

**Description of Services**

# **Building and Planning**

# 2012



**Danish Association of  
Consulting Engineers**

**DANSKE  
ARKITEKT  
VIRKSOMHEDER**

The Danish Association of Consulting Engineers (FRI) and the Danish Association of Architectural Firms (DANSKE ARK)

## **Service descriptions for Building and Planning**

This description of services serves as a basis for providing consultancy in connection with building and planning.

The consultant's services and fees are contractually based on *ABR 89* ("*General Conditions for Consulting Services*").

Agreements should be drawn up in a form corresponding to the standard agreement form prepared by FRI (Danish Association of Consulting Engineers), and DANSKE ARK (Danish Association of Architectural Firms).

It should be noted that services provided by the consultant comprise only services within the consultant's field as expressly specified in the consultancy agreement.

The description of services does not refer to legislation and regulations governing specific building projects or public sector building projects. Such legislation and regulations are assumed to serve as the basis for the actual building project.

The description of services is prepared with a view to defining roles and the division of services between consultants and client, and between individual consultants.

Moreover, the description of services is prepared in particular with a view to defining responsibility and services for design manager, design consultants, project follow-up, construction management and technical supervision. The description of services is also to be used for both large and small-scale – complex and less complex – building projects as a frame of reference for determining services in the specific consultancy agreement.

Chapter 9 contains a glossary which describes selected terms used in the description of services and/or in the industry.

In the case of agreements for digital design and digital deliveries, an ICT specification should be drawn up, possibly in accordance with the 'bips' (construction – IT – productivity – cooperation) publication F202 and related project-specific description.

The ICT specification defines the digital delivery of the agreed project documentation.

FRI and DANSKE ARK issue individual codes of practice for a number of specific areas.

DANSKE ARK has issued "Byfornyelse" (Urban Renewal), "Produktudvikling" (Product Development), "Ydelsesbeskrivelse for arbejdsmiljø på byggepladsen" (Description of Services for Occupational Health and Safety on Building Sites), and "Anvisning til bæredygtig projektering" (Guide to Sustainable Design).

FRI has compiled "Vejledning om arbejdsmiljø i byggeprocessen" (Guidelines on Occupational Safety in the Construction Process).

DANSKE ARK and FRI have drawn up joint descriptions of services for "Bygherrerådgivning" (Client Consultancy), "Anlæg og Planlægning" (Construction and Planning) and "Som udført" (As Built), 2000.

Reference is made to the websites of the organisations at [www.danskeark.dk](http://www.danskeark.dk) and [www.frinet.dk](http://www.frinet.dk) for the latest versions of the publications.

The codes of practice of other organisations may also be relevant, e.g.: "Møbeludvikling og produkt design" (Furniture Development and Product Design) (Danish Designers).

The general organisation of the building project, including calls for tender for a specialist, large, general, turnkey or partnering contract, is not described. Reference is made to the description of services for "Client Consultancy" in this respect.

Praktiserende Landskabsarkitekter Råd (PLR) has been dissolved as of 31 December 2011. The majority of PLR's former members have been admitted as members of the Danish Association of Architectural Firms (DANSKE ARK).

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## 9 Glossary

## 0. Role of consultant

The consultant is the client's independent representative and adviser, see ABR 89 (article 1.1, Work of the Consultant). The services provided by the consultant in connection with building and planning projects comprise both architect-specific, landscape architect-specific and engineer-specific services.

The consultant is trained specifically to manage architecture, technical solution, programming and costing in planning tasks and building projects and also manages the human, aesthetic and functional aspects of a holistic solution.

Consultancy may be provided in the following forms:

- 0.1 Client consultancy
- 0.2 Full-service consultancy
- 0.3 Split consultancy
- 0.4 Sub-consultancy

### 0.1 CLIENT CONSULTANCY

As consultant to the client, the consultant safeguards the interests of the client in matters involving the designers and the contractors.

Consultancy may include the appraisal and conceptual phases and/or may cover the full design and construction periods.

Reference is made to the relevant description of services.

### 0.2 FULL-SERVICE CONSULTANCY

When a full-service consultant is responsible for the entire project, the client only needs to enter into a single consultancy agreement.

The full-service consultant engages the services of required sub-consultants and is responsible to the client for their work.

Full-service consultancy may also be provided by a group of consultants.

The full-service consultant appoints the design manager, who is responsible for client relations.

### 0.3 SPLIT CONSULTANCY

Each consultant concludes a separate agreement with the client. The consultants are under an obligation to cooperate with each other, but have no direct contractual obligation to each other.

The client is responsible for consultancy management and coordination and for interaction between the consultants. The client may delegate this responsibility to a design manager (see (2)).

The client appoints the design manager in dialogue with the consultants. The design manager handles relations between the client and the consultants.

### 0.4 SUB-CONSULTANCY

As sub-consultant, the consultant concludes an agreement only with 'his' client, usually the full-service consultant.

The sub-consultant is in contact with the design manager and the client through this party.

## 1. Initial consultancy

Initial consultancy encompasses:

- 1.1 Appraisal
- 1.2 Design specification

The scope of services to be provided depends on the current project and the client's needs and is determined in cooperation with the client on the basis of a proposal from the consultant.

In the case of buildings subject to the "Lov om offentlig byggevirksomhed" and associated regulations on the use of ICT in construction, the consultant must comply with the requirements pursuant to sections 8.1, 8.2 and 8.4 - 8.7 of the description of services, as specified in the consultancy agreement and associated ICT specification.

### 1.1 APPRAISAL

The appraisal represents an initial processing of the client's thoughts, ideas and requirements, with a view to a decision on whether or not to implement the task.

#### 1.1.1 Contents

The initial work on the client's ideas is presented in a report. This report analyses the potential of the client's ideas and assesses whether and how these ideas can be implemented. The appraisal may include alternatives to the client's ideas.

The necessary planning and relevant investigations of existing conditions, including research in archives, are summarised in the appraisal.

The appraisal should also include relevant information about the intended building site, including details of soil conditions, pollution, etc.

The appraisal may also include considerations of alternative suggestions regarding location, construction possibilities, etc.

The appraisal may include accounts of the outcome of negotiations conducted.

The appraisal may include an analysis of needs and functions, including an analysis of accessibility conditions.

The appraisal should include an account of the client's expectations towards the sustainability and energy needs of the building.

The appraisal may contain an analysis of landscape history, topography, fauna, climate, etc.

The appraisal may include a risk analysis focusing on quality, programming, costing, etc.

The appraisal must include an organisational chart for the building project. An account must be given of how decisions are made, including any need for hearings and user influence in connection with the design specification.

The appraisal must contain an assessment of the need for special advisers.

#### 1.1.2 Project

The appraisal may include existing drawings detailing the site's location and size as well as particulars of its nature, site development, plot ratios, easements, profit and restrictive covenants, zoning, etc.

If no drawings are available, the client may allow the consultant to arrange for existing open spaces, buildings and facilities to be registered, measured, drawn and digitalised.

For refurbishment projects, the appraisal may include surveys for the programme work including an account of the use of the buildings, the environmental conditions of the area, the combination of materials used in the buildings as well as a structural survey.

#### 1.1.3 Programming

The appraisal may include a timeframe for the completion of the project, including particularly critical milestones such as deadlines for commitment to site acquisition.

#### 1.1.4 Cost management

The appraisal may include proposals for budget limits in connection with project implementation, including an estimate of total construction costs, site acquisition costs, other costs, etc.

The appraisal may include an account of the client's expectations towards the implementation of operational and overall economic considerations, and documentation of this in connection with the realisation of the task.

#### 1.1.5 Authorities

The appraisal may include a section on regulatory matters and proposals for consideration of other regulatory aspects, including zoning.

#### 1.1.6 Quality assurance

The consultant reviews the appraisal and its basis.

#### 1.1.7 Client

The client obtains existing drawings, property information, etc.

The client participates actively in the necessary meetings and provides information about the possibilities of completing the project in terms of costs as well as information about profit targets, if any.

Having assessed the documentation and its conclusions, the client decides whether further details are needed to supplement the documentation or whether it can form the basis for preparing a design specification.

If the client involves other consultants, such involvement must be coordinated with the lead consultant.

The client approves the appraisal before the beginning of the design specification.

If the design specification is to form the basis for tendering, the client decides on the type of tendering procedure.

### 1.2 DESIGN SPECIFICATION

The design specification is a coordinated summary of the client's requirements and wishes for the building project.

The level of detail of the design specification is adjusted to match the organisation of the building project.

#### 1.2.1 Contents

The design specification is prepared on the basis of the appraisal, which lists the necessary conditions for the further development of the project.

The design specification may be prepared as a description (possibly in a schematic form) specifying the physical requirements for open spaces, structures, MEP services and surface quality as well as the sustainability objectives to be met.

If required, a statement of preliminary investigations is prepared in cooperation with other consultants, listing the basic conditions of the buildings: these may include geological, environmental, topographical or climatic conditions, archaeology, area conditions or legal matters, as well as specific regulatory requirements, existing public utilities, operation and maintenance, etc.

The design specification must include a specification of any requirements the client may have for digital design and the delivery of digital project and operational data. This is stated in an ICT specification.

