

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
C3.1	This cover page	
C3.2	<i>Employer's Works Information</i>	
C3.2	<i>Contractor's Works Information</i>	
	Total number of pages	

C3.1: EMPLOYER’S WORKS INFORMATION

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1 Description of the works

1.1 Executive overview

The Fossil Fuel Firing Regulations (FFFR) has a requirement that always mandate the display of essential instrumentation/process parameters to the authorised boiler operator. The basis of the FFFR is the safe operation of the boiler plant. In order to achieve this, the authorised boiler operator requires all the essential measurements to be available to him/her on the control desk on a constant basis. There can occur however a situation where all these indications are "lost" to him although the control system is in a healthy state. In this situation the control system will continue to control the unit in a fully automatic manner with the protection system able to safely trip the plant when unsafe conditions are detected.

During the HMI failure, the operator may be required to perform manual plant operations to correct some boiler process parameters hence the requirement of having an independent Essential Instrumentation Measurements display. Essential Instrumentation Requirements as stated according to Fossil Fuel Firing Regulations (FFFR) requires that:

1. The design of the operator interface shall be such that the likelihood of Common Cause, Common Mode and Dependent Failures Shall prevent the loss of the display of essential instrumentation to the Authorized Boiler Operator. To achieve this requirement a sound design philosophy shall be followed using the concepts of independency, diversity, and physical separation.

1.2 Employer's objectives and purpose of the works

Currently Grootvlei Power Station does not have an installed system to mitigate this risk.

The design requirement is to mitigate the following specific risks:

1. The failure and complete loss of communication from the server-based HMI system.
2. The failure of computer HMI stations.
3. The failure of control system network equipment (network switches, network media converters
4. The loss of power to redundant systems within the communications structure from the server to the operator screens.

OVERVIEW OF THE CONCEPT FOR THE WORKS

The *Employer's* concept is shown in Figure 1 below which will be applicable to unit 1,2 and 3 only.

