

## PART 3: SCOPE OF WORK

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## C3.1: EMPLOYER'S SCOPE

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# 1 Description of the services

## 1.1 Executive overview

The Brenner shunt capacitor Project requires two (2) new shunt capacitor banks at Brenner substation rated 48 MVAR each at 88 kV system voltage level. The harmonic and switching study is required to determine the need and sizing of filter requirements for new shunt capacitor banks, which will be installed at the Transmission substation situated in the Central Grid, Gauteng Province. The installation of the new capacitor banks will improve the reactive power compensation and the voltage control resolution at the substation. The filter will mitigate harmonic distortion violations and harmonic amplifications as to comply with quality of supply standards where required. The switching part of the study will identify and rate switchgear equipment to adequately meet any filter mitigation requirement identified.

## 1.2 Interpretation and terminology

The following abbreviations are used in this Scope:

Abbreviation	Meaning given to the abbreviation
ECSA	Engineering Council of South Africa
SACPCMP	South African Council for Project and Construction Management Professionals
Cap Bank	Capacitor Bank
PM	Project Manager
SS	Sub station
FAT	Factory Acceptance Test
RTS	Real Time Simulation
SAT	Site Acceptance Testing

# 2 Specification and description of the services

The content of this section is the meat of the scope of work and will depend on the nature of the services required. The *Consultant* may be appointed for a wide range of duties. The range is almost limitless but would typically include:

- Provide services of an advisory or specialist nature.
- Conduct training on an ad hoc basis.
- Manage a service or facility on behalf of the *Employer*.
- Develop a software application and then implement it throughout the *Employer's* organisation.
- Act as the architect for the design and supervision of a new building.
- Act as the engineer for the design of a new project or structure.
- Act as a cost engineer or quantity surveyor on a project.
- Act as the *Project Manager* in terms of an ECC contract or as a project manager for a total project.
- Act as the *Supervisor* in terms of an ECC contract.

Professional services contracts are by nature specialised and it would be impractical to prescribe formats here to cover such a wide range of duties as those listed above.

For engineering and construction services, document compilers are advised to consult a paper issued by CIDB entitled, "A generic scope of work for services relating to construction works. 18 October 2006".

This paper identifies a generic format as well as giving guideline scope of services for the appointment of members of the various statutory councils operating in South Africa such as ECSA, SACQSP, SACAP and SACPCMP.

The Construction Industry Council (UK) has developed a generic approach suitable for the appointment of most professional disciplines in the engineering and construction sector. This requires the Scope to be compiled for stages of the services associated with a project and is described on pages 1 and 3 of the above referenced paper. If this approach were to be followed, this section could be developed as follows:

The scope of the study comprises:

- Steady state switching studies to determine violations of the maximum change in steady state voltages due to switching of the capacitors
- Frequency scanning studies to determine the network resonances with various combinations of capacitor switching configurations
- Harmonic load flow studies to determine voltage violations at each harmonic frequency arising from the assumed harmonic current injections and network resonances
- Identification of filter requirements and selection of the most appropriate filter(s) to mitigate the harmonic violations. The aim is to determine if the bank should remain as a shunt bank or be converted to a filter.
- Transient switching studies to establish the transient recovery voltages (TRVs) and inrush currents due to capacitor switching.
- The study shall be conducted for the horizon period 2020-2030.
- Background harmonic measurements shall be supplied by Eskom
- Confirmation that the capacitor bank sizing is still adequate and required by the system

The study shall be conducted at the following substation:

No	Substation	Description	Location	GPS Co-ordinates
1.	Brenner substation	Two new shunt capacitor banks are required on the 88kV busbar rated, 48 MVAR.	Gauteng Province, Central Grid	-26.27887S 28.27720E

The following minimum criteria shall be used to conduct the harmonic integration studies:

- All future Network Expansions as per Case File
- All major N-1 contingencies to be used when frequency scan is performed
- High and Low load conditions
- Operational status of bus couplers and bus sections
- Filter solutions to be rated to operate at maximum continuous operating voltage, UM
- Planning versus Compatibility Levels as per NRS048 standard to be included where filter ratings are determined
- Impact on existing compensation devices
- Tuned versus de-tuned filter solutions to be considered
- Filter solution selection to consider Network Losses
- Filter solutions to optimise and support interchangeability of component ratings between various shunt capacitor substations and installations.