The design specification must furthermore define objectives and requirements for the preparation of one or more building models as a basis for client reviews and user consultation, etc., during the construction phases.

The design specification must include an organisational chart as well as procedures for communication and cooperation between the parties involved in the building project. In digital design, any requirements towards the use of a common digital communication platform for the exchange and sharing of project documentation are defined.

The consultant draws up a draft plan for project decisions and approvals to be obtained from the client by the designers.

The consultant, in collaboration with the client, may organise user consultation, etc., and the design specification must include a description

of the client's expectations regarding user consultation during design and construction, and regarding the designers' services in this connection.

The consultant informs the client of the client's responsibilities in relation to health and safety legislation, including requirements for the involvement of working environment coordinators during design and construction, respectively.

The design specification must state any special requirements towards health and safety requirements and working environment coordination during the design, construction and operation.

The design specification must state any special requirements for accessibility in addition to those contained in Danish building regulations and other legislation.

The design specification must state any special requirements towards the thermal, atmospheric, acoustic or optical indoor climate in addition to those contained in Danish building regulations and other legislation.

The design specification must state any special requirements towards energy needs and specify any related assumptions.

The design specification must state any special sustainability requirements, and specific goals must be defined, including any certification requirements.

If the appraisal contains no analysis of needs and functions, such analysis may be included in the design specification.

If the building project involves many different types of room, room descriptions may be drawn up in schematic form or as a requirements model specifying the net area of such rooms, furnishing needs, technical installation requirements, etc.

The design specification may include a risk analysis focusing on quality, programming, costing, etc., and must, if included, assess the need for special risk management activities during the design and construction phases.

The design specification must include an overall assessment of the operational conditions.

The design specification must include the QA requirements for design and construction, including requirements for supervision and construction management.

### 1.2.2 Project

The nature of the project may call for the preparation of preliminary designs of rooms indicating principles of function and diagrams giving details such as area sizes, functional relationships and proximity criteria.

The gross and net areas of the buildings are assessed.

Drawings are not generally made, but drawings of any existing buildings and facilities should be included.

### 1.2.3 Programming

The design specification includes an assessment of the project's timeframe for design and construction, including the progress of individual phases, review by the authorities, health and safety legislation requirements, approvals, etc.

### 1.2.4 Cost management

An overall budget is drawn up for the building project.

The budget limits are normally divided into the following main items:

- site acquisition
- demolition and clearing
- building and landscaping costs
- fittings, fixtures and equipment
- other costs
- VAT.

Available funds are set aside for contingencies, building site costs and winter conditions likely to occur during the building project.

The budget must contain information about the price index used and the price adjustments expected.

### 1.2.5 Authorities

Information about general regulatory requirements, including zoning, easements and restrictive covenants, title documentation, levelling survey, environmental conditions and



public utility connections, as well as particulars of site use, traffic and road conditions and accessibility conditions are obtained in cooperation with the client. These details are included in the design specification.

#### **1.2.6 Quality assurance**

The consultant reviews the design specification and its basis systematically to ensure that requirements for the quality of the buildings (form, function, technology) and for costs and programming are adequately described to form the basis for drawing up a proposal.

#### **1.2.7 Client**

The client assists in initiating functional analyses, assessing the need for premises, preparing budget limits, etc. If required, the client appoints user representatives and defines their responsibilities.

Together with the consultant, the client must ensure that:

- a design specification is prepared before the design process begins
- a description of consultancy services is drawn up
- any requirements for classification, digital communication, digital design, digital tendering or digital delivery of project and operational data are laid down in the form of an ICT services specification
- the quality level of the buildings is determined, taking account of their intended purpose
- programme requirements are consistent with construction and operating finances, and
- sufficient time has been set aside for design, tendering and construction.

The client must decide on the extent to which its tasks in pursuance of health and safety regulations can be assigned to a third party, including the provision of working environment coordination, during design and construction, respectively.

The client approves the design specification as a basis for starting the design process.

## 2. Design management consultancy

Design management consultancy comprises the following services:

### 2.1 Design management

Including:

#### 2.2 ICT management in tasks where digital design has been agreed

ICT management is undertaken as part of the design management process, and the ICT manager reports to the design management.

If one consultant handles the overall task, this consultant will be responsible for the design management.

The client may, as agreed between the parties, be responsible for design management.

### 2.1 DESIGN MANAGEMENT

The design manager handles relations between the client and consultants, including any design suppliers and contractors.

#### 2.1.1 Contents

The design manager is responsible for cooperation between the consultants and ensures coordination of project work performed by the individual consultants, with particular focus on interfaces. This is also the case if design work is performed by suppliers or contractors.

The design manager undertakes the coordination of the building's architecture, landscaping, structures and installations.

The design manager also coordinates in relation to the building's sustainability goals.

The design manager checks that the client has arranged for competence and responsibility to be delegated, has established ways of

communication, and that an approved design specification has been prepared.

The design manager determines the form of contract in concert with the individual consultants and the client; this work includes defining the responsibilities of the consultants on the basis of agreements concluded with the client.

The design manager draws up an organisational chart for design and project follow-up.

The design manager is responsible for ensuring that the client receives adequate information, that the client is provided with a basis on which to make decisions and that any approvals and decisions made by the client are communicated to the consultants.

The design manager arranges for approved drawing and description principles to be used.

The design manager convenes and presides at design meetings and any required meetings with the client during the design phase and also prepares minutes.

The design manager recommends the type of tendering procedure and the allocation of contracts to the client, and coordinates the process of inviting tenders.

The design manager prepares the tender conditions, tender letter and construction contract.

The design manager prepares a description of the building project on the basis of proposals made by the consultants.

The design manager ensures that the building project description, along with the consultants' work descriptions, defines the scopes of work and interfaces between the consultants and the designing suppliers and contractors after contracting, including any joint design work performed by the consultant and the suppliers and contractors.

The design manager coordinates services to be provided by the consultants as stipulated in health and safety legislation.

The design manager ensures that the working environment coordinator is informed of the design choices, MEP principles, choice of materials, site plan, any particularly hazardous work, machinery needed in the construction phase, the scope of safety measures, etc.

The design manager presents the full tender documents to the client for approval.

The design manager coordinates the process of assessing and recommending the tenders submitted.

The design manager provides consultancy to the client in respect of the scope and nature of construction management and technical supervision.

The design manager coordinates follow-up by the consultants, including in relation to joint design and supplier and contractor design.

#### **2.1.2 Programming**

The design manager draws up a design programme in cooperation with the consultants, is responsible for any revisions, and ensures that the design programme is followed.

The design manager draws up a tender programme in cooperation with the consultants.

#### **2.1.3 Cost management**

The design manager monitors the costs of the project, including obtaining cost estimates from the individual project consultants for the preparation of a budget defined on the basis of budget items established by the client.

This budget is updated at every design stage.

Following receipt of tenders, the design manager updates the budget and prepares an overall recommendation to the client that compares the most recently approved budget with the tender results. This recommendation is drawn up on the basis of contributions from the individual consultants.

#### **2.1.4 Authorities**

The design manager handles any advance dialogue, ensures that the consultants submit applications to the authorities and coordinates other negotiations with miscellaneous authorities for the purpose of obtaining planning

permission and other necessary permits, and finally clarifies the conditions of such permission and permits.

The design manager coordinates the collaboration between the consultants with a view to meeting the requirements of the building regulations towards energy needs and indoor climate.

The design manager coordinates the collaboration between the consultants with respect to the establishment and implementation of a fire strategy, with a view to obtaining regulatory approval.

#### **2.1.5 Quality assurance**

If the client has delegated the responsibility for drawing up a QA plan to the design manager, this party will be responsible for drawing up such a plan in cooperation with the other consultants. The quality plan defines the scope of, and programme for, review and control procedures, including review and control by the suppliers and contractors of any supplier or contractor design.

The design manager coordinates interdisciplinary project reviews during the project proposal and main project stages, including in relation to any supplier or contractor design.

The design manager coordinates the compilation of supervision plans by the consultants.

#### **2.1.6 Client**

The client grants the design manager appropriate authorisation, etc.

The client approves the type of tendering procedure and the allocation of contracts.

Unless otherwise agreed, the client undertakes working environment coordination in the design stage and develops the framework for the health and safety plan and log.

The client reviews the draft tender conditions drawn up by the consultants, including the conditions for tendering, construction project description, construction contracts, etc., for compliance with contract law.

The client approves the updated budgets.

The client approves the recommended tenders and enters into construction contracts.

The client prepares and updates the budget and other costs.

The client takes out insurance as needed.

The client hands over an accessible digital basis to the consultants in the agreed format and structure.

## **2.2 ICT MANAGEMENT**

In respect of agreed digital design work, the ICT manager is responsible for coordinating any digital cooperation between the consultants, designing suppliers and contractors, the client and authorities.

### **2.2.1 Contents**

The ICT manager must ensure that ICT specifications have been compiled for the agreed project documentation, covering, as a minimum, the following main areas:

- The purpose and scope of digital building models for each phase and each trade
- Management of digital communication
- Management of data security
- Management of the digital production of building models and drawings
- Management of digital tendering
- Delivery of digital data

The ICT manager participates in design meetings to the extent necessary in order to undertake ICT collaboration, and organises, manages and reports on other necessary meetings on ICT collaboration in the project.

