings used to provide hospital and institutional care, for example, hospitals, infirmaries, sanatoriums, nursing homes.

52129 Other buildings

Buildings, not elsewhere classified, for example, religious buildings, community buildings, non-residential farm buildings.

Exclusions: Constructions for sport and recreation are classified in class 5227.

522 Civil engineering works

5221 Highways (except elevated highways), streets, roads, railways, airfield runways

52211 Highways (except elevated highways), streets, roads

Highways (except elevated highways), streets, roads and other vehicular and pedestrian ways. Guard rails and surfaced parking areas, driveways, vehicular or pedestrian underpasses and overpasses, and bicycle paths.

Exclusion: Elevated highways and highway tunnels are classified in subclass 52222 and 52223, respectively.

52212 Railways

Railway roadbeds for long-line and commuter railways, street tramways, and underground or elevated urban rapid transit systems. Railway electrification structures are included.

Exclusion: Other subway constructions are classified in subclass 52224 (Subways).

52213 Airfield runways

Airfield runways, including taxiways and related airport structures other than buildings.

5222 Bridges, elevated highways, tunnels and subways

52221 Bridges

Bridges and viaducts of metal, concrete or other materials, for all types of land transport and for pedestrians.

52222 Elevated highways

Elevated highways for motor vehicle traffic.

52223 Tunnels

Highway and railway tunnels (except for underground railways) and tunnel construction-related works.

Exclusions: Vehicular and pedestrian underpasses are classified in subclass 52211 (Highways (except elevated highways), streets, roads).

Underground railways are classified in subclass 52224 (Subways).

Tunnels associated with mining operations are classified in subclass 52261 (Mining constructions).

52224 Subways

Tunnel constructions and other underground constructions related to underground railway traffic.

5223 Waterways, harbours, dams and other waterworks

52231 Aqueducts and other water supply conduits, except pipelines

Aqueducts, water conduits and similar waterways designed to convey water for the purpose of water supply, except pipelines.

Exclusions: Waterworks for irrigation or flood control are classified in subclass 52234.

Long-distance pipelines and local pipelines are classified in subclass 52241 and subclass 52250, respectively.

52232 Harbours, rivers, canals, and related facilities

Harbour bottoms and harbour channels, breakwaters, piers, wharfs and similar structures, and river works and canal constructions for water transport traffic.

52233 Dams

Dams and similar water-retaining structures and embankments for coastal and other waterside areas.

52234 Irrigation and flood control waterworks

Irrigation and flood control waterworks.

Exclusions: Waterways for the purpose of water supply are classified in subclass 52231 (Aqueducts and other water supply conduits, except pipelines).

5224 Long distance pipelines, communication and power lines (cables)

52241 Long distance pipelines

Long-distance overland or submarine pipelines for the conveyance of petroleum products, gas, water or other products.

Exclusion: Urban gas or water distribution systems through mains are classified in subclass 52250 (Local pipelines and cables; ancillary works).

52242 Communication lines (television, radio, telegraph, telephone and other transmission lines)

Long-distance overland or submarine telecommunications transmission lines, in other words, television, radio, telegraph, telephone and other transmission lines.

52243 Power lines (cables)

Long-distance high-tension electric power transmission lines (cables).

Exclusion: Low-tension electric power distribution lines are classified in subclass 52250 (Local pipelines and cables; ancillary works).

5225 52250 Local pipelines and cables; ancillary works

Local gas pipelines, water and sewer mains, and local power and communication transmission lines (cables).

Ancillary works such as transmission towers including antennae and transformer stations and substations for distribution within local boundaries. Local public utility systems, not elsewhere classified.

5226 Constructions for mining and manufacture

52261 Mining constructions

Mining and related facilities, such as mine loading and discharging stations, winding shafts and towers, tunnels and drifts associated with mining operations.

52262 Power plant constructions

Heavy electrical generating plants and equipment including plants and equipment for nuclear-powered generating stations.

52263 Chemical and related facilities

Chemical and related plant facilities, for example, blast furnaces and coke ovens, for manufacture of basic chemicals, compounds, pharmaceuticals and other chemicals.

Exclusion: Industrial buildings that are not specialized for the manufacture of particular products are classified in subclass 52121 (Warehouses and industrial buildings).

52269 Other constructions for manufacture

Specialized facilities for manufacture, not elsewhere classified, for example, iron foundries.

Exclusion: Industrial buildings that are not specialized for the manufacture of particular products are classified in subclass 52121 (Warehouses and industrial buildings).

5227 Constructions for sport and recreation

52271 Stadia, sports grounds

Stadiums and other grounds for sports generally played in the open air such as football, baseball, rugby, track and field, car or bicycle races and horse races. Stadiums generally provide substantial seating and/or standing accommodation for spectators.

52279 Other sport and recreation installations (e.g. swimming pools, tennis courts, golf courses)

Other sport and recreation installations. The sport installations classified here are mostly for indoor sports and provide limited seating or other accommodation for spectators, for example, basketball courts, ice hockey rinks, swimming pools, tennis courts, gymnastic halls, boxing rings, skating rinks.

Recreation installations, for example, golf courses, beach installations, mountain refuges, marinas for pleasure boats, park grounds and recreational park facilities.

5229 52290 Other civil engineering works

Other civil engineering works, not elsewhere classified.



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