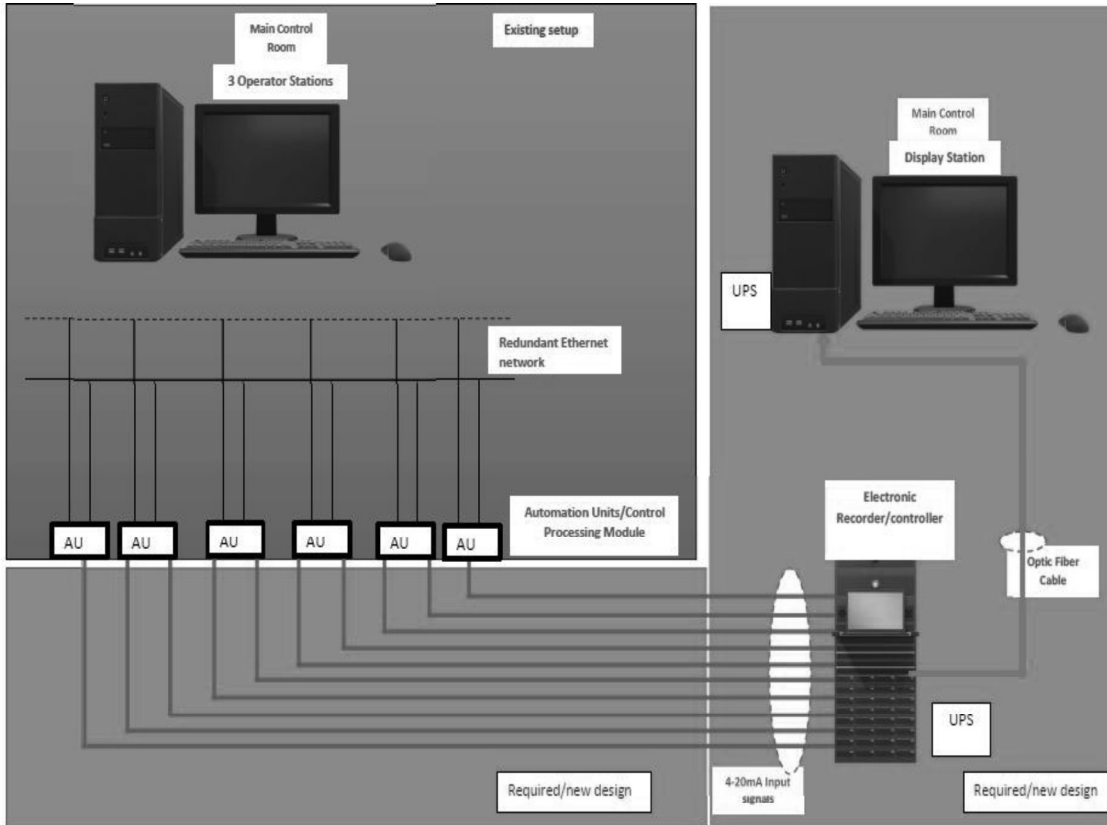


Figure 1: Required configuration

2 Work to be performed by the Contractor to Provide the Works

2.1 Clarification Phase

- a. No constraints are placed on the *Contractor* in terms of visitation rights to the Site in order to make a proper evaluation of all requirements. Systems engineering is defined as all the activities to ensure that the individual parts of the C&I as well as the C&I system together with its sub-systems, is designed and operates as an integrated and consistent system within itself and together with the rest of the plant.
- b. The system engineering activity includes the *Contractor's* site clarification at Grootvlei Power Station. The site clarification is required to determine the "as is" status and condition of the existing plant by participating with the *Employer* in establishing the new requirements referred to the "as required" for the control system.

2.2 Engineering (DESIGN PHASE)

The high-level scope of work for Provision of Essential Instrumentation Measurements Display project consist of but not limited to the following:

- a. Design loop drawings from Distributed Control System (DCS) in the unit equipment rooms to the station main control room

- b. Design, supply, routing and installation of power supply cabling to the recorder or controller and Essential Measurements Display. Even though the power is from the Uninterrupted Power Supply (UPS) Distribution Board, it's required that the recorder or controller and the essential measurement display be provided with a standalone UPS system to ensure the availability of the system.
- c. Provide design for (C&I) Control & Instrumentation system architecture network, optic fibre).
- d. Design, supply and installation of output cards (if the existing cards would not have sufficient spare channels, Eskom will conduct the assessment and make the final decision), system termination marshalling (JB), the Essential Measurements Display unit and any supporting structures required for the Essential Measurements Display unit. It is proposed to use electronic recorder or controller that would be capable of interfacing the 4-20 mA signals from the existing DCS or various industrial bus protocols (Ethernet, Modbus and Optic Fibre cable).
- e. The design shall in cooperate all the necessary equipment required for the full functioning of the Essential Instrumentation Display unit and its associated equipment.
- f. Design Input/output List from the DCS to the recorder or controller and to the station main control room. The DCS output list will be provided by the Employer however the contractor must in-cooperate it into the design loop drawings.
- g. Design system termination marshalling (rack layout drawings) for the Essential Measurements Display unit and any supporting structures required for the project.
- h. Provide cable design requirements for the signals from the DCS to the recorder/controller and the cable requirements from the recorder to the station main control room (Optic fiber cable design shall be such that there are at least 2 spare pairs available after utilising one pair for the works).
- i. Provide cable schedule Cable type and length.
- j. The contractor shall design the HMI and mapping of the signals on the display unit to allow viewing of the signals in the main control room.
- k. The selected equipment (recorder/controller) design shall be dust and waterproof.
- l. The design for the recorder/controller shall incorporate the cooling requirements for the recorder.
- m. The contractor will be required to hand over all the design documentation related to this project

2.3 EXECUTION

The *Contractor* will be required to provide the following but not limited to below mentioned equipment and services:

Supply, deliver, configure and install the recorder or controller, its mounting structure, UPS, cabling, networking components, essential measurement display units and all the components required for the complete functioning of the system. The complete system shall be fully tested and commissioned and proven to be fully functional before handover to Eskom Grootvlei Power Station.

- a. Configuration of control system output signals
- b. Configuration of the essential measurements display(s) unit
- c. Updating of the control room layout drawing
- d. Commissioning of the system and ensuring the functionality as per requirement
- e. Supply of all equipment, manuals, software packages and software licences
- f. Training of the unit operator on the use of the essential measurement display.
- g. Training of Maintenance and Engineering personnel on the use of the essential measurement display.
- h. Providing the recommended spares list and holdings
- i. Provide Bill Of Quantities and Bill Of Materials
- j. Provide all updated Engineering design drawings and documentation related to this project.
- k. Provide all operation and maintenance manuals
- l. Conduct Factory Acceptance Test, Site Acceptance Test and Site Integration Test.