### **2.2.2 Programming**

The ICT manager participates in drawing up a design programme, including timing of the exchange and provision of digital data.

### **2.2.3 Quality assurance**

The ICT manager coordinates collision and consistency control in the digital models for the various professional groups.

### **2.2.4 Client**

The client ensures that other consultants and parties involved in the project are obliged to undertake ICT collaboration to the extent deemed relevant.

### 3. Design phase consultancy

Design phase consultancy comprises the following services:

- 3.1 Outline proposal
- 3.2 Project proposal
- 3.3 Preliminary project (regulatory project)
- 3.4 Main project
- 3.5 Project follow-up

As stipulated in ABR 89, the outline proposal and the project proposal make up the proposal phase and may be implemented on an ongoing basis as one phase.

As stipulated in ABR 89, the preliminary project and the main project make up the design phase and may be implemented on an ongoing basis as one phase.

In the case of buildings subject to the Public Sector Construction Act and associated regulations on the use of ICT in construction, the consultant must comply with the requirements pursuant to sections 8.1, 8.2 and 8.4 - 8.7 in the description of services, as specified in the consultancy agreement and associated ICT specification.

In connection with the conclusion of a consultancy agreement, it is agreed whether and to what extent the project will be put up for tender on the basis of functional requirements.

The services to be provided by the consultant are coordinated with those of the other designers under the management of the design manager, and the consultant participates in design meetings in this connection.

The consultant must provide information on his/her area of responsibility as the basis for this coordination, including in relation to energy needs, indoor climate, fire prevention, etc.

The consultant shall perform his/her obligations as a designer in accordance with health and

safety legislation, and must within his/her own area of expertise contribute to the compilation of a health and safety plan and log.

#### 3.1 OUTLINE PROPOSAL

The outline proposal is a substantiated proposal for the completion of the project on the basis of an approved design specification.

##### 3.1.1 Contents

The outline proposal contains a description of the basis of the proposal, including its architectural concept, functions and sustainability, and proposals for the general choice of materials, design and installation principles as well as reflections on operation and maintenance.

##### 3.1.2 Project documentation

Depending on the nature of the project, e.g. the construction of new buildings or the extension/renovation of existing buildings, the following documents are prepared:

Architect:

- a description of the proposal, architectural concept, functions and sustainability, including architectural reflections on design and MEP principles
- proposals for the general choice of materials
- a site plan/layout plan showing the relative location of the buildings (scale: 1:500/ 1:1000)
- plan and elevation drawings (scale: 1:200/1:500)
- a report on floorage and plot ratios.

Landscape architect:

- a description of the proposal, including preliminary studies and analyses undertaken, a description of site area topography, accessibility, climate, plants and trees, soil and designation of utilisation of open spaces, if any
- proposals for the general choice of materials and vegetation
- plan drawings (scale 1:500/1:1000) giving an overall impression of the site.

Engineer – structures:

- a description and sketches of design principles and main systems

Engineer – plumbing, heating and ventilation systems:

- a description and sketches of the extent and design of systems, an assessment of capacities, main supply principles, technical plant rooms and wiring/piping systems.

Engineer – electrical works:

- a description and sketches of the extent and design of systems, an assessment of capacities, main supply principles, technical plant rooms and wiring/piping systems

In digital design, the scope of the digital building models must be determined in an ICT specification, such that coordinated building models and project documentation can be supplied in digital form.

Digital building models may be used to create visualisations of the architectural concept, functions, construction principles and main conduits, etc., corresponding to the project phase.

### 3.1.3 Programming

In cooperation with the design manager, the consultant assists in drawing up design, tender and construction programmes.

### 3.1.4 Cost management

The consultant provides the design manager with a cost estimate for the works in the consultant's scope.

This estimate will generally include the following main items:

- site acquisition
- demolition and clearing
- public utilities connection fees
- landscaping expenses
- construction costs
- MEP works costs
- fittings, fixtures and equipment
- environmental charges and other public taxes
- administration costs
- contingencies
- VAT.

The estimate must include building site costs and any measures undertaken in respect of winter conditions.

The estimate is generally prepared on the basis of estimated square metre and cubic metre prices. If the buildings consist of several units, such units are assessed separately.

The budget must contain information about pricing assumptions, the price index used and the price adjustments expected.

### 3.1.5 Authorities

The consultant compiles a calculated estimate of the building's energy requirements in accordance with Danish building regulations.

In cooperation with the design manager, the consultant establishes the building use category, the overall division into fire sections and assesses any need for active fire safety systems.

In cooperation with the design manager, the consultant submits matters to the relevant authorities and files general applications for exemption, if required.

The consultant participates in any negotiations with the authorities.

### 3.1.6 Quality assurance

The consultant undertakes a general review of the solutions included in the outline proposal.

### 3.1.7 Client

The client and/or user representatives appointed by this party participate during the process of drawing up the outline proposal in the required meetings on matters such as the detailed layout of rooms, equipment, etc.

The client prepares a budget for his/her other expenses such as special fit-out work, relocation expenses and financing.

The client approves the outline proposal as a basis for drawing up the project proposal.

## 3.2 PROJECT PROPOSAL

The project proposal is a revision of the approved outline proposal to such an extent that all decisions pivotal to the project have been made and included in the proposal.

### 3.2.1 Contents

The project proposal is the basis upon which the client makes his/her decisions on the aesthetic, functional, technical and financial solution of the project in question, principles of operation and maintenance as well as financing.

All investigations, including registration of existing conditions needed for the further design process, must be completed.

The project proposal must contain a proposal for the type of tendering procedure and the allocation of contracts.

### 3.2.2 Project documentation

Depending on the nature of the project, the following documents are prepared:

Architect:

- a description, including a description of the overall architectural approach and substantiated choice of structures and materials
- ground plan (scale 1:200/1:500)
- levels, sections and elevations (scale 1:100/1:200) and any detail sections on a larger scale
- basic furniture layout plans
- a report on floorage and a calculation of plot ratios.

Landscape architect:

- a description of the site's main characteristics and data
- a description of important parts and components
- plan drawings (scale 1:200/1:500) as well as sections describing the extent and nature of planned and existing sites seen in relation to buildings
- a description of surfaces, plants and trees, ground structures and equipment, and all main levels and material earthworks must also be specified
- an account of open spaces.

Engineer – structures:

- a description of main design principles, calculations of estimates, a description of the main structural system and governing load scenarios
- any noise and acoustic calculations with a view to complying with Danish building regulations
- structural plans and sections (scale 1:100/1:200) as well as typical components and critical details
- assessment of openings required for building services
- a report on ground works.

Engineer – plumbing, heating and ventilation systems:

- a description of the extent, design and main components of such systems
- layout plans indicating the location of building services (scale 1:100/1:200), schematic sections of building services and the main layout of technical plant rooms, as well as schematic diagrams
- schematic diagrams for wiring/piping systems, including important openings through structures.

Engineer – electrical works:

- a description of the extent, design and main components of electrical systems
- layout plans indicating the location of building services (scale 1:100/1:200), schematic sections of building services and the main layout of technical plant rooms
- schematic diagrams for wiring/piping systems, including important openings through structures.
- a description of lighting systems.

In digital design, the scope of the digital building models must be determined in an ICT specification, such that coordinated building models and project documentation can be supplied in digital form.

Digital building models may be used to communicate and coordinate the project's aesthetic, functional and technical solutions, etc., corresponding to the project phase.

### 3.2.3 Programming

In cooperation with the design manager, the consultant assists in updating design, tender and construction programmes.

### 3.2.4 Cost management

On the basis of its own responsibilities, the consultant submits a budget to the design manager.

The budget is prepared as a summary budget or as a specialist budget on the basis of the project proposal.

In a standard building project, the budget is divided into the following main items:

- site acquisition
- demolition and clearing

- landscaping expenses
- public utilities connection fees
- building basis
- primary building components
- complementary components
- surface finishes
- plumbing, heating and ventilation systems
- electrical installations
- fittings, fixtures and equipment
- artistic decoration
- building site costs and measures taken in respect of weather conditions
- environmental charges and other public taxes
- administration and costs, possibly broken down into consultant fees, including construction management and technical supervision, reproduction, other costs and client administration
- contingencies
- VAT.

This budget is an overall budget to be maintained by the consultant and is the economic basis on which the client makes its decisions.

The budget must contain information on:

- the price index used and agreements on any price adjustments
- the intended type of tendering procedure
- other conditions and any reservations in respect of the budget and its items, such as employment and market conditions, as well as other matters essential to the preparation of the budget.

### 3.2.5 Authorities

The consultant provides the design manager with relevant material to obtain the required acceptances or basic approvals from the authorities.

The calculated estimate of energy requirements in accordance with Danish building regulations must be updated, and the fire safety documentation may be further detailed.

The consultant participates in any negotiations with the authorities.

### 3.2.6 Quality assurance

The consultant reviews the project proposal, to ensure that:

- the project proposal is consistent with the particulars of the outline proposal

- the requirements contained in the design specification for the general quality (form, function, technology) of the buildings and for construction costs and programming have been met, and
- the project proposal can form the basis for preparing a preliminary project and a main project.

