

# Civil Works and Planning

# 2013



## **Service descriptions for Civil Works and Planning**

This description of services serves as a basis for providing consultancy in connection with civil works 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 (the Danish Association of Consulting Engineers), and DANSKE ARK (the 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 civil works projects or public sector civil works projects. Such legislation and regulations are assumed to serve as the basis for the actual civil works 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 – civil works projects as a frame of reference for determining services in the specific consultancy agreement.

Chapter 8 contains a glossary which describes selected terms used in the description of services and/or in the industry.

For civil works in which the client has specific requirements towards the use of ICT, such as digital design or digital delivery, an ICT specification should be compiled.

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), *Byggeri og Planlægning* (Building and Planning) and *Som udført* (As Built).

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 general organisation of the civil works 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 Landskabsarkitekters 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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## **8. Glossary**

## 0. Role of the consultant

The consultant is the client's independent representative and adviser, cf. ABR 89 (article 1.1, Work of the Consultant). The services provided by the consultant in connection with civil works 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 civil works 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 managing and coordinating the consultants and their interaction. 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 Civil works programme

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.

For civil works in which the client has specific requirements towards the use of ICT, the consultant shall meet the requirements defined 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 Content

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 civil works locality, including details of soil conditions, pollution, etc. The appraisal should include information on the existing public utility lines, to the extent that the need to take account of these will have a significant impact on the location of the civil works or on cable/pipe routing.

The appraisal may also include considerations of alternative suggestions regarding location, utilities routing, 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 civil works.

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

The appraisal should include a description of the client's expectations towards the lifecycle of the civil works.

The appraisal should include a description of the client's expectations towards the climatic adaptability of the civil works.

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

The appraisal must include an organisational chart for the civil works project. A description must be given of how decisions are made, including any need for partner analyses, hearings and user influence in connection with the civil works programme.

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

#### 1.1.2 Project

The appraisal may include existing drawings detailing the location and size of the civil works, as well as particulars of their nature, site develop-



ment, plot ratios, easements and restrictive covenants, zoning, etc.

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

In the case of projects which include the renovation or conversion of existing civil works, the appraisal may include preliminary surveys for use in the programme work, including an account of the use of the civil works, the environmental conditions of the area, the combination of materials used in the civil works and a structural survey.

The appraisal may include drawings showing the scale, location and/or utilities routing of the civil works.

### **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, the need for EIA screening, EIA survey, etc.

### **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 civil works programme.

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 civil works programming.

If the civil works programme is to form the basis for tendering, the client decides on the type of tendering procedure.

## **1.2 CIVIL WORKS PROGRAMME**

The civil works programme is a coordinated summary of the client's requirements and wishes for the civil works project.

The level of detail of the civil works programme is adapted to the organisation of the civil works project.

### **1.2.1 Content**

The civil works programme is drawn up on the basis of the appraisal, which lists the necessary conditions for the further development of the project.

The civil works programme may be prepared as a description (possibly in a schematic form) specifying the physical requirements for facilities, structures, installations, lighting installations and surface quality as well as the sustainability objectives to be met.

The civil works programme must set out the scope and requirements of any traffic management systems, including traffic signal and electronic variable information or instruction signs.

A statement of preliminary investigations is prepared in cooperation with other consultants, if any, listing the basic conditions of the civil works: 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 civil works programme must describe the existing utility cables and piping, and any need to re-lay or take account of these.

The civil works programme 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 civil works programme must furthermore define objectives and requirements for the preparation of one or more digital models as a basis for client reviews and user consultation, etc., during the phases of the civil works project.

The civil works programme must include an organisational chart as well as procedures for communication and cooperation between the parties involved in the civil works 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 stakeholder analysis, user consultation, etc., and the civil works programme must include a description of the client's expectations regarding stakeholder management and 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 in-

volvement of working environment coordinators during design and construction, respectively.

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

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

The civil works programme must state any special requirements towards energy needs and specify any related assumptions.