2.3.1 Module Racks

All I/O modules and FTA should be mounted in the existing racks and cabinets.

2.3.2 I/O Interface to equipment and DCS

The *Contractor's* is responsible for the I/O interfacing (running of new cables) to the equipment and control system. The Employer will provide the interfacing drawing from the DCS, system loop check must be done to ensure the functioning of each loop.

2.3.3 Earthing, Lightning and Electrical protection

All metal instrument casings should be properly earthed (grounded) to the earth mat to avoid any electromagnetic interference, which may arise from portable FM transmitters, cell phones and other equipment used in the plant or equipment room. Any other means of earthing to eliminate any interference is the *Contractor's* responsibility. The *Contractor* is responsible for the correct earthing concept for reliable and safe operation of the control system.

2.3.4 Cabling

The *Contractor* is responsible for supply, installation, termination, labelling, testing and commissioning of all cables. Cable racking is provided by the *Contractor* where necessary for the completion of the works, otherwise, existing cable routes and racks are utilised by the *Contractor*. The *Contractor* is responsible to provide conduits required for the installation of their equipment. The *Contractor* provides cable in accordance with Grootvlei Power Station Cabling and Racking specification. The cabling should not be exposed to damage and must be installed in a conduit or trunking as close as possible to the physical device.

2.3.5 Power supplies.

The *Employer* provides 380/220-volts AC and 24V DC bulk supplies.

2.3.6 Plant Codification and labelling.

Codification and labelling of all equipment and documentation supplied is part of the works and is the responsibility of the *Contractor*.

Plant codification is done according to the KKS system and is in accordance with the Grootvlei Power Station Coding and Labelling Specification.

The KKS plant codes will be provided by the *Employer*, KKS codes down to third level for equipment are used on documentation (e.g. drawings, equipment lists, cable schedules etc) as a unique identification means. References to plant are accompanied by the relevant KKS code for that item of plant.

2.3.7 Commissioning

The *Contractor* is responsible for the commissioning of the overall system with the *Employers* DCS supplier in order for the full functionality of the system.

2.3.8 Completion and Handover

The documentation requirements cover the stages for installation and commissioning

The *Contractor* shall provide the documentation, in 3 sets. The documents shall be hard and soft copies and two backup CD's or USB's as part of the handover process.

2.3.9 Documentation Control

The *Contractor* implements comprehensive document control of all documents, their revision status and of the document status in relation to the 'as built' and 'as designed' plant status. Procedures, document control, flow diagrams and indexes are included in this system. The drawing register contains the following information and should be submitted in a Microsoft Excel format, to the *Project Manager*:

- a. Revision
- b. Approval status Location of drawing at that stage
- c. Drawing description
- d. Sheet number

2.4 General Requirements

The *Contractor* is responsible for providing skills mentioned in the project resource section. The contractor shall be responsible for:

- a. Attending meetings when required
- b. Staffing and management
- c. Ensure compliance with OSHAct and SANS standards
- d. Ensure compliance with Eskom policies and procedures
- e. Compliance to all legal requirements
- f. Recruitments – give first preference to qualifying candidates around Dipaleseng area
- g. Ensure that work continues with no disruptions even if an employee is off site for that particular day
- h. Ensuring that all works are quoted for as per the works information.
- i. Ensuring the system is fully operational and functional on completion of the works

The *Contractor* employees during the period they are at Eskom Grootvlei site, will start work at agreed times between the Project Manager and the Contractor. Employees to be compensated for overtime work as per the basic conditions of employment act. The *Employer* reserves a right to re-interview/re-assess employees whenever a need arises. Should an employee be found not to be performing according to expectations, the *Employer* may request the employee to be removed from site and be replaced by a suitable candidate.

2.5 Interpretation and terminology

The following definition are used in this Works Information:

DEFINITIONS

"As built"	Revised status of the plant upon completion of the work done.