The consultant notifies the client of any special or hazardous findings ascertained in the review.

The consultant participates in interdisciplinary project reviews.

### 3.2.7 Client

The client and/or user representatives appointed by this party participate during the process of drawing up the outline proposal in the required meetings on matters such as the detailed layout of rooms, equipment, etc.

The client approves the overall budget and updates its budget for other expenses.

The client approves the project proposal as a basis for the further design process.

## 3.3 PRELIMINARY PROJECT (REGULATORY PROJECT)

The preliminary project (regulatory project) is a revision of the approved project proposal to such an extent that it can form the basis for approval by the authorities.

The preliminary project (regulatory project) forms an integral part of the main project.

### 3.3.1 Contents

The preliminary project (regulatory project) contains a statement describing the final design of the project in relation to regulatory requirements, including a description of the project's architecture, choice of design, choice of materials and MEP systems.

### 3.3.2 Project documentation

The architect prepares, possibly in cooperation with the landscape architect, a statement describing zoning, adjacent buildings as well as access and parking conditions for the project.

The engineer provides acoustic calculations, if required, and prepares documentation for the purpose of meeting the requirements contained



in Danish building regulations for energy requirements.

The main drawings must comply with regulatory requirements for documenting legislative matters and describe the design, structures and technical installation principles.

In digital design, the scope of the digital building models must be determined in an ICT specification, such that coordinated building models and project documentation can be supplied in digital form.

Digital building models can form the basis for the communication and coordination of the regulatory project, including site areas, fire safety, etc. in relation to the client and public authorities, corresponding to the project phase.

### 3.3.3 Programming

In cooperation with the design manager, the consultant assists in updating design, tender and construction programmes.

### 3.3.4 Cost management

In cooperation with the design manager, the consultant assists in updating the overall budget of the project proposal in accordance with the general trend in prices and any agreed project changes.

### 3.3.5 Authorities

The fire safety system documentation must be detailed and any calculations and fire plans prepared.

The consultant submits relevant information to the authorities and notifies the design manager accordingly.

The consultant participates in any negotiations with the authorities.

### 3.3.6 Quality assurance

The consultant reviews the preliminary project prepared (regulatory project) to ensure that:

- the preliminary project (regulatory project) is consistent with the particulars of the project proposal
- official requirements with respect to the building design, function and construction method have been met
- the preliminary project (regulatory project) can form the basis for preparing the main project and the remainder of the tender conditions.

### 3.3.7 Client

The client approves the preliminary project (regulatory project).

The client updates his/her budget for other expenses.

The client approves any applications for exemption in respect of regulatory matters.

## 3.4 MAIN PROJECT

The main project describes the project precisely and with such a level of detail that it can form the basis for final clarification of the conditions contained in the planning permission as well as for tendering, contracting and construction.

### 3.4.1 Contents

The main project must include a list of documents, a description of the building project, work specifications, drawings, a programme and schedules of rates.

In the tender documents, the consultant specifies the extent of any design work to be performed by the consultant after contracting, possibly in the form of joint design.

The consultant stipulates the requirements towards supplemental supplier and contractor design, and documentation of this.

In digital design, the ICT specification is included as the basis for supplier and contractor design.

In the tender documents, the consultant stipulates the extent of the consultant's review and possible supervision of the supplier and contractor design.

The consultant draws up a tender Quality Control plan.

The main project must list the requirements towards the operation and maintenance instructions, etc., to be handed over by the contractors.

In cooperation with the design manager, the consultant assists in drawing up a draft of the Project Description.

In cooperation with the other consultants involved in the project, the lead consultant assists in handling the process of inviting tenders, assessing tenders submitted, handling technical and financial clarification as well as making recommendations for tenders submitted.

### 3.4.2 Project documentation

Depending on the nature of the project, the following documents are prepared as a basis for inviting tenders:

Architect:

- work specifications and schedules of rates
- drawings comprising general drawings, layout drawings, building component drawings and detailed drawings
- updates of floorage and plot ratio calculations.

Landscape architect:

- work specifications and schedules of rates
- drawings comprising general drawings, layout drawings and detailed drawings
- updates of open space calculations in relation to approval by the authorities.

Engineer – structures:

- work specifications and schedules of rates
- drawings comprising general drawings, layout drawings, building component drawings and detailed drawings
- reviews of other consultants' load requirements that affect structural capacities
- updates of acoustic calculations, if any, as stipulated in the requirements of the Danish building regulations
- static calculations.

Engineer – plumbing, heating and ventilation systems:

- work specifications and schedules of rates
- drawings comprising general drawings, layout drawings, building component drawings, diagrams and detailed drawings
- a report on openings through structures and their setting out
- updating of documentation for compliance with the requirements of the Danish building regulations with respect to energy requirements.

Engineer – electrical installations:

- work specifications and schedules of rates

- drawings comprising general drawings, layout drawings, building component drawings, diagrams and detailed drawings
- drawings of electrical distribution panels, including power circuits
- a report on openings through structures and their setting out

In digital design, the scope of the digital building models must be determined in an ICT specification, such that coordinated building models and project documentation can be supplied in digital form.

Digital building models can form the basis for the communication and coordination of the main project, including architectural, structural and MEP solutions, etc., in relation to the client and the bidding suppliers and contractors, corresponding to the project phase.

### 3.4.3 Programming

In cooperation with the design manager, the consultant assists in preparing the tender document programme for the completion of the project, including a statement of the start and end dates of the individual contracts, as well as any milestones which bear penalties in the event of delay.

### 3.4.4 Cost management

The overall budget of the project proposal is updated in accordance with the underlying trend in market prices and any agreed project changes. The budget is submitted to the design manager.

The budget is sub-divided based on the division of contracts.

Following receipt of tenders, the consultant assists the design manager in updating the overall budget.

If the total updated budget – after the receipt of tenders – appears to exceed the agreed variances in relation to the approved budget, the client may require that the project be revised in cooperation with the consultant on the basis of detailed terms and conditions to be agreed upon.

If the overrun of the approved budget is the result of:

- an agreed price adjustment

- changes in the project as agreed with the client
  - changes in the specified budget assumptions
  - conditions of which the consultant was not or could not have been aware at the time when the budget was updated,
- then a project revision is made, if required, with full payment to the consultant.

If an agreement to redesign the project involves the assistance of another consultant and so results in redesign expenses on the part of that consultant, the client will be under an obligation to pay such expenses directly to the consultant in question, possibly with recourse against the consultant being responsible for the budget overrun.

If the design work is performed on a cost reimbursement basis, the relevant agreement must specify the payment of costs incurred in connection with any such redesign work.

#### **3.4.5 Authorities**

The consultant updates the fire safety documentation.

The consultant submits any supplementary material to the authorities and notifies the design manager accordingly.

The consultant participates in any negotiations with the authorities.

#### **3.4.6 Quality assurance**

The consultant performs internal reviews and checks by systematically going over the main project and the tender documents for the purpose of ensuring that:

- the main project is consistent with the particulars of the project proposal, and
- the individual items of the project material are consistent with one another.

The consultant participates in interdisciplinary project reviews.

The consultant draws up a supervision plan.

#### **3.4.7 Client**

On the basis of the consultant's recommendation, the client approves the main project as a basis for inviting tenders.

The client reviews the draft tender documents, construction contracts, etc., drawn up by the consultant for compliance with contract law.

If required, the client participates in a revision of the project as stipulated in 3.4.4 above.

The client takes out insurance as needed.

### **3.5 PROJECT FOLLOW-UP**

These services are design services related to project work performed by the consultant.

The purpose of project follow-up is to help ensure that work performed, including any additional design performed by suppliers and contractors, is consistent with the intentions of the project.

For information about performance control, see 4.2, Technical Supervision.

#### **3.5.1 Contents**

The services are provided during the construction phase and comprise services in continuation of the preceding design phases in the form of required project clarifications.

The services cover additional design as described in the consultant's tender conditions, to the extent that design can most appropriately take place - after entering into the contract - based on the suppliers' and contractor's design or choice of materials, possibly in the form of joint design.

The consultant reviews any additional project documentation prepared by suppliers and contractors to ensure that the project is consistent with the requirements and intentions of the tender documents, including interfaces with other contracts.

The consultant holds project review meetings with suppliers and contractors to the extent agreed upon, and prepares minutes from such meetings.

The consultant participates in project review meetings with suppliers and contractors to the extent agreed upon.

At project follow-up, efforts must be made to ensure that relevant project documentation is

handed over to the construction manager and the site supervisor.

The consultant furthermore assists the site supervisor in approving and assessing working drawings, working calculations, material samples, colours, structures and building services within its technical field.

### **3.5.2 Project documentation**

The consultant collects updated project documents, including any digital building models, produced by suppliers and contractors in accordance with the consultant's requirements contained within the contracts with the individual suppliers and contractors.

The consultant updates its project on the basis of the consultant's project clarifications and any additional design performed by the consultant. The update is performed to an extent that permits regulatory approval and an occupancy permit within the consultant's area of responsibility.