The civil works programme 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 civil works programme.

The civil works programme 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 civil works programme must include an overall assessment of the operational conditions, including any requirements towards lifetime and climate adaptability.

The civil works programme must include the QA requirements for design and construction, including requirements for supervision and construction management.

### 1.2.2 Project

The civil works programme should include drawings showing the scale, location and/or utilities routing of the civil works.

According to the nature of the project, sketches may also be prepared indicating functional principles and diagrams giving details such as area sizes, functional relationships, etc.

Drawings of any existing buildings and facilities should be included.

### 1.2.3 Programming

The civil works programme 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 civil works project.

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

- area acquisition
- demolition and clearing
- construction costs
- other costs
- VAT.

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

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.

In the civil works programme, reference is made to any EIA screening or EIA surveys that have been conducted or are in progress.

### 1.2.6 Quality assurance

The consultant reviews the civil works programme and its basis systematically to ensure that requirements for the quality of the civil works (form, function, construction technique) 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, requirements analyses and the preparation of budget limits, etc. If required, the client appoints user representatives and defines their responsibilities.

Together with the consultant, the client must ensure that:

- a civil works programme is drawn up 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 specification
- the quality level of the civil works is determined, taking into account its intended purpose
- programme requirements are consistent with the civil works' 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 civil works programme as a basis for initiating 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 civil works' architecture, landscaping, structures and installations.

The design manager also coordinates in relation to the sustainability goals of the civil works.

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

tion, and that an approved civil works programme 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 compiles a description of the special conditions/construction project on the basis of proposals made by the consultants.

The design manager ensures that the special conditions/construction project description, along with the consultants' work descriptions, defines the scopes of work and interfaces between the consultants and the designing suppliers and con-

tractors 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 or 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 the necessary permits, and finally clarifies the conditions of such permits.

### **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, special conditions/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 for other costs.

The client takes out insurance as necessary.

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 Content**

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 construction models for each phase and each trade
- management of digital communication
- management of data security
- management of the digital production of digital 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.

For civil works in which the client has specific requirements towards the use of ICT, the consultant shall meet the requirements defined 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 the consultant's area of responsibility as the basis for this coordination, including in relation to energy needs, etc.

The consultant must perform the consultant's obligations as a designer in accordance with health and safety legislation, and must contribute within

the consultant's own area of expertise 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 civil works programme.

##### 3.1.1 Content

The outline proposal contains a description of the basis of the proposal, including its preconditions, aesthetic concept, functions and sustainability, and proposals for the general choice of materials, construction technical principles as well as considerations of operation and maintenance.

##### 3.1.2 Project documentation

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

Landscape architect/architect:

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

Engineer:

- a description and sketches of the design principles for the construction design and important structures
- a description and sketches of the extent and design of systems, an assessment of capacities and supply principles.

In digital design, the scope of the digital models is determined in an ICT specification, such that co-

ordinated models and project documentation can be supplied in digital form.

### 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, grouped under relevant main items.

This estimate will generally include:

- area acquisition
- demolition and clearing
- public utilities connection fees
- earthworks
- cable, piping and drainage works
- utilities re-laying
- reinforcement and surface works
- construction work
- installation work
- planting
- fittings, fixtures and equipment
- artistic decoration
- any temporary measures
- building site costs and measures taken in respect of weather conditions
- environmental charges and other public taxes
- administration and costs, including construction management and technical supervision, reproduction, other costs and client administration
- contingencies
- VAT.

The estimate is generally prepared on the basis of estimated unit prices, based on the project's main quantities – typically length and surface measurements. If the civil works consist of several units, the units are assessed separately.

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

### 3.1.5 Authorities

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 in the necessary meetings during the process of drawing up the outline proposal.

The client prepares a budget for the client's other expenses, such as special completion work 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 Content

The project proposal is the basis upon which the client decides on the aesthetic, functional, technical and financial solution for the project in question, together with principles of operation and maintenance, and financing.

