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## 867 Architectural, engineering and other technical services

#### 8671 Architectural services

#### 86711 Advisory and pre-design architectural services

Assistance, advisory and recommendation services concerning architectural and related matters. Included here are services as undertaking preliminary studies addressing issues such as site philosophy, intent of development, climatic and environmental concerns, occupancy requirements, cost constraints, site selection analysis, design and construction scheduling and any other issues affecting the nature of the design and construction of a project. The provision of these services is not necessarily related to a new construction project. For example, it may consist of advice concerning the means of carrying out maintenance, renovation, restoration or recycling of buildings, or appraisals of the value and quality of buildings or of advice on any other architectural matter.

## 86712 Architectural design services

Architectural design services for buildings and other structures. Design services may consist of one or a combination of the following: schematic design services, which consist of determining, with the client, the essential character of the project, defining intent, space requirements, budget limitations and time scheduling; and of preparing sketches including floor plans, site plans and exterior views; design development services, which consist of a more precise illustration of the design concept in terms of siting plan, form, material to be used, structural, mechanical and electrical systems and probable construction costs; final design services, which consist of drawings and written specifications sufficiently detailed for tender submission and construction, and of expert advice to the client at the time of calling for and accepting tenders.

#### 86713 Contract administration services

Advisory and technical assistance services to the client during the construction phase to ensure that the structure is being erected in conformity with the final drawings and specifications. This involves services provided both in offices and the field, such as construction inspection, preparation of progress reports, issuance of certificates for payments to the contractor, guidance to the client and the contractor in the interpretation of contract documents and any other advice on technical questions that may develop during construction.

## 86714 Combined architectural design and contract administration services

Combinations of architectural services utilized on most projects including schematic design, design development, final design and contract administration services. This may include post construction services which consist of the assessment of deficiencies in construction and instructions regarding corrective measures to be taken during the 12-month period following the completion of the construction.

#### 86719 Other architectural services

All other services requiring the expertise of architects, such as the preparation of promotional material and presentations, preparation of as-built drawings, constant site representation during the construction phase, provision of operating manuals, etc.

## 8672 Engineering services

## 86721 Advisory and consultative engineering services

Assistance, advisory and recommendation services concerning engineering matters. Included here are the undertaking of preparatory technical feasibility studies and project impact studies. Examples are: study of the impact of topography and geology on the design, construction and cost of a road, pipeline or other transportation infrastructure; study of the quality or suitability of materials intended for use in a construction project and the impact on design, construction and cost of using different materials; study of the environmental impact of a project; study of the efficiency gains in production as a result of alternative process, technology or plant layout. The provision of these services is not necessarily related to a construction project. It may consist, for example, of the appraisal of the structural, mechanical and electrical installations of buildings, of expert testimony in litigation cases, of assistance to government bodies in drafting laws, etc.

## 86722 Engineering design services for the construction of foundations and building structures

Structural engineering design services for the load-bearing framework of residential and commercial, industrial and institutional buildings. Design services consist of one or a combination of the following: preliminary plans, specifications and cost estimates to define the engineering design concept; final plans, specifications and cost estimates, including working drawings, specifications regarding materials to be used, method of installation, time limitations and other specifications necessary for tender submission and construction and expert advice to the client at the time of calling for and accepting tenders; services during the construction phase.

<u>Exclusion</u>: Engineering services for buildings if they are an integral part of the engineering design service for a civil work or production plant or facility.

# 86723 Engineering design services for mechanical and electrical installations for buildings

Mechanical and electrical engineering design services for the power system, lighting system, fire alarm system, communication system and other electrical installations for all types of buildings and/or the heating, ventilating, air conditioning, refrigeration and other mechanical installations for all types of buildings. Design services consist of one or a combination of the following: preliminary plans, specifications and cost estimates to define the engineering design concept; final plans, specifications and cost estimates, including working drawings, specifications regarding materials to be used, method of installation, time limitations and other specifications necessary for tender submission

and construction and expert advice to the client at the time of calling for and accepting tenders; services during the construction phase.