In digital design, the scope of the digital building models must be determined in an ICT specification, such that coordinated building models and project documentation can be supplied in digital form.

Digital building models may be utilised to produce visualisations for suppliers and contractors during the building project, corresponding to the project phase.

### **3.5.3 Programming**

The site supervisor is assisted in assessing the consequences of any project specifications and any additional design in terms of time.

### **3.5.4 Cost management**

The site supervisor is assisted in inviting tenders and assessing tenders in connection with project specifications and any additional design.

### **3.5.5 Authorities**

The consultant provides the design manager with the updated regulatory project (see 3.5.2).

### **3.5.6 Quality assurance**

The consultant regularly reviews and checks his/her own project specifications and own additional design for the purpose of ensuring

that the project continues to be consistent with the particulars of the main project.

### **3.5.7 Client**

On the basis of the consultant's recommendation, the client approves any additional design performed by the consultants or by suppliers and contractors as the basis for construction.

## 4. Construction phase consultancy

Construction phase consultancy comprises the following services:

4.1 Construction management

4.2 Technical supervision

In the case of buildings subject to the Public Sector Construction Act and associated regulations on the use of ICT in construction, the consultant must comply with the requirements pursuant to sections 8.1, 8.2 and 8.4 - 8.7 in the description of services, as specified in the consultancy agreement and associated ICT specification.

### 4.1 CONSTRUCTION MANAGEMENT

A construction manager is appointed before the building process commences. The construction manager monitors the overall progress of the building project in terms of programming, quality and costs and manages relevant documentation. The construction manager is also responsible for coordinating general building site activities.

The scope of construction management is defined in an agreement between the client and the construction manager.

The construction manager draws up a construction management plan.

#### 4.1.1 Contents

The construction manager represents the client in matters involving the contractors in respect of organisation and performance of work and has powers and obligations as stipulated in article 17 of AB 92 ("General Conditions for the Provision of Works and Supplies within Building and Engineering").

The construction manager assists the design manager in drawing up a building site plan.

The construction manager assists the working environment coordinator in the preparation and updating of the health and safety plan.

The construction manager ensures that working environment coordination takes place during construction.

The construction manager is responsible for drawing up administrative rules on the overall site supervisory function and monitors compliance with such rules.

The construction manager coordinates overall technical supervision.

The construction manager convenes and presides at building meetings and prepares minutes from such meetings.

The construction manager presents problems encountered and any proposals for project changes during the construction phase to the design manager with whom he/she agrees how to address such problems or changes.

The construction manager reports to the client on the progress of the construction project in terms of programming and costs and makes arrangements for the client's approval of payment and/or change requests during the project.

The construction manager coordinates activities to obtain operation and maintenance instructions drawn up by suppliers and contractors and hands over such documentation to the client.

The construction manager organises and manages the handing-over meeting with the assistance of the site supervisor.

The construction manager organises and manages the 1-year inspection with the assistance of the site supervisor and assesses whether performance bonds can be reduced.

#### 4.1.2 Programming

The construction manager assists the design manager in drawing up a tender programme.

The construction manager monitors the overall progress of the building project in terms of

programming and manages relevant documentation.

The construction manager draws up and updates programmes in cooperation with the site supervisor and the contractors on the basis of the tender programme.

The construction manager registers the progress of work on the basis of information provided by the site supervisor and records weather conditions and any delays due to bad weather.

The construction manager reports to the client and the designers' consultants on the progress of the building project in terms of programming and arranges, in cooperation with the site supervisor, for the consequences in terms of time resulting from changes made during the course of the building project to be agreed with the parties involved.

#### **4.1.3 Cost management**

The construction manager obtains performance bonds from the contractors.

During the construction phase, the construction manager monitors the overall progress of the building project in terms of costs and manages relevant documentation.

The construction manager keeps building accounts, approves on-account bills and invoices and draws up the final building accounts.

In cooperation with the site supervisor, the construction manager considers claims made by the contractors.

The construction manager reports to the client and the design team on the progress of the building project in terms of costs and, in cooperation with the site supervisor, arranges for additional payments made during the course of the building project to be approved by the client.

#### **4.1.4 Authorities**

The construction manager handles relations with authorities in respect of building site functions.

The construction manager is responsible for submitting statements of completion and for obtaining an occupancy permit.

#### **4.1.5 Quality assurance**

The construction manager checks that the client has delegated competence and responsibility liability, and has established ways of communication.

The construction manager makes plans and ensures that a QA plan is available from the contractors and that project review meetings are held.

#### **4.1.6 Client**

Before construction phase consultancy is provided, an organisational chart must be drawn up, listing the competences and responsibilities of the person or persons duly authorised.

The client manages project review meetings, but may delegate such responsibility to the construction manager.

The client assesses and approves any alterations in writing or authorises the construction manager to perform such tasks.

The client pays payment requests presented by the construction manager.

Unless otherwise agreed, the client undertakes working environment coordination during the construction phase.

The client transfers the log to the operations manager.

The client appoints an independent energy consultant to prepare an energy certification report and submits it to the building authorities before statement of completion.

The client participates in the handing-over meeting and signs the handing-over documents.

The client convenes the 1-year inspection process.

## **4.2 SITE SUPERVISION**

The site supervisor is responsible for quantitative and qualitative control procedures

in the form of inspections performed on a spot check basis. The scope of such procedures is laid down in an agreement between the client and the consultant.

The site supervisor draws up a plan for technical supervision.

#### **4.2.1 Contents**

On the basis of the site supervision plan, the site supervisor performs on-site checks to ensure that work is performed in accordance with the project and as stipulated in the construction contracts.

The site supervisor requests any necessary project specifications from the party responsible for project follow-up and notifies the construction manager of any consequences in terms of programming and costs.

The site supervisor ensures that revised drawings and any digital building models are handed over to the contractors.

The site supervisor provides the construction manager with information needed to perform his/her coordinating and administrative functions.

The site supervisor participates in building meetings to the extent agreed upon.

The site supervisor draws up defects lists for the hand-over meeting and checks that defects are remedied.

Operation and maintenance instructions, etc., listed as required in the contract documents are obtained from the contractors and handed over to the construction manager.

The site supervisor draws up punch lists for the 1-year inspection and checks that defects are remedied.

#### **4.2.2 Documentation**

The site supervisor prepares supervision notes and reports on building site staffing and equipment, work performed, etc., in respect of own contracts.

#### **4.2.3 Programming**

The site supervisor assists the construction manager in drawing up and updating construction programmes.

The site supervisor prepares progress reports.

#### **4.2.4 Cost management**

The site supervisor reviews invoices issued, including the final accounts.

The site supervisor assists in managing the budget in connection with any changes in the scope of contracts, measures taken in respect of winter conditions, additional foundation work, etc.

The site supervisor verifies works provided on a quantities basis.

#### **4.2.5 Authorities**

The site supervisor performs spot checks to verify that the contractors have arranged for the required inspections by the authorities to be made and that the conditions stipulated by the authorities for the performance of the work are met. The site supervisor also provides the construction manager with information for the completion notice to be submitted to the authorities.

#### **4.2.6 Quality assurance**

The site supervisor checks that the quality inspection plans of the contractors comply with the requirements of the contract documents.

The site supervisor participates in project review meetings.

The site supervisor performs checks as specified in the supervision plan.

#### **4.2.7 Client**

The client approves material samples and construction tests as stipulated in the contract.

## 5. Operational phase consultancy

The consultant may assist in performing tasks related to occupancy and property operation (buildings and facilities).

The operation and maintenance plan may also cover the concept of a “care plan” for landscape architect services.

The services to be provided by the consultant and the scope of such services may be agreed separately for each service to be provided:

- 5.1 Preparation of an operation and maintenance plan
- 5.2 Implementation of the operation and maintenance plan
- 5.3 Assistance with property operation

### 5.1 PREPARATION OF AN OPERATION AND MAINTENANCE PLAN

The operation and maintenance plan is drawn up for the purpose of optimising and systematising the operation of buildings and building components.

The operation and maintenance plan describes operational activities and inspection routines required to make the property operate adequately when it has been handed over to the client, including activities to be performed for the client to keep 1-year and 5-year guarantees valid.

The operation and maintenance plan must contain relevant information about the operation and maintenance of the property in question.

Unless otherwise agreed, the operation and maintenance plan must include sections on:

- required operational and maintenance activities, including operational and maintenance routines
- completion dates for maintenance work on conditions specifying the required state of maintenance for the buildings and listing

- estimated dates for the replacement of building components and installations
- the financial resources required to comply with the plan
- Occupational health and safety

For landscape architect work, a “care plan” may be prepared for the purpose of describing routine work to be performed throughout the year as well as the expected development of facility vegetation over a number of years and fixing any special work to be performed in this respect. The care plan specifies the level of quality and maintenance activities for various landscape facilities and individual components, if need be.

The operation of the property shall document that the care plan has been implemented systematically.

The scope and system of documentation must be determined in accordance with the client's needs.

### 5.2 IMPLEMENTATION OF THE OPERATION AND MAINTENANCE PLAN

The client is responsible for implementing the operation and maintenance plan.

At the request of the client, the consultant may assist in implementing the operation and maintenance plan drawn up.