The following definition are used in this Works Information:

ABBREVIATIONS

Abbreviation	Meaning
BPS	Boiler Protection System
C&I	Control and Instrumentation
DCS	Distributed Control System
FFFR	Fossil Fuel Firing Regulations
HMI	Human Machine Interface
I/O	Input/Output
JB	Junction Box

Abbreviation	Meaning
KKS	Kraftwerk-Kennzeichensystem
mA	Milliampere
OEM	Original Equipment Manufacturer
UPS	Uninterrupted Power Supply
VDU	Visual display unit
OEM	Original Equipment Manufacture
SAT	Site Acceptance Test
SIL	Safety Integrity Level
VDSS	Vendor Document Submittal Schedule
QMP	Quality Management Program
QA/QC	Quality Assurance / Quality Control

3 Management and start up.

3.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Kick off meeting	Once off after contract placement	Grootvlei Power Station or virtual	Employer, Contractor
Planning and progress meeting	Week or when the need arises	Grootvlei Power Station or virtual	Employer, Contractor and required stakeholders
Risk register meeting C.E meeting	Monthly or when the need arises	Grootvlei Power Station or virtual	Employer, Contractor
SHE statutory meeting	Monthly or when the communicated.	Grootvlei Power Station or virtual	Employer, Contractor

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information, or if not so, then specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings shall be submitted to the *Project Manager* 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 Documentation control

The *Contractor* shall provide the following documentation:

- a. Quality control plan
- b. Environmental plan
- c. Safety plan
- d. Training matrix

And all other related documents that may be required by the *Employer*..

3.3 Health and safety risk management

The *Contractor* shall adhere to all OHS Legal requirements, OHS corporate policies, standards and procedures to which Eskom subscribes and as indicated on the issued SHE specification.

The *Contractor* shall, when coming on site (Grootvlei Power Station), abide by the Eskom life saving rules. These will be provided by the *Employer* on the start of the contract.

The *Contractor* shall also abide by the Grootvlei's Safety, Health and Environmental Specifications for Contractors Procedure, which will also be provided by the *Employer*.

The *Contractor* shall, when coming on site (Grootvlei Power Station), make use of approved personal protective clothing such as overalls, safety shoes, safety hat, safety goggles, dust mask and gloves when necessary.

The *Employer* follows an accident prevention policy that includes the investigation of all accidents involving personnel and property. This is done with the intention of introducing control measures to prevent a recurrence of the same incidents. The *Contractor* is expected to fully co-operate to achieve this objective. The *Contractor* will report any incident and accidents to Grootvlei Power Station within 24 hours. This report does not relieve the *Consultant* of his legal obligation to report certain incidents to the Department of Labour, or to keep records in terms of the Occupational Health and Safety Act, and Compensation for Occupational Injuries and Diseases Act.

The *Contractor* implements a safety plan and maintains the safety system until the completion of the whole of the works. The plan, will as a minimum, contain PPE information, written safe work procedures, job specific risk assessments, safety meetings, etc. The plan will be to the *Employer's* satisfaction and will be accepted prior to the commencement of any work.

The *Contractor* will be subject to periodic audits by the *Employer* in order to ensure compliance with the plan. Any deviations will be corrected to the *Employer's* satisfaction.

The *Service Manager* has the right to stop the *Contractor's* work activities which, in the opinion of *Service Manager*, is un-safe. The *Contractor* may only continue with work activities when all safety deficiencies have been corrected to the *Service Manager's* satisfaction. The *Contractor* shall have no claim against the *Employer* in respect of delay due to the above.

3.4 Environmental constraints and management

The *Contractor* shall comply with Grootvlei Power Station environmental management system. This includes the identification, collection, storage, transportation and disposal of waste. Hazardous waste shall be disposed in line with the applicable environmental legislation. It is important to note that all spillages must be cleaned immediately and reported to the project manager as soon as possible. It is the responsibility of the polluter to clean all spillages and for the rehabilitation of the polluted land and the cost associated with that.

The *Contractor* shall comply with the environmental criteria stated in the Environmental requirements provided.

3.5 Quality assurance requirements

The *Contractor* shall adhere to all quality requirements as noted in the quality evaluation criteria document issued as part of the tender package.

The *Contractor* implements a quality system and maintains the quality system until the completion of the whole of the Works. The system, will as a minimum, comply with the provisions of the ISO9001 and the Eskom Supplier Contract Quality Requirements Specification (240-105658000)The system will be to the *Employer's* satisfaction and will be accepted prior to the commencement of any work on site.