#### 86724 Engineering design services for the construction of civil engineering works

Engineering design services for the construction of civil engineering works, such as bridges and viaducts, dams, catchment basins, retaining walls, irrigation systems, flood control works, tunnels, highways and streets including interchanges and related works, locks, canals, wharves and harbours works, water supply and sanitation works such as water distribution systems, water, sewage, industrial and solid waste treatment plants and other civil engineering projects. Design services consist of one or a combination of the following: preliminary plans, specifications and cost estimates to define the engineering design concept; final plans, specifications and cost estimates, including working drawings, specifications regarding materials to be used, method of installation, time limitations and other specifications necessary for tender submission and construction and expert advice to the client at the time of calling for and accepting tenders; services during the construction phase. Included are engineering design services for buildings if they are an integral part of the engineering design for a civil engineering work.

## 86725 Engineering design services for industrial processes and production

Engineering design services for production processes, procedures and facilities. Included here are design services as they relate to methods of cutting, handling and transporting logs and logging site layout; mine development layout and underground construction, the complete civil, mechanical and electrical mine surface plant installations including hoists, compressors, pumping stations, crushers, conveyors and ore and waste-handling systems; oil and gas recovery procedures, the construction, installation and/or maintenance of drilling equipment, pumping stations, treating and storage facilities and other oil field facilities; materials flows, equipment layout, material handling systems, processes and process control (which may integrate computer technology) for manufacturing plants; special machinery, equipment and instrumentation systems; any other design services for production procedures and facilities. Design services consist of one or a combination of the following: preliminary plans, specifications and cost estimates to define the engineering design concept; final plans, specifications and cost estimates, including working drawings, specifications regarding materials to be used, method of construction and/or installation, time limitations and other specifications necessary for tender submission and construction and expert advice to the client at the time of calling for and accepting tenders; services during the installation phase. Included are engineering design services for buildings if they are an integral part of the engineering design service for a production plant or facility.

#### 86726 Engineering design services n.e.c.

Other specialty engineering design services. Included here are acoustical and vibration engineering designs, traffic control systems designs, prototype development and detailed designs for new products and any other specialty engineering design services.

<u>Exclusion</u>: The aesthetic design of products and the complete design of products which do not require complex engineering (e.g. furniture) are classified in subclass 87907 (Specialty design services).

## 86727 Other engineering services during the construction and installation phase

Advisory and technical assistance services to the client during construction to ensure that construction work is in conformity with the final design. This involves services provided both in offices and in the field, such as the review of shop drawings, periodic visits to the site to assess progress and quality of the work, guiding the client and the contractor in the interpretation of contract documents and any other advice on technical questions that may develop during construction.

## 86729 Other engineering services

Engineering services not elsewhere classified. Included here are geotechnical engineering services providing engineers and architects with necessary subsurface information to design various projects; groundwater engineering services including groundwater resources assessment, contamination studies and quality management; corrosion engineering services including inspection, detection and corrosion control programmes; failure investigations and other services requiring the expertise of engineers.

## 8673 Integrated engineering services

# 86731 <u>Integrated engineering services for transportation infrastructure turnkey projects</u>

Fully integrated engineering services for the construction of transportation infrastructure turnkey projects. Services included here are planning and pre-investment studies, preliminary and final design, cost estimation, construction scheduling, inspection and acceptance of contract work as well as technical services, such as the selection and training of personnel and the provision of operation and maintenance manuals and any other engineering services provided to the client that form part of an integrated bundle of services for a turnkey project.

# 86732 <u>Integrated engineering and project management services for water supply</u> and sanitation works turnkey projects

Fully integrated engineering services for the construction of water supply and sanitation works turnkey projects. Services included here are planning and pre-investment studies, preliminary and final design, cost estimation, construction scheduling, inspection and acceptance of contracts as well as technical services, such as the selection and training of personnel and the provision of operation and

maintenance manuals and any other engineering services provided to the client that form part of an integrated bundle of services for a turnkey project.