An agreement may be concluded to provide assistance in setting up an operational organisation for the property in question.

### 5.3 ASSISTANCE WITH PROPERTY OPERATION

The client is responsible for the operation of the property. At the request of the client, the consultant may provide assistance in connection with such operation. The purpose of providing assistance is to ensure that the intentions of the operation and maintenance plan are met, that the operation and maintenance plan is updated and that buildings and grounds are maintained in a technically correct manner.

The extent of assistance must be defined for the individual property with reference to the operation and maintenance plan and may comprise:



- maintenance routines, such as performing inspections and preparing structural surveys as well as monitoring and managing preventive and corrective maintenance work; preparation of maintenance budgets for specified periods
- assistance in drawing up tender documents, implementing calls for tenders, assessing tenders and managing the performance of maintenance work
- | • systematisation of experience gained by the operational organisation
- clarification of questions from the operational organisation and advice in connection with questions relating to the operation of the property
- quality assurance of the operation of the property by checking that the instructions specified in the operation and maintenance plan are followed
- proposals for concluding/terminating service and insurance agreements
- proposals for and management of the process of revising the operation and maintenance plan
- Occupational health and safety.

For landscape architect work, the consultant may supervise that the intentions of the care plan are followed and that the prescribed routines and work are performed correctly. The consultant can monitor the development of the facility and, in consultation with the client, makes any adjustments to the care plan.

The assistance should be provided through regular inspections, recorded as inspection notes, which make up the log book for the landscape facility.

To the extent agreed upon, the consultant checks that routines are implemented as planned and that the operation and maintenance plan is followed.

## 6. Fittings, fixtures and equipment consultancy

The consultant may, as agreed between the parties, assist in purchasing standard fittings, fixtures and equipment (fixed/non-fixed) and in adjusting such fittings, fixtures and equipment to functions and MEP services.

The consultant may, as agreed between the parties, also provide assistance in connection with the design, etc., of special fittings, fixtures and equipment.

### 6.1 STANDARD FITTINGS, FIXTURES AND EQUIPMENT

In cooperation with the client, the consultant lays down requirements for standard fittings, fixtures and equipment (fixed/non-fixed) and establishes the extent and nature of such fittings, fixtures and equipment. Cost estimates are prepared in respect of deliverables and are approved by the client.

Depending on the nature and scope of the project, furniture plans may be drawn up according to an agreement.

#### 6.1.1 Purchasing

Quantities to be purchased are described and terms of delivery are drawn up on the basis of the client's information, and a programme is prepared for deliverables.

#### 6.1.2 Calls for tender

If receipt of tenders is considered an advantage, the above material must be supplemented with special rules on the process of inviting tenders.

Following receipt of tenders, a financial statement and a recommendation for supply are prepared for final approval by the client.

#### 6.1.3 Client

The client approves estimates. The client draws up special tender conditions and approves

tender documents, invites and approves tenders and signs agreements with suppliers.

### 6.2 DESIGN OF FITTINGS, FIXTURES AND EQUIPMENT

In cooperation with the client, the consultant lays down requirements for special fittings, fixtures and equipment and establishes the extent and nature of such fittings, fixtures and equipment.

Depending on the nature of the project, a programme may, as agreed between the parties, be drawn up to form the basis for the client's decisions, invitation of tenders, agreement and construction.

#### 6.2.1 Contents

Tender documents are drawn up for inviting tenders, including schedules of rates.

#### 6.2.2 Project documentation

Furniture plans, descriptions, bills of quantities for individual rooms as well as detailed production drawings, diagrams, etc., are drawn up, if required.

In digital design, the scope of the digital building models must be determined in an ICT specification, such that coordinated building models and project documentation can be supplied in digital form.

Digital building models may be used to visualise interiors, etc., for the client, users and suppliers.

#### 6.2.3 Programming

Programmes are drawn up for the design, tender, construction, delivery and installation processes.

#### 6.2.4 Cost management

Estimates are prepared for the individual components of the contract.

The consultant assists in inviting tenders, assesses tenders submitted and makes a recommendation to the client on this basis.

#### 6.2.5 Authorities

The consultant obtains approval from the authorities if the nature of the project requires such approval.

### **6.2.6 Client**

The client approves estimates. The client draws up special tender conditions and approves tender documents, invites and approves tenders and signs agreements with the contractors.

## 7. Planning consultancy

The consultant may, as agreed between the parties, provide assistance in connection with general plans for building and civil engineering projects. Such assistance may typically be provided in connection with urban development, changes in the existing urban layout as well as landscape planning and adaptation of transport structures.

These plans often form the basis for subsequent building and engineering work.

The various types of planning are listed in 7.1, whereas consultancy stages and services in connection with planning are specified in 7.2-7.9.

### 7.1 PLANNING TASKS

Planning tasks comprise the following:

7.1.1 Summary plans

7.1.2 Sector plans

7.1.3 EIA

7.1.4 Other tasks

#### 7.1.1 Summary plans

- landscape planning contributions
- regional plans
- local authority plans
- urban policy and strategic planning
- zoning plans
- area and layout plans
- urban district and centre plans
- general urban renewal
- holiday and recreational areas
- open landscape, etc.
- accessible routes
- sustainable development.

Such summary plans are often physical plans covering all matters within a geographically defined area.

#### 7.1.2 Sector plans

- population trends

- improvement of private and public services
- industrial development (local and regional)
- utilities, e.g. electricity, water, heating, etc.
- waste treatment
- nature protection
- areas of cultural heritage interest
- tourism development
- extraction of raw materials
- environmental protection
- traffic planning
- urban renewal, etc.

Sector plans often take the form of action plans and so in many cases form the basis for physical planning.

#### 7.1.3 EIA (Environmental Impact Assessment)

- large-scale building complexes
- large-scale infrastructural facilities
- large-scale technical facilities

An EIA is made on the basis of a specific, large project and is an assessment of the environmental impacts of the project in general terms.

EIAs take the form of regional plan supplements.

#### 7.1.4 Other tasks

- analyses, for example in connection with location and market conditions
- links between physical, economic, social and cultural planning
- contributions in the form of assumptions for, and preparation of, forecasts and similar projections for the future
- organisation of and participation in public hearing procedures, including organisation and arrangement of competitions
- organisation of and participation in conferences and seminars
- preparation of publications, exhibition material, etc.
- logistics, for example in connection with design and construction of large transport structures
- preparation of programmes and investment plans
- preparation of action plans
- development work, for example in connection with legislative preparation and drafting of guidelines.

Such tasks are usually based on needs established in connection with work performed under 7.1.1-7.1.3, above.

### **7.2 BRIEF AND WORK PROGRAMME**

In cooperation with the client, the consultant prepares a brief as well as a work programme as the basis for an agreement on the services to be provided.

Focus must be on matters that need to be clarified in the agreement between the parties.

Such clarification must form the basis for regularly assessing whether the nature or scope of tasks to be performed changes during the process and if so, whether the agreement needs to be amended.

A scope brief and the resulting work programme must typically specify the following details:

- the purpose of the work
- a description of how the task will be performed
- a programme and a work schedule
- information about any necessary backgroundmaterial, such as relevant data and maps. • a specification of services to be provided by the client and the consultant, respectively
- form of presentation and communication
- the extent to which meetings are included in the agreement (and a list specifying such meetings, if required)
- a handing-over agreement, for example public presentation, final approval by local councils, etc.
- a list of employees likely to work on the project in question and a list of persons responsible to the client, if required.

### **7.3 PREPARATORY WORK**

Physical planning is often based on existing conditions. This may generate a need for certain preparatory work, such as:

- viewing
- surveys and measurements
- provision of updated data and map material
- collecting and processing new data
- interviews, etc., with representatives and reference groups, if required.

### **7.4 PROBLEM DESCRIPTION**

An analysis and an assessment of the existing situation and thus an identification of problems

are made on the basis of the documentation obtained. Such work may take into account both qualitative and quantitative aspects. One purpose of the problem description is to establish the interdependence of the various factors relevant to the project in question.

### **7.5 FORECASTS**

As a basis for planning work, forecasts may need to be prepared in cooperation with the client. Such forecasts may be projections based on figures or merely assumptions of future conditions.

### **7.6 OBJECTIVES**

On the basis of elements such as forecasts, one or more draft objectives are formulated – usually in cooperation with the client – for the problems to be addressed in the plan.

### **7.7 ALTERNATIVE PLANS**

It may often be expedient or even necessary to provide alternative proposals to perform the tasks in question. In this case, such arrangements must be agreed with the client. Alternatives must be prepared for EIAs.

### **7.8 IMPACT ASSESSMENT**

To assist the client in choosing between alternative proposals, descriptions of impacts may be drawn up for each alternative proposal. The impacts of alternatives must be described for EIAs.

### **7.9 PUBLIC COMMENT PROCEDURES**

The consultant may assist in completing a public hearing phase, if needed.

Such work may comprise preparation of discussion papers, exhibition material, organisation of and participation in public meetings and study groups, preparation of leaflets, etc.

## 8. Other services

The consultant may, if agreed with the client, provide the following services or, on behalf of the client, arrange for such services to be provided by other parties.

The scope of these services included must be specified in the agreement.