The Contractor will be subject to periodic audits by the Employer in order to ensure compliance with the system. Any deviations will be corrected to the Employer's satisfaction.

The Service Manager has the right to stop the Contractor's work activities which, in the opinion of Service Manager, does not meet the requirements of the system and will have a detrimental effect on plant performance.

The Contractor ensures that all plant and materials for the Works are to the standard and quality accepted by the Employer and ensures that they are suitable for the purpose intended by the manufacturer.

The contractor will ensure that they facilitate effective and efficient management of incident from the moment it occurs, until it can be audited and mitigated.

3.6 Programming constraints

The *Contractor* shall submit an updated program weekly, this will be discussed in daily progress meetings.

3.7 Contractor's management, supervision and key people

Contractors Management shall be available for all meetings related to this contract whenever a need arises and they shall be available to their employees.

Requirements:

1. Engineer with BEng/ BSc or Btech in Electrical/ Electronics to approve final design, 3 - 5 years' experience
2. Supervisor/Site Manager with a National Diploma or T3 or N6 with 3 – 5 years' experience
3. Skilled labour with N4 with trade test certificate, 2 – 5 years' experience
4. Unskilled Labour, 0 – 2 years' experience
5. Working at heights training required
6. Work experience in the related field of Electrical, Control & Instrumentation or Electronic Communication including maintenance and installation is a requirement.

The *Contractor* shall ensure that all resources needed to execute this SOW are included.

3.8 Invoicing and payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager*;
- The contract number and title;
- *Contractor's* VAT registration number;
- The *Employer's* VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

Add procedures for invoice submission and payment (e. g. electronic payment instructions)

3.9 Insurance provided by the Employer

As stated for "Format A" available on

http://www.eskom.co.za/Tenders/InsurancePoliciesProcedures/Pages/EIMS_Policies_From_1_April_2014_To_31_March_2015.aspx

3.10 Contract change management

Change in scope is a compensation event. The *Employer* will be liable for any work executed without an official Purchase Order when a compensation event arises, the *Contractor* shall submit a quotation to the Project Manager for approval. Upon approval the *Contractor* shall be issued with a new Purchase Order for the additional work deviation in the works instruction. The *Contractor* shall not execute any scope without an approved purchase order, if such scope is executed, there will be no compensation by the *Employer*.

3.11 Training workshops and technology transfer

The *Contractor* shall train 10 *Employers* employees on completion of the project.

The *Contractor* shall ensure that the maintenance and or operating philosophy is handed over to the *Employer* and all the necessary training where applicable for the *Employer's* employees is completed.

All other required/ related training for *Contractor* employees shall be provided by the *Contractor*.

4 Engineering and the *Contractor's* design

Available designs will be issued to the *Contractor* and the *Contractor* shall fully update the drawings / designs on completion of the project as part of the project package.

4.1 *Employer's* design

Available designs will be issued to the *Contractor* and the *Contractor* shall fully update the drawings / designs on completion of the project as part of the project package.

4.2 Parts of the *works* which the *Contractor* is to design

The *Contractor* shall design all works required for the successful completion of this scope of work. All available drawings related to this scope will be shared with the *Contractor* to aid in successful completion these designs.

4.3 Procedure for submission and acceptance of *Contractor's* design

The *Contractor* submits all temporary works designs drawings where applicable to the Project Manager prior to execution of the temporary works. The designs must be signed by a Professionally Registered Engineer and in PDF format.

The same process shall be followed on completion of the project. The Project Manager shall communicate the milestones and updates with regards the *Employers* approval process.

4.4 Other requirements of the *Contractor's* design

All designs shall be signed off by a Professionally Registered Engineer and in PDF format.

4.5 Use of *Contractor's* design

Core clause 22.1 applies

4.6 Design of Equipment

The *Contractor* shall provide designs of all equipment required for the successful completion of this scope of work.

4.7 Equipment required to be included in the *works*

The *Contractor* shall ensure that all equipment required to execute this scope is available.

Any equipment, or appliances used by the *Contractor* conforms to the applicable OHS Act safety standards and is maintained in a safe and proper working condition. The *Project Manager* has the right to stop the *Contractor* use of any equipment which, in the opinion of *Project Manager*, does not conform to the foregoing.