# 86733 <u>Integrated engineering services for the construction of manufacturing turnkey projects</u>

Fully integrated engineering services for the construction of manufacturing facilities turnkey projects. Services included here are planning and pre-investment studies to address issues such as the integration of operations, site selection, pollution and effluent control and capital requirements; all necessary structural, mechanical and electrical design services; production process engineering design services including detailed process flow diagrams, general site and plant arrangement drawings, plant and equipment specifications; tender specifications; construction scheduling inspection and acceptance of work as well as technical services, such as the selection and training of personnel, the provision of operations and maintenance manuals, start-up assistance and any other engineering services that form part of an integrated bundle of services for a turnkey project.

## 86739 Integrated engineering services for other turnkey projects

Fully integrated engineering services for other construction works. Services included here are planning and pre-investment studies, preliminary and final design, cost estimates, construction scheduling, inspection and acceptance of contracts as well as technical services, such as the selection and training of personnel and the provision of operation and maintenance manuals and any other engineering services provided to the client that form part of an integrated bundle of services for a turnkey project.

## 8674 Urban planning and landscape architectural services

#### 86741 <u>Urban planning services</u>

Development services of programme regarding land use, site selection, control and utilization, road systems and servicing of land with a view to creating and maintaining systematic, coordinated urban development.

#### 86742 Landscape architectural services

Plan and design services for the aesthetic landscaping of parks, commercial and residential land, etc. This implies preparing site plans, working drawings, specifications and cost estimates for land development, showing ground contours, vegetation to be planted, and facilities such as walks, fences and parking areas. Also included are inspection services of the work during construction.

## 8675 Related scientific and technical consulting services

## 86751 Geological, geophysical and other scientific prospecting services

Geological, geophysical, geochemical and other scientific consulting services as they relate to the location of mineral deposits, oil and gas and groundwater by studying the properties of the earth and rock formations and structures. Included here are the services of analysing the results of subsurface surveys, the study of earth sample and core, and assistance and advice in developing and extracting mineral resources.

## 86752 Subsurface surveying services

Gathering services of information on subsurface earth formations by different methods, including seismographic, gravimetric, magnetometric and other subsurface surveying methods.

## 86753 Surface surveying services

Gathering services of information on the shape, position and/or boundaries of a portion of the earth's surface by different methods, including transit, photogrammetric and hydrographic surveying, for the purpose of preparing maps.

#### 86754 Map-making services

Map-making services consisting in the preparation and revision of maps of all kinds (e.g. road, cadastral, topographic, planimetric, hydrographic) using results of survey activities, other maps, and other information sources.

#### 8676 Technical testing and analysis services

#### 86761 Composition and purity testing and analysis services

Testing and analysis services of the chemical and biological properties of materials such as air, water, waste (municipal and industrial), fuels, metal, soil, minerals, food and chemicals. Included are testing and analysis services in related scientific fields such as microbiology, biochemistry, bacteriology, etc. Excluded are medical and dental testing services.

## 86762 Testing and analysis services of physical properties

Testing and analysis services of physical properties such as strength, ductility, electrical conductivity and radioactivity of materials such as metal, plastics, textiles, woods, glass, concrete and other materials. Included are tests for tension, hardness, impact resistance, fatigue resistance, and high-temperature effects.

## 86763 <u>Testing and analysis services of integrated mechanical and electrical</u> systems

Testing and analysis services of the mechanical and electrical characteristics of complete machinery, motors, automobiles, tools, appliances, communication equipment and other equipment incorporating mechanical and electrical components. The results of the testing and analysis generally take the form of an assessment of the performance and behavioural characteristics of the object tested. Tests may be performed using models or mock-ups of ships, aircraft, dams, etc.

## 86764 Technical inspection services

Testing and analysis services of a technical or scientific nature which do not alter or affect the object being tested. Included are radiographic, magnetic, and ultrasonic testing of machine parts and structures conducted in order to identify defects. These tests are often conducted on site. Excluded are inspection services of a non-technical or scientific nature, such as visual inspection of buildings, machines, etc.

## 86769 Other technical testing and analysis services

All other technical testing and analysis services not elsewhere classified.

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