## 2.1 Stage 1 Preparation

Not applicable

## 2.2 Stage 2 Concept

Not applicable

## 2.3 Stage 3: Design development

Not applicable

## 2.4 Stage 4: Production information

Not applicable

## 2.5 Stage 5: Manufacture, Installation and Construction Information:

Not applicable

## 2.6 Stage 6: Post Practical Completion

Not applicable

# 3 Constraints on how the *Consultant* Provides the Services.

## 3.1 Management meetings

The *conditions of contract* (e.g. Clause 15.2) and other sections of this Scope may require that a meeting be held. However the intention of all NEC contracts is that the Parties and their agents use the techniques of partnering to manage the contract by holding meetings designed to pro actively and jointly manage the administration of the contract with the objective of minimising the adverse effects of risks and surprises for both Parties.

Depending on the size and complexity of the *services*, it is probably beneficial for the *Employer's Agent* to hold a weekly risk register meeting (Clause 15.2). This could be used to discuss compensation events, sub consulting, overall co-ordination and other matters of a general nature. Separate meetings for specialist activities such as programming and activities of a technical nature may also be warranted.

Describe here the general meetings and their purpose. Provide particulars of approximate times, days, location, and attendance requirements, stipulating that attendees shall have the necessary delegated authority to make decisions in respect of matters discussed at such meetings. The following text could be used as a model for this section:

Regular meetings of a general nature may be convened and chaired by the *Employer's Agent* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register and compensation events	As and when required	Site or MsTeams	Cross functional team
Overall contract progress and feedback	As and when required	Site or MsTeams	<i>Employer's Agent</i> , <i>Consultant</i> and other Cross functional team members

Meetings of a specialist nature may be convened as specified elsewhere in this Scope or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *services*. Records of these meetings shall be submitted to the *Employer's Agent* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

### 3.2 *Consultant's key persons*

State any additional constraining requirements on *Consultant's key persons* over and above those already stated in clause 22.1 or in the Contract Data. Such as need to notify contact details, leave and mentoring requirements where applicable. This section could be used to solicit an organogramme from the *Consultant* showing his people and their lines of authority / communication. This would be essential if the *Consultant* is a Joint Venture.

### 3.3 Provision of bonds and guarantees

Not Applicable

### 3.4 Documentation control and retention

#### 3.4.1 Identification and communication

All contractual communications will be in the form of properly compiled letters or forms attached to e mails and not as a message in the email itself. State any particular routing requirements but note from PSC3 who issues what to whom.

#### 3.4.2 Retention of documents

Clause 13.6 states that the Consultant retains copies of drawings, specifications, reports and other documents which record the services in the form stated in the Scope. Note the time period for which the Consultant is to retain such documents is the period for retention stated in the Contract Data.

### 3.5 Records and forecasting of expenses

First read clause 21.3 (Option A) and additional requirements is submission of forecast rate of invoicing.

### 3.6 Records and forecasting of the Time Charge

Not Applicable

### 3.7 Invoicing and payment

Clause 50.2 states invoices submitted by the Consultant include the details stated in the Scope to show how the amount due has been assessed.

The following details shall be shown on or attached to each Invoice to show how the amount due has been assessed:

The *Consultant* shall address the tax invoice to *Employer* and include on it the following information:

- Name and address of the *Consultant* and the *Employer's Agent*;
- The contract number and title;
- *Consultant's* VAT registration number;
- The *Employer's* VAT registration number 4740101508;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

A copy of the invoice along with the supporting documents (all copies) shall be emailed/delivered to the supply manager in order for him/her to assess and create the Goods Receipt (GR) before payment can be

made upon submission of the original invoice with the GR Number included to the Eskom Accounts Payable Department.

### **3.8 Contract change management**

This section is intended to deal with any additional requirements to the compensation event clauses in section 6 of the core clauses; such as the use of standard forms. Not the same thing as documentation control.