All investigations, including the 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:

Landscape architect/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 and buildings
- a description of surfaces, plants and trees, ground structures and equipment, and all main levels and material earthworks must also be included
- a description of areas.

Engineer:

- a description of the main design principles and structures, calculations of estimates, a description of the main statics system for the structures and the governing load scenarios
- plan drawings 1:200/1:500 and sections that show all significant geometric data
- a description of the extent, design and main components of installations
- plan drawing with installations.

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

### 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 the consultant's 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 civil works project, the budget is divided into the following main items:

- area acquisition
- demolition and clearing
- public utilities connection fees
- earthworks
- cable, piping and drainage works

- utilities re-laying
- reinforcement and surface works
- construction work
- installation work
- planting
- fittings, fixtures and equipment
- artistic decoration
- any temporary measures
- 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 decisions.

The budget must contain information on:

- the price index used and agreements on any price adjustments
- the intended type of tendering procedure
- other preconditions 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 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 civil works programme towards the general quality of the civil works (form, function, construction technique) as well as costs and programming have been met

- 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 in the necessary meetings during the process of drawing up the project proposal.

The client approves the overall budget and updates the budget for other costs.

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 Content

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 intentions, choice of design, choice of materials and MEP systems.

### 3.3.2 Project documentation

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

The landscape architect/architect draws up an account of the project relative to planning, laws and regulations, including any necessary exemptions.

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

### 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 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
- regulatory requirements towards the design, function and construction method of the civil works have been met.
- the preliminary project (regulatory project) can, together with the project proposal, 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 the client's 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 regulatory approval, as well as for tendering, contracting and construction.

#### 3.4.1 Content

The main project must include a list of documents, special conditions/building project description, work specifications, drawings, a time schedule and schedules of rates with quantities.

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 consultant draws up a draft inspection plan for the technical supervision.

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 special conditions/building 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:

Landscape architect/architect:

- work specifications
- schedules of rates with quantities, together with a description of the measurement methods and the basis for the quote and price calculation
- drawings, comprising general drawings, layout drawings and detail drawings
- updates of area calculations in relation to regulatory approvals.

Engineer:

- work specifications
- schedules of rates with quantities, together with a description of the measurement methods and the basis for the quote and price calculation
- drawings, comprising general drawings, layout drawings, installation drawings and detail drawings
- reviews of other consultants' load requirements that affect structural capacities
- dimensioning, including any statics calculations
- electrical distribution panels, including power circuits
- report on openings through structures and their setting out.

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

#### 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 redesign work.

#### **3.4.5 Authorities**

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 reviewing 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.

#### **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 necessary.

### **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 Content**

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, it must be ensured 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 the consultant's technical field.

### **3.5.2 Project documentation**

The consultant collects updated project documents, including any digital 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 the regulatory 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 permission to begin using the civil works within the consultant's area of responsibility.

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

### **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 the consultant's 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

For civil works in which the client has specific requirements towards the use of ICT, the consultant shall meet the requirements defined in the consultancy agreement and associated ICT specification.

### 4.1 CONSTRUCTION MANAGEMENT

A construction manager is appointed before the construction process commences. The construction manager monitors the overall progress of the civil works 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 Content

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 the 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 the construction manager agrees how to address such problems or changes.

The construction manager reports to the client on the progress of the 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 handover 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 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 civil works 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 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 civil works 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 construction 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 civil works project in terms of costs and, in cooperation with the site supervisor, arranges for additional payments made during the construction of the civil works 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 permission to begin using the civil works.

#### 4.1.5 Quality assurance

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

The construction manager 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 competencies 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 participates in the handover 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 Content

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 models are handed over to the contractors.

The site supervisor provides the construction manager with the information the construction manager needs to perform the coordinating and administrative functions.

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

The site supervisor draws up defects lists for the handover meeting and ensures 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 defects lists for the 1-year inspection and ensures that defects are remedied.

