

G(h)

# ACE Schedule of Services – Part G(h)

Mechanical and electrical engineering  
(performance design in buildings)  
For use with ACE Agreement 3 –  
Design and Construct

2009 Edition (Scotland)



**ace**  
**agreements**

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This is Part G(h) referred to in the foregoing *Memorandum of Agreement*

## Part G: Schedule of Services for a Consultant appointed by a Design and Construct Contractor

### Mechanical and electrical engineering (performance design in buildings)

#### G1 GENERAL

##### G1.1 Definitions

The following definitions shall apply throughout this Part G.

**Coordination Drawings** Drawings showing the inter-relationship of two or more engineering services and their relation to the structure and architectural details. Such drawings should be provided to a scale of not less than 1 to 50 unless otherwise agreed and be prepared in such detail as to demonstrate that the engineering services will be properly separated from one another and can be satisfactorily installed and maintained. The Coordination Drawings shall, if the Consultant be so instructed, embrace other engineering services not designed by him.

**Cost Plan** A document showing the estimated cost of all parts of the Project and how it is spent.

**Installation Drawings** Drawings based on Tender Documentation and/or Coordination Drawings showing details of proposals by Contractors or Sub-Contractors for the execution of the Works. The Installation Drawings will be in such detail as to enable the Works to be installed.

**Record Drawings** Drawings normally prepared by a Sub-Contractor in order to create a record of the Works as installed.

**Sketch Drawings** Line diagrams and layouts indicating basic proposals, locations of main items of plant, routes of main pipes, air ducts and cable runs in such detail as to illustrate the incorporation of the engineering services within the Project as a whole.

**Stages** The stages for the performance of the Services as described in this Part G.

**Tender Documentation** Drawings and other documentation by or for the Contractor to enable Sub-Contractors to interpret the design for the Project or the Works and to submit tenders to the Contractor for all or any part of the Works.

## **G1.2 Scope**

The Consultant has no obligation to supervise, inspect or comment upon the Contractor's workmanship and the services are confined to design and advisory matters only.

## **G2 THE SERVICES FOR MECHANICAL AND ELECTRICAL ENGINEERING**

*Note 1: Each of the services in this Part G is optional and may be deleted.*

*Note 2: The services are not divided into Pre-Tender and Post-Tender Stages. It will be necessary to identify which are the Pre-Tender Services and Post-Tender Services if the first alternative clause B2 of Part B: The Particulars of Agreement applies.*

### **G2.1 Appraisal Stage**

G2.1.1 Seek the Brief and instructions from the Contractor describing the Contractor's requirements in respect of the Works, what they are intended to achieve, their cost and programme.

G2.1.2 Discuss with the Contractor the role of the Consultant and his relationship with Other Consultants, the various Sub-Contractors and any CDM co-ordinator appointed in accordance with the Construction (Design and Management) Regulations 2007.

### **G2.2 Strategic Briefing Stage**

G2.2.1 Seek from the Contractor all information and documents to be provided by the Contractor under clause F3.2 of Part F: *The Terms of Contract*.

G2.2.2 Obtain such information as is reasonably available from documents on the existence and extent of public services such as water, gas, electricity, sewerage and telecommunications services and comment to the Contractor on any effect that these may have on the Works, both during construction of the Works and on completion.

G2.2.3 Comment to the Contractor on any physical site restrictions which may affect the engineering options for the Works.

G2.2.4 Collaborate with any Other Consultants in seeking from the Contractor any further information needed so that they can perform their services under their various agreements with the Contractor.

G2.2.5 Collaborate with any Other Consultants in making initial recommendations to the Contractor on the technical viability of the Works.

G2.2.6 Seek the Contractor's consent to proceed to the Outline Proposals Stage.