### ICT in construction

#### 8.1 CLASSIFICATION

Classification of digital project information through the use of a common classification system. In classification, the system, purpose and scope of the classification must be defined in an ICT specification and any relevant IDMs.

#### 8.2 DIGITAL COMMUNICATION

The service may involve the use of a common digital communication platform for the sharing and exchange of project documentation that is common to several project partners.

Examples of suitable systems include project web, BIM server, Internet websites, tele- or video conferencing systems and social media.

The service must be defined in an ICT specification.

#### 8.3 ESTABLISHMENT OF COMMUNICATIONS PLATFORM

The service may involve the establishment and operation of a common digital communications platform.

The service must be defined in an ICT specification.

#### 8.4 DIGITAL DESIGN

The service comprises the construction of one or more digital 3D building models (BIM) as the basis for coordinated design, analysis and project documentation.

To the extent that the building models form the basis for project documentation, the models must be supplied together with the project documentation at the client's request.

The exchange and delivery of building models must be defined in an ICT specification and any associated IDMs.

#### 8.5 DIGITAL TENDERING

The service comprises digital management of the tendering phase, including preparation of structured digital tender documents, selection and management of tendering portal and assessment of the digital quality of digital tenders received.

The service must be defined in an ICT specification.

#### 8.6 BILL OF QUANTITIES

The service comprises the preparation of schedules of rates with quantities, and a description of the methods of measurement applied.

The service must be defined in an ICT specification.

#### 8.7 DIGITAL DELIVERY

The service comprises the provision of digital project material or digital "as built" material on the basis of specific client requirements.

The service must be defined in an ICT specification and any relevant IDMs.

### Other services

#### 8.8 ASSESSMENT OF BUILDING SITES

Overall assessment of possible building sites for the client's planned building project. A report is drawn up, which may contain an evaluation of:

- price of land/property
- zoning
- infrastructure
- possible uses
- ground conditions and accessibility
- soil conditions and environmental aspects
- supplies.

#### 8.9 REGISTRATION OF EXISTING CONDITIONS

Registration of existing conditions may include:

- an assessment of the property's condition as documentation for the property owner and the authorities
- an assessment of the property's possibility of fulfilling accessibility requirements
- inspection, measurement and drawing or digitalisation of existing open spaces, facilities and buildings
- photo registration
- registration of fixtures and fittings
- historical investigations and research in archives

The registration comprises only what is relevant to the current refurbishment or rebuilding project.

The registration is updated if the further design process or the physical performance of work alters the present conditions.

#### **8.10 DIGITALISATION OF EXISTING CONDITIONS**

The service encompasses the digitalisation of existing buildings and facilities in building models or drawings, to the extent agreed.

#### **8.11 GEOTECHNICAL INVESTIGATIONS**

Initial geotechnical assessments based on available existing investigations in the area in question, supplemented by individual geotechnical drilling and water table monitoring, if required.

Development of a programme for geotechnical investigations as a basis for design work, including estimates of such investigations.

Completion of geotechnical investigations comprising field work, laboratory tests, geological evaluation and classification, reporting, including drilling profiles as well as determination of strength parameters and design water levels.

Follow-up during the construction phase.

#### **8.12 ENVIRONMENTAL INVESTIGATIONS**

Collection of basic information about the building site and compilation of history, including assessment of the likelihood of pollution and contamination and the nature of such pollution and contamination.

Development of a programme for environmental investigations, including estimates of such investigations.

Completion of environmental investigations, analysis of samples and processing of test results. Reporting on investigations, including assessment of the extent and nature of pollution and contamination, proposals for preventive measures and estimates of the costs of such remediation.

Follow-up during the construction phase.

Negotiation with authorities.

#### **8.13 OFFICIAL DUTIES**

Preparation of material for and participation in official duties such as inspection and expropriation, including preparation for and negotiations with authorities.

#### **8.14 RISK ANALYSES**

Analysis and management of specific conditions subject to risk.

#### **8.15 COST ANALYSES**

Calculations of the cost consequences of alternative scenarios, preparation of operating budgets, preparation of investment plans and profitability calculations.

Preparation of special estimates, including successive calculations, etc., specified and implemented according to the client's special requirements.

Overall financial assessments or overall financial calculations comprising the capitalisation of total construction and operating costs during the lifetime of the relevant buildings.

#### **8.16 INSURANCE**

Advice on types of insurance in connection with the design, construction and operation of the buildings, including the invitation of quotations, if required, through an insurance broker.

#### **8.17 PROCESS MANAGEMENT/CONSULTANCY**

Organisation of user involvement, including arranging special user seminars, etc.

Team building, including arrangement of workshops, start-up seminars, etc., in

connection with the planning and completion of the building project.

Implementation of final evaluations.

#### **8.18 SPECIAL VISUALISATION**

This service comprises the production of physical or digital models, architectural photos, photorealistic visualisation, 3D visualisation, animations, real-time visualisation and interactive presentations.

#### **8.19 MEASUREMENT OF WORK PERFORMED**

The service involves the measurement of work performed. The scope and level of detail of the measurement must be agreed between the parties.

#### **8.20 "AS BUILT"**

'As built' services are provided to bring the project documentation to a level at which these documents and the currently completed project are consistent with one another to a specified extent, beyond that required within the consultant's area of responsibility to obtain regulatory approval and an occupancy permit .

The level of such consistency may be agreed for the current project in accordance with PAR's and FRI's description of services for "Som udført", 2000.

#### **8.21 COMPLIANCE WITH SPECIAL REGULATORY REQUIREMENTS**

Assistance to ensure compliance with requirements in addition to existing requirements contained in legislation, provisions, etc., governing the buildings in question.

Documentation of structural calculations in addition to the provisions of Danish building regulations made by a certified structural engineer and documentation prepared by an independent certified structural engineer.

Assistance to ensure compliance with requirements contained in legislation, provisions, etc., taking effect after the conclusion of the consultancy agreement.

#### **8.22 FIRE SAFETY**

Assistance in connection with the provision of function-based, fire safety calculations, fire strategy plans, escape route and site allocation plans and operation, inspection and

maintenance plans, in addition to the requirements specified in the design specification and Danish building regulations.

#### **8.23 ENERGY REQUIREMENTS**

The provision of energy calculations or simulations, in addition to requirements specified in the design specification and Danish building regulations.

Commissioning of an energy certification report to be prepared by an independent energy consultant.

#### **8.24 THERMAL INDOOR CLIMATE**

Calculations or simulations of thermal indoor climate in addition to the requirements contained in Danish building regulations.

#### **8.25 ATMOSPHERIC INDOOR CLIMATE**

Calculations or simulations of atmospheric indoor climate in addition to the requirements contained in Danish building regulations.

#### **8.26 NOISE AND ACOUSTIC INDOOR CLIMATE**

Calculations and measurements or simulations of noise and acoustics in addition to the requirements contained in Danish building regulations, including:

- sound measurements
- acoustic calculations.

#### **8.27 OPTICAL INDOOR CLIMATE**

Calculations and measurements or simulations of optical indoor climate in addition to the requirements contained in Danish building regulations, including:

- calculations of incoming sunlight and sunlight protection
- calculations in terms of lighting technology.

#### **8.28 SPECIAL REQUIREMENTS FOR ACCESSIBILITY**

Assistance in ensuring compliance with special accessibility requirements in addition to those contained in Danish building regulations, including instructions and guides to promote accessibility.

Preparation of guides, including user manuals, on the property's accessibility.

#### **8.29 ACCESSIBILITY AUDIT**

Review of accessibility.

#### **8.30 SUSTAINABILITY**



Assistance in connection with sustainability may encompass:

- environmental sustainability, including sustainable energy production, resource consumption and environmental impact
- economic sustainability, including construction economy and overall economy
- social sustainability, including user considerations, user involvement and accessibility
- technical quality, including cleaning and maintenance needs
- process quality, including cooperation, quality assurance procedures, etc., in addition to the requirements of Danish building regulations.

Assistance in connection with sustainability may be provided on various levels, depending on the nature of the project and the client's ambitions, including any certification requirements.

The services to be provided by the consultant are incorporated into the individual stages of the design phase and may comprise the following main activities:

Design specification phase:

Including initial analysis and mapping, as well as setting targets for sustainability.

Design phase:

Including:

- prioritisation of measures with a view to meeting defined targets and documentation requirements in this connection
- establishment of requirements towards suppliers and contractors and the documentation of this
- establishment of requirements towards supervision in the form of a supervision plan focusing on sustainability
- establishment of requirements towards an operation and maintenance plan
- planning of commissioning.

Construction phase:

Including:

- co-ordination of sustainability efforts on the building site
- collection of documentation

Operational phase:

Including:

- collection of operations data

- advice on sustainable operation and maintenance

### **8.31 SUSTAINABILITY CERTIFICATION**

The service may include:

- reporting performed by the certification auditor or assessor, including collection, control and organisation of the documentation required to allow a building to achieve certification in a specific class of a certification system such as DGNB, BREEAM, LEED or cradle to cradle
- implementation of life cycle assessments, analyses and costs.

### **8.32 SUSTAINABILITY MANAGEMENT**

The service encompasses the coordination of the consultants' work to meet requirements towards sustainable design and/or certification.