### 4.2.2 Documentation

The site supervisor prepares supervision notes and reports on building site staffing and equip-

ment, 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 statements of completion 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 the commissioning and operation of the civil works (civil works and any buildings).

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 operations.

### 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 the civil works and component elements.

The operation and maintenance plan describes operational activities and inspection routines required to ensure that the civil works will operate adequately after handing-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 civil works 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 civil works and listing estimated

dates for the replacement of 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 drawn up for the purpose of describing routine work to be performed throughout the year as well as the expected development of the vegetation and fixing over a number of years, and 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 civil works 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 that has been drawn up.

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

### 5.3 ASSISTANCE WITH OPERATIONS

The client is responsible for the operation of the civil works. 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 oper-

ation and maintenance plan is updated, and that maintenance is performed in a technically correct manner.

The extent of assistance must be defined for the individual civil works 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 preventative 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 may monitor the development of the facility and, in consultation with the client, make possible 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. Planning consultancy

The consultant may, as agreed between the parties, provide assistance in connection with general plans for building and civil works 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 construction work.

The various types of planning are listed in 6.1, whereas consultancy stages and services in connection with planning are specified in 6.2-6.9.

### 6.1 PLANNING TASKS

Planning tasks tasks comprise the following:

- 6.1.1 Summary plans
- 6.1.2 Sector plans
- 6.1.3 EIA
- 6.1.4 Other tasks

#### 6.1.1 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.

#### 6.1.2 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.

#### 6.1.3 EIA (Environment Impact Assessment)

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

An EIA is compiled on the basis of a specific large-scale project, and comprises an assessment of the environmental impact of the project in general terms. EIAs take the form of regional plan supplements.

#### 6.1.4 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 the organisation and holding of competitions
- organisation of and participation in conferences and seminars
- preparation of publications, exhibition materials, etc.
- logistics, for example in connection with the design and construction of large traffic works

- 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 6.1.1-6.1.3, above.

## 6.2 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. The 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.

The brief and the work programme derived from this 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 background material, such as relevant data and maps.
- a specification of the services to be provided by the client and the consultant, respectively
- the form of presentation and communication
- the extent to which meetings are included in the agreement (and a list specifying such meetings, if required)
- a handover 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.

## 6.3 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.

## 6.4 PROBLEM DESCRIPTION

An analysis and an assessment of the existing situation, and thus an identification of problems, is drawn up on the basis of the documentation obtained. This may encompass 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.

## 6.5 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.

## 6.6 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.

## 6.7 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.

## 6.8 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.

## 6.9 PUBLIC COMMENT PROCEDURES

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

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

## 7. 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 the services included must be specified in the agreement.

### ICT in civil works

#### 7.1 CLASSIFICATION

Classification of digital project information through the use of a common classification. In classification, the system, purpose and scope of the classification is defined in an ICT specification.

#### 7.2 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, Internet websites, tele- or video conferencing systems and social media. The service must be defined in an ICT specification.

#### 7.3 ESTABLISHMENT OF COMMUNICATION PLATFORM

The service may involve the establishment and operation of a common digital communications platform (project web). The service must be defined in an ICT specification.

#### 7.4 DIGITAL MODELS

The service comprises the construction of one or more digital models as the basis for coordinated design, analysis and project documentation. To the extent that the models form the basis for project documentation, they must be supplied, to-

gether with the project documentation, at the client's request. The exchange and delivery of digital models must be defined in an ICT specification.

#### 7.5 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.

#### 7.6 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.

#### 7.7 INTERNET PORTAL

Establishment and operation of a publicly-accessible Internet portal with information about the project for users, citizens and other stakeholder groups.

### Other services

#### 7.8 REGISTRATION OF EXISTING CONDITIONS

Compilation of a register of existing conditions.

This comprises an assessment of the condition of the civil works before rebuilding, and serves as documentation for the owner and the authorities.

The registration covers those parts of the civil works included in the renovation and refurbishment, as well as adjacent parts, to the extent that these involve a risk of damage to the planned works.