## G2.3 Outline Proposals Stage

After receiving the Contractor's consent to proceed to the Outline Proposal Stage:

- G2.3.1 Visit the site as necessary and study data and information relating to the Project and relevant to the Works which are reasonably accessible to the Consultant, and consider reports relating to the Works which have either been prepared by the Consultant or have been prepared by others and made available to the Consultant by the Contractor.
- G2.3.2 Advise the Contractor on the need for arrangements to be made for and define the extent of topographical and dimensional surveys of the site, surveys to obtain details of construction in existence on or adjacent to the site, special investigations or model tests.
- G2.3.3 Consult any local or other authorities about matters of principle in connection with the design of the Works.
- G2.3.4 Consider alternative outline solutions for the Works.
- G2.3.5 Develop the Contractor's Brief into a full Brief for the Works in consultation with the Contractor and any Other Consultants. Such Brief shall describe the Contractor's requirements in respect of the Services and both the Contractor and the Consultant shall work to the Brief. Discuss and agree with the Contractor any changes to the arrangements for payments to be made to the Consultant which may have become necessary as a result of changes to the Brief.
- G2.3.6 Provide sufficient preliminary information in relation to the Works in the form of advice, sketches, reports or outline specifications to enable any Other Consultant to prepare his outline proposals and assist any Other Consultant to prepare the outline Cost Plan.
- G2.3.7 Provide by way of Sketch Drawings or schedules the structural planning requirements for the engineering services showing locations and approximate sizes of plant rooms, major items of plant, major ducts and service runs and provide the approximate weight of any item affecting the structural design.
- G2.3.8 Assess and prepare preliminary schedules of power, heating and cooling loads as applicable.
- G2.3.9 Receive from the architect through the Contractor the thermal performance standards for the facades and roofs of the buildings and details, of any external shading/solar control. Analyse the preliminary heat gains and losses for the purpose of initial sizing of heating, ventilation and air conditioning systems and plant, as applicable.
- G2.3.10 Negotiate with public and other utility authorities for provision of necessary incoming services.
- G2.3.11 Prepare outline specifications and Sketch Drawings for the Works.

G2.3.12 Advise on conditions of contract relevant to the Works and upon forms of tender and invitations to tender for the Works.

G2.3.13 Advise the Contractor as to the selection of firms suited to the submission of competitive tenders for the development of designs and execution of the Works, based upon documentation produced under G2.3.11.

G2.3.14 Assemble documentation and drawings for issue to firms selected to tender and despatch to suit an agreed procedure.

G2.3.15 Comment on the preparation of formal contract documents relating to selected tenders for carrying out the Works or any part thereof.

G2.3.16 After review, seek the Contractor's approval of the outline proposals and the Contractor's consent to proceed to the Detailed Proposals Stage.

#### **G2.4 Detailed Proposals Stage**

After receiving the Contractor's approval of the outline proposals and the Contractor's consent to proceed to the Detailed Proposals Stage:

G2.4.1 Analyse the tenders received and make recommendations to the Contractor on selection.

G2.4.2 Monitor, by such means as the Consultant shall consider necessary, the performance of Sub-Contractors in the evolution of system designs from the specification and Sketch Drawings.

G2.4.3 Submit a report to the Contractor commenting upon the performance of Sub-Contractors to the end of this Stage.

G2.4.4 Seek the Contractor's consent to proceed to the Final Proposals Stage.

#### **G2.5 Final Proposals Stage**

After receiving the Contractor's consent to proceed to the Final Proposals Stage:

G2.5.1 Monitor, by such means as the Consultant shall consider necessary, the performance of Sub-Contractors in the development of the system designs.

G2.5.2 Seek the Contractor's consent to proceed to the Production Information Stage.

#### **G2.6 Production Information Stage**

After receiving the Contractor's consent to proceed to the Production Information Stage:

G2.6.1 Monitor, by such means as the Consultant shall consider necessary, the performance of Sub-Contractors in the production of Coordination Drawings and Installation Drawings.

G2.6.2 Submit a report to the Contractor commenting upon the performance of Sub-Contractors to the end of this Stage.

G2.6.3 Seek the Contractor's consent to proceed to Mobilisation, Construction and Completion Stage.

### **G2.7 Tender Documentation and Tender Action Stage**

Note: Where the Consultant performs Performance Services, the services for this Stage are discharged in the Outline Proposals Stage.

### **G2.8 Mobilisation, Construction and Completion Stage**

After receiving the Contractor's consent to proceed to the Mobilisation, Construction and Completion Stage:

G2.8.1 Examine Sub-Contractors' proposals for the execution of the Works insofar as these reflect upon the design intent. Comment to the Other Consultants as may be necessary.

G2.8.2 Examine, subsequent to setting to work and regulation of the mechanical, electrical and other building services, installations, plant and equipment comprising the Works by Sub-Contractors, the result of their commissioning and the documentary records thereof. Report to the Contractor.