### **3.9 Inclusions in the programme**

First read clause 31.2 and then include here any matters regarding the order and timing of the work of the Employer and Others which the Consultant is take account of in his programme. Also describe any information other than that already requested in clause 31.2 which the Consultant is to show on each programme he submits for acceptance.

### **3.10 Quality management**

#### **3.10.1 System requirements**

Clause 40.1 requires that the Consultant operate a quality management system as stated in the Scope.

#### **3.10.2 Information in the quality plan**

Clause 40.2 requires that the Consultant provide a quality policy statement and quality plan which complies with requirements stated in the Scope.

### **3.11 The Parties use of material provided by the *Consultant***

#### **3.11.1 *Employer's* purpose for the material**

Clause 70.1 states that the Employer has the right to use the material provided by the Consultant for the purpose stated in the Scope.

#### **3.11.2 Restrictions on the *Consultant's* use of the material for other work**

Read clause 70.4 first and if you want to restrict the Consultant's use of material provided by him for this contract on other work state these here.

#### **3.11.3 Transfer of rights if Option X 9 applies**

Not Applicable

### **3.12 Management of work done by Task Order**

Not Applicable

### **3.13 Health and safety**

Clause 25.4 states that the *Consultant* acts in accordance with the health and safety requirements stated in the Scope. It is suggested that this part of the Scope address how the *Consultant* acts when doing his services. These requirements may be no more than just complying with the law. However if the *Consultant* is required to work on Eskom premises, then whatever requirements which personnel working in those premises need to comply with should be included here or referred to in an Annexure.

If when doing his services the *Consultant* is required to carry out a design which needs to take account of certain health and safety criteria, then this should be included in the specification of that design service stated elsewhere in the Scope. A draft for this section could start as follows:

The *Consultant* shall at all times comply with the health and safety requirements prescribed by law as they may apply to the *services*. The *Consultant* shall comply with the health and safety requirements contained in Annexure SHE Specification to this Scope.

### **3.14 Procurement**

#### **3.14.1 BBBEE and preferencing scheme**

Not Applicable

#### **3.14.2 Other constraints**

Not Applicable

#### **3.14.3 Preferred subconsultants**

Not Applicable

#### **3.14.4 Subcontract documentation, and assessment of subcontract tenders**

Not Applicable

#### **3.14.5 Limitations on subcontracting**

Not Applicable

#### **3.14.6 Attendance on Subconsultants**

Not Applicable

### **3.15 Correction of Defects**

Not Applicable

### **3.16 Working on the *Employer's* property**

#### **3.16.1 *Employer's* entry and security control, permits, and site regulations**

Different Eskom Sites (Sub Stations) have very strict entrance requirements which tendering consultants need to allow for in their prices, and the *Consultant* has to comply with. State these or similar requirements here. In addition, there may be other restrictions once on the site like other Consultants/Contractors on site, work stoppage or no entrance due to other network related matters on site. This part of the Scope addresses constraints, facilities, services and rules applicable to the *Consultant* whilst he is doing work on the Employer's property.

#### **3.16.2 People restrictions, hours of work, conduct and records**

Restrictions and hours of work may apply on some sites. It is very important that the *Consultant* keeps records of his people working on the *Employer's* property. The *Employer's Agent* shall have access to these records at any time. These records may be needed when assessing compensation events.

### **3.17 Cooperating with and obtaining acceptance of Others**

This sub-paragraph could be used to deal with two issues.

- 1) The cross reference from core clause 23.1 about cooperation generally as well as details about Others with whom the *Consultant* may be required to work. See clause 11.2(7) for the definition of Others.
- 2) Requirements for liaison with and acceptance from statutory authorities or inspection agencies.



### 3.18 Things provided by the *Employer*

Not Applicable

### 3.19 Cataloguing requirements by the *Consultant*

If cataloguing is applicable, for referencing the requirements for cataloguing that need to be satisfied by the *Consultant*, Procurement Instruction Number 1 of 2018 – Incorporating Cataloguing into the Procurement Environment, Unique Identifier 240-1289988974 shall be consulted.

## 4 List of drawings

### 4.1 Drawings issued by the *Employer*

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Drawing number	Revision	Title