Registration may also include surrounding civil works or buildings, if these may be affected by the construction work.

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

The registration process can be extended with surveys, measurement and mapping of existing areas, civil works, photographic registration of existing conditions, recording of archaeological investigations and relevant archive research.

### **7.9 DIGITALISATION OF EXISTING CONDITIONS**

The service encompasses the digitalisation of the existing civil works and possible buildings in digital models or drawings, to the extent agreed.

### **7.10 LANDSCAPE ANALYSIS**

Assistance in the analysis of a landscape's history, culture, geography, topography, flora, fauna, climate, etc., in connection with the preparation of an appraisal.

### **7.11 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.

Implementation 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.

Following-up during the construction phase.

### **7.12 GEOPHYSICAL SURVEYS**

Implementation of geophysical borehole logging as a supplement or substitute for the geotechnical investigations.

Geophysical surface mapping, for example using geoelectric resistivity measurements, georadar or seismic data to map the characteristic geological formations, and to correlate the borehole data.

### **7.13 HYDROGEOLOGICAL INVESTIGATIONS**

Implementation of hydrogeological studies based on existing geological and hydrogeological information.

Implementation of brief or longer pumping tests to determine the hydraulic parameters for dimensioning of dewatering plant and reinfiltration plant.

Official approvals, supervision and follow-up during operation of civil works.

### **7.14 ENVIRONMENTAL INVESTIGATIONS**

Collection of basic information about the area of the civil works and compilation of history, including assessment of the likelihood of pollution and contamination and the nature of such pollution and contamination.

Implementation and documentation of interviews with plot owners and other relevant stakeholders in order to assess the possibility and nature of contamination sources.

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

Implementation 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 preventative measures and estimates of the costs of such remediation.

Following-up during the construction phase.

Negotiation with authorities.

**7.15 NOISE AND VIBRATION**

Measurements of existing noise conditions and the planning and design of appropriate measures to reduce noise and vibration both during construction work and from the finished installation.

**7.16 OFFICIAL DUTIES**

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

Preparation of appropriate documentation of the result of any such duties and negotiations, etc.

**7.17 RISK ANALYSIS AND RISK MANAGEMENT**

Implementation of analyses of specific risk factors, such as in relation to:

- occupational health and safety
- soil conditions
- damage to the civil works or the surroundings
- delays
- budget overruns in relation to the design, implementation or operation of the civil works.

Management of identified risks.

**7.18 OCCUPATIONAL HEALTH AND SAFETY**

The consultant may undertake to assist the client in the client's obligations towards occupational health and safety coordination during the design phases.

The consultant may undertake to assist the client in the client's obligations towards occupational health and safety coordination during construction.

**7.19 COST ANALYSES**

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

Preparation of special estimates, 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 civil works.

**7.20 INSURANCE**

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

**7.21 PROCESS MANAGEMENT/CONSULTANCY**

Organisation of stakeholder and user consultation, including arranging special user seminars, compiling communication plan, etc.

Team building, including arrangement of workshops, start-up seminars, etc., in connection with the planning and completion of the civil works project.

Implementation of final evaluation.

**7.22 VISUALISATION**

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

**7.23 COMPLIANCE WITH SPECIAL REGULATORY REQUIREMENTS**

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

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

**7.24 SPECIAL REQUIREMENTS FOR ACCESSIBILITY**

Assistance in ensuring compliance with special accessibility requirements in addition to specific-



tions, cf. the Danish Building Regulations, Highway Code, and other legislation.

Preparation of guides, including user manuals, on the accessibility of the civil works.

### **7.25 ACCESSIBILITY AUDIT**

Assistance with accessibility audit to assess whether the traffic regulation "Circulation areas for all" has been observed.

### **7.26 TRAFFIC SAFETY AUDIT**

Assistance with traffic safety audit to assess whether the civil works conforms with traffic safety rules.