G2.8.3 Inspect the Works on completion and record any defects.

### **G3 OTHER SERVICES TO BE PERFORMED BY THE CONSULTANT**

G3.1 Prepare any report or documentation required for consideration of proposals for alternative works.

G3.2 Work done in connection with any application by the Contractor for any order, sanction, licence, permit or other consent, approval or authorisation, necessary to enable the Works to proceed including planning consents or approvals.

G3.3 Prepare a questionnaire for the Contractor following study of information provided by the Contractor under clause F3.2 of Part F: *The Terms of Contract* to seek the Contractor's strategic brief confirming key objectives and constraints.

G3.4 Work in connection with providing a feasibility study.

G3.5 Work in commenting on quotations for equipment, reporting upon offers received and in selecting equipment.

G3.6 Work in re-evaluating all parts of the services and building design which may be affected by acceptance of alternative plant selections.

G3.7 Prepare a report in consideration of any alternative plant selections or arrangements proposed subsequent to the issue of the Tender Documentation.

Advise whether the alternative complies with any established performance criteria. Identify the estimated cost and programme for carrying out a detailed re-evaluation of the design to incorporate the alternative proposals.

- G3.8 Develop energy efficient strategies for the fabric and engineering services of buildings in respect of the Project or the Works.
- G3.9 Develop a condensation analysis in respect of the Project or the Works.
- G3.10 Work in undertaking a detailed analysis and preparing a report affecting the selection of energy sources.
- G3.11 Evaluation of the acoustical requirements of the building design and construction with respect to design noise criteria.
- G3.12 Measurement and analysis of ambient noise levels, giving general building acoustic advice.
- G3.13 Review and update as necessary the general considerations affecting the selection of energy sources.
- G3.14 Work in connection with assisting the architect in obtaining Building Regulation compliance (Part L).
- G3.15 Comment to the Contractor on the value of any variations to the Works for which the Contractor or any Sub-Contractor was responsible.
- G3.16 Assist in negotiating any contract and/or sub-contract selected other than by competitive tendering.
- G3.17 Prepare a cost analysis of the Works as developed at any Stage.
- G3.18 Receive and comment on copies of Record Drawings, operating instructions and maintenance manuals prepared by the Contractor or Sub-Contractors if so required under their contracts for construction.
- G3.19 Prepare operating and maintenance manuals, planned maintenance schedules, Record Drawings and estimates of cost in use.
- G3.20 Assess all data relating to the Works for settlement of the Contractor's final account. Report to the Contractor.
- G3.21 Perform work or advise the Contractor on one occasion only in connection with any claim or matter where such claim or matter arises out of any contract for the execution of the Works provided that this service shall not extend to the detailed examination of any financial claim nor to advising the Contractor following the taking of a step in or towards the resolution of any dispute or difference or towards any adjudication, arbitration or litigation in connection with the Works.

**G4 SERVICES TO BE ARRANGED BY THE CONSULTANT AND TO BE PERFORMED BY OTHERS**

- G4.1 Identifying and finding a suitable third party to undertake any specialist work required, recommending that third party to the Contractor and dealing with any necessary pre-qualification matters, tenders, tender assessments and contract documents leading to a contract between the Contractor and the third party for:
- G4.1.1 Specialist technical advice on any aspect of the Works which is not within the expertise of the Consultant.
  - G4.1.2 Specialist technical advice on the control and exclusion of environmental hazards including methane and radon.
  - G4.1.3 Advice on building leakage and pressure testing.
  - G4.1.4 Legal, financial and professional services other than those offered by the Consultant and within the competence of the Consultant.
  - G4.1.5 Services in connection with the valuation, purchase, sale or leasing of lands and the obtaining of wayleaves.
  - G4.1.6 Topographical, dimensional, condition or analytical survey of sites or existing works.
  - G4.1.7 Model tests or special investigations under G2.3.2.
  - G4.1.8 Preparation, or assistance in the preparation, of an environmental impact assessment in respect of the Works.
  - G4.1.9 Evaluation of complex or novel builders work devices for natural ventilation of buildings including flues and towers.
  - G4.1.10 Commissioning and testing procedures and the preparation of all necessary associated documentation for permanent record thereof.