Sustainability management may be undertaken as part of the design management process or as a separate service in which the sustainability manager reports to the design management.

The service may include:

- adapting the sustainability plan to the design development
- ensuring that documentation is compiled for possible certification processes
- ensuring that agreed goals are met, so that the building can be certified as agreed.

### **8.33 OCCUPATIONAL HEALTH AND SAFETY**

The consultant may undertake to assist the client in its obligations towards occupational health and safety coordination of the building project during the design phases.

The consultant may undertake to assist the client in its obligations towards working environment coordination during construction.

### **8.34 SPECIAL TESTS**

Completion of laboratory and model testing.

### **8.35 CLIENT DELIVERABLES**

Responsibility for the design, tendering, purchase and coordination of any client deliverables.

### **8.36 WORKING AND ASSEMBLY DRAWINGS**

Working and assembly drawings are usually provided by the individual supplier or contractor. If it is more expedient in the relevant project that the consultant provides such drawings, a

separate agreement must be concluded with the client in this respect.

### **8.37 SIGNAGE**

Assistance in connection with signage, in addition to the signage required by Danish building regulations and other legislation, including the choice and design of signage.

### **8.38 SALES MATERIAL**

Assistance with the preparation of sales and lease material.

### **8.39 COMPLEMENTARY/ALTERNATIVE PROJECTS AND PROJECT CHANGES**

- preparation of complementary projects ordered by the client
- review of alternative projects drawn up by other consultants
- assistance in connection with the implementation of project changes (i.e. redesign work bringing the project to the same level as before the implementation of changes)
- project adjustments as a result of changes introduced by the client
- project alterations due to alternative offers, materials or construction methods by suppliers or contractors.

### **8.40 ARTISTIC DECORATION**

Assistance in connection with organisation of and negotiations for artistic decoration.

### **8.41 PREQUALIFICATION**

Assistance in connection with the implementation of a prequalification round.

### **8.42 NEGOTIATIONS UNDER THE DANISH ACT ON TENDERING PROCEDURES FOR WORK CONTRACTS**

Assistance in connection with negotiations to be conducted in accordance with the Danish Act on Tendering Procedures for Work Contracts.

### **8.43 EU PROCEDURES**

Assistance in connection with the implementation of procedures in accordance with EU public procurement directives.

### **8.44 NEGOTIATIONS UNDER EU PUBLIC PROCUREMENT DIRECTIVES**

Assistance in connection with the implementation of negotiations in accordance with EU public procurement directives.

### **8.45 DETAILED WORKS PROGRAMMES**

Preparation of detailed works programmes in addition to those described during the individual stages and phases.

### **8.46 INCREASED QUALITY ASSURANCE**

Assistance in connection with quality assurance comprising client requirements for increased or special internal quality assurance in the form of organisation and documentation of internal quality assurance as specified by the client in connection with the design and construction processes.

The consultant establishes on a spot check basis that the contractors have complied with the approved quality control plans and that documentation has been drawn up and handed over as agreed.

The consultant collects the submitted quality documentation.

### **8.47 CHANGE OF CONSULTANT**

If there is a change of consultants during the design process, the new consultant will review and check the documentation provided by the previous consultant.

### **8.48 SPECIAL MEETING ACTIVITIES DURING THE DESIGN PHASE**

Assistance in connection with special meeting activities such as preparation of material for and participation in client/user meetings, including general meetings, board meetings, political meetings and public meetings where the client's representative participates.

### **8.49 SPECIAL MEETING ACTIVITIES DURING THE CONSTRUCTION PHASE**

Holding of special start-up, coordination and technical meetings. Participants may be project follow-up, construction management and technical supervision staff.

### **8.50 INCREASED TECHNICAL SUPERVISION**

Assistance in connection with technical supervision, in addition to the supervision responsibilities described in 4.2.

In each case, the need for increased technical supervision must be assessed on the basis of the nature of the project and the qualifications of the contractors to perform adequate checks.

#### **8.51 KEY PERFORMANCE INDICATORS**

Provision of data for key performance indicators and provision of evaluations in addition to the specifications contained in the relevant Danish executive order.

#### **8.52 DISPUTES**

Assistance in connection with legal disputes between the client and contractors or suppliers, work stoppages by the contractors, completion statements, inspections and surveys and suspension of payments, insolvency or liquidation by the contractors.

#### **8.53 FIVE-YEAR INSPECTION**

Inspection is performed according to the guidelines laid down by the Danish Building Defects Fund or as otherwise agreed.

The service may also include technical assistance in connection with 5-year inspections performed by other consultants.

## 9. Glossary

### **As built**

"As built" refers to the documentation of the building as constructed.

The scope of "as built" documentation is agreed between the parties in the consultancy agreement, the description of services, and any ICT specification.

### **BIM design:**

A design process in which the designers make use of digital building models in their own design for the purpose of exchanging and communicating information on the project, and for analyses and simulations.

### **bips**

A Danish member organisation which works to promote common standards for the Danish construction industry, and which also houses the Danish BuildingSMART work. 'Bips' is an acronym derived from the Danish terms *byggeri - informationsteknologi - produktivitet - samarbejde* (construction - information technology - productivity - cooperation).

### **BREEAM**

The BRE Environmental Assessment Method is a British certification system developed by Building Research Establishment Ltd.

### **buildingSMART**

BuildingSMART is an independent international organisation that develops common open standards for the exchange of digital data.

### **CCS**

CCS (the Cuneco Classification System) is a Danish classification project founded by cuneco.

### **Classification**

A classification is a system of "objects" in classes.

Objects can for example be things, concepts or documents.

### **Cradle to cradle**

Cradle to cradle is a production and business concept that regards nature's own growth processes as a model for human production. There is no waste in this concept, but rather nutrients and materials in an eternal flow.

### **cuneco**

cuneco - the centre for productivity in construction - is a development project which until 2014 will develop, test and implement common standards for the improved exchange of data throughout all the processes of construction, from the idea phase and design to construction, operation and maintenance. The standards developed must be user-friendly and IT suitable, and are intended to be compatible with both national and international standards.

### **DBK**

*Dansk Bygge Klassifikation* (Danish Construction Classification) is a Danish classification project established by the Danish Enterprise and Construction Authority.

### **Digital building models**

Digital building models are understood to refer to object-based building models, in a technology known as BIM - Building Information Modelling.

In the "BIM Handbook" (Eastman et al., 2007) BIM is defined as: "a modelling technology and associated set of processes to produce, communicate, and analyse building models".

### **DGNB**

A German certification system developed by *Deutsche Gesellschaft für Nachhaltiges Bauen*. The Danish Green Building Council has in May 2012 established a Danish sustainability certification system based on DGNB.

### **Forvaltnings Klassifikation**

*Forvaltnings Klassifikation* (Administration Classification) is a classification system developed by the Danish National Building Foundation in co-operation with Local Government Denmark.

**ICT specification**

A specification of digital deliveries as the basis for contractual terms.

Bips has compiled the publication F202 and associated project-specific description.

**IDM**

An Information Delivery Manual is a description of stakeholders and working procedures, as well as detailed specifications of the digital information to be delivered in BIM design.

**IFC**

Industry Foundation Classes is buildingSMART's data model, which enables data exchange between different software programs used in BIM design.

**Integrated design**

A process of design and co-operation between consultants and possibly designers, suppliers and contractors, with a special focus on compliance with requirements towards, and the optimisation of, a building's energy requirements, sustainability, fire prevention measures and similar areas that require interdisciplinary coordination between various disciplines in the introductory phases of a construction project.

**Joint design**

Joint design refers to collaboration between a consultant and a contractor or supplier in which the consultant's project is processed or detailed by the consultant in cooperation with the supplier or contractor, after contracting. As an example, see bips A113, which allocates design services and responsibilities in the supply and installation of prefabricated elements of concrete and lightweight concrete.

**LEED**

Leadership in Energy and Environmental Design is an American certification system.

**Project documentation**

Project documentation is the documentation of the consultant's work in the form of drawings, calculations, memoranda, etc.

In digital design, project documentation also encompasses digital building models and other digital documentation, to the extent stipulated in the ICT specification.

**Requirements model**

A BIM model containing the client's requirements towards the construction project, such as a model of rooms specifying spatial and functional requirements.

**Supplier and contractor design**

Supplier and contractor design is understood to mean project documentation compiled by suppliers or contractors as the basis for the construction process, under the responsibility of the supplier or contractor.

As an example, see bips A113, which allocates design services and responsibilities in the supply and installation of prefabricated elements of concrete and lightweight concrete.

**Occupational Health and Safety definitions**

In relation to the purposes of Executive Order no. 574 on the duties, etc., of designers and consultants under the Working Environment Act:

- A consultant is understood to be someone who issues an opinion or statement, on request and in return for payment, which is of relevance to health and safety.
- A designer is understood to be the supplier of a design that comprises the direct basis for a building or construction project, including construction services, production plant tasks, the operation and use of technical aids, and materials that are hazardous or which could impair health and safety.

The consultant and the designer can thus both be the consultant, cf. this description of services, a designing contractor or supplier with tasks relating to the working environment, a client advisor, and/or the client itself.

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