The traffic regulation "Road safety audit and inspection" may be applied.

### **7.27 LIGHTING SYSTEMS**

Consultancy services for lighting systems, beyond what is described as belonging to the consultant's area in the civil works programme.

### **7.28 SIGNAGE CONSULTANCY**

Consultancy beyond road signs of type A, B, C, D and E and road markings in accordance with the Road Traffic Act.

Assistance in connection with the establishment of other road signs, information signs and direction signs, plus the creation of portals for all boards, can be provided by agreement.

### **7.29 TRAFFIC MANAGEMENT SYSTEMS**

Assistance in connection with lighting systems, beyond what is described as belonging to the consultant's area in the civil works programme.

### **7.30 TRAFFIC DIVERSION DURING CONSTRUCTION**

Assistance in connection with measures to maintain traffic flow during the construction period, if the necessary measures are so complex that the contractor cannot be required to provide them.

This may for example include temporary traffic management systems, signage and road markings.

### **7.31 SUSTAINABILITY**

Assistance in connection with sustainability may encompass:

- environmental and climate sustainability, including sustainable energy production, resource consumption, environmental impact and climate adaptation
- economic sustainability, including construction finances 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 requirements, cf. civil works programme.

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:

#### **Civil works programme 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.

### **7.32 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 civil works to achieve certification according to a certification system
- implementation of life cycle assessments, analyses and costs.

### **7.33 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 civil works can be certified as agreed.

### **7.34 SPECIAL TESTS**

Completion of laboratory and model testing.

### **7.35 CLIENT DELIVERABLES**

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

### **7.36 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.

### **7.37 FITTINGS, FIXTURES AND EQUIPMENT**

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, such as waste containers, benches, picnic tables, playground equipment, information boards, bicycle racks, planters, advertising signs, fences, noise barriers, railings, protective structures and the like.

### **7.38 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.

### **7.39 "AS BUILT"**

"As built" services are provided to bring the project documentation to a level at which these documents and the project as completed are consistent with one another to a specified extent, beyond the updating of the regulatory project necessary to achieve official approval and permission to begin use of the civil works within the consultant's area of responsibility.

### **7.40 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.

#### **7.41 ARTISTIC DECORATION**

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

Assistance in connection with the co-ordination and incorporation of artistic decoration into the civil works.

#### **7.42 PREQUALIFICATION**

Assistance in connection with the implementation of a prequalification round.

#### **7.43 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.

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

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

#### **7.45 DETAILED WORKS PROGRAMMES**

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

#### **7.46 SPECIAL QUALITY ASSURANCE**

Assistance in connection with quality assurance comprising client requirements for special quality assurance in the form of organisation and documentation of internal quality assurance as speci-

fied by the client in connection with the design and construction processes.

#### **7.47 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.

#### **7.48 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.

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

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

#### **7.50 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.

#### **7.51 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 or the suppliers.

**7.52 FIVE-YEAR INSPECTION**

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

## 8. Glossary

### As built

"As built" refers to the documentation of the civil works 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.

### bips

A Danish member organisation which works to promote common standards for the Danish construction industry. "bips" is an acronym derived from the Danish terms *byggeri – informationsteknologi - produktivitet - samarbejde* (construction - information technology - productivity - cooperation).

### Classification

A classification is a system of "objects" in classes. Objects can for example be things, concepts or documents.

### Digital models

The term "digital models" refers to object-based models.

### EIA

The EIA (Environmental Impact Assessment) provides a description of how a construction project or civil works project will affect the surrounding environment.

An EIA screening is a preliminary survey to determine whether EIA is obligatory for a particular building or civil works project.

### ICT specification

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

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

### 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.

### Occupational Health and Safety definitions

In relation to the purposes of the executive order 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.

A working environment coordinator is understood to mean a person duly authorised by the client to handle working environment coordination on behalf of the client, cf. the executive order on the duties of the client in the design phase and construction phase, respectively.

**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.

**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.



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