4.8 As-built drawings, operating manuals and maintenance schedules

The *Contractor* must handover all as built drawings for the beams replaced as per requirements of this contract. These drawings must be handed over in the following formats on an ESKOM name block, PDF and CAD DWG/DGN.

5 Procurement

5.1 People

5.1.1 Minimum requirements of people employed on the Site

The *Contractor* shall provide suitable and qualified resources and they shall employ resources around Dipaleseng Community through the local forum where they meet the requirements.

Verifications of skills and qualifications will be conducted on all Contractor Employees where need arises.

5.1.2 BBEE and preferencing scheme

BBEE requirements are specified in the Supplier Development and Localisation Target setting document provided.

5.2 Subcontracting

5.2.1 Preferred subcontractors

Where subcontracting of certain activities is required, the *Contractor* shall notify the *Employer* and an agreement shall be obtained with the *Employer* to ensure compliance. Refer to the Supplier Development and Localisation Target Setting document

5.2.2 Subcontract documentation, and assessment of subcontract tenders

Subcontractors shall comply with all Eskom & all legal requirements and standards, and they remain the responsibility of the main *Contractor* and they shall be aligned to the Main *Contractor*. They shall adhere to Eskom ethics code.

5.2.3 Limitations on subcontracting

Where the *Contractor* encounters scenarios where specialised work is required, subcontracting of such services is to be obtained in agreement with the *Employer*. Refer to the Supplier Development and Localisation Target Setting document.

5.2.4 Attendance on subcontractors

Subcontractors shall remain the responsibility of the main *Contractor*. They shall adhere to the Employers code of ethics and comply with all the Employers requirements.

5.3 Plant and Materials

5.3.1 Quality

The Contractor shall work according to the standards and specification as prescribed in the works information.

5.3.2 Plant & Materials provided “free issue” by the *Employer*

All plant and material shall be provided by the *Contractor*. Where the scaffolding is required, the *Employer* shall provide.

5.3.3 *Contractor's* procurement of Plant and Materials

The *Contractor* procures and stores all materials as per the recommendations stipulated in the materials data sheet.

5.3.4 Spares and consumables

The Contractor shall provide required spares and consumables that may be needed at or just after take over to ensure continuity.

5.4 Tests and inspections before delivery

The Contractor shall test, inspect and ensure that the system is reliable and safe to use. Refer to clause 40 & 41.

The Contractor shall provide test/inspection certificates of the related equipment.

5.5 Marking Plant and Materials outside the Working Areas

All equipment shall be properly marked for identification.

5.6 *Contractor's* Equipment (including temporary works).

The *Contractor* shall use inspected and tested equipment, equipment compliance documents shall be made available on request by the *Employer*.

6 Construction

6.1 Temporary works, Site services & construction constraints

6.1.1 *Employer's* Site entry and security control, permits, and Site regulations

The *Contractor* makes his/her own assessment of, and allows in his/her rates for those access problems that may be encountered. No extra payment or claim of any kind is allowed on account of difficulties of access to the works, or for the requirement of working adjacent to or in the same area as others.

Access to site shall be in line with the Grootvlei Power Station's access procedure. The *Contractor* shall be required to make an application to enter site for the duration of the contract, including the warranty and defect period where applicable. A permit shall only be issued once the *Contractor* and his or her employees have attended the safety induction and has undergone medical checks.

All the assets must be declared and registered with security upon entering site. This includes portable assets such as laptops. The record must be kept on the OV18 form. No asset shall be removed from site if the OV18 form is not attached.

The *Contractor* shall have no claim against the *Employer* in respect of delay at the security main gate.

All *Contractor* permits shall be returned to Protective Services on completion of the works.

The *Contractor* shall adhere to site access control requirements; all *Contractor* employees including sub-*Contractors* shall undergo medical screening and be declared fit to work.

The *Employer* will provide induction to all *Contractor* employees and sub-contractors before the *Contractor* can start working, the *Contractor* shall have a safety file approved by the Employer and then all employees shall be issued with site access permits.

6.1.2 Restrictions to access on Site, roads, walkways and barricades

Note that the speed limit on the site is 40 km/h and 10 km/h in the plant. The vehicle permit of any persons contravening any traffic act on site shall be cancelled.

The *Contractor* complies with the Grootvlei Site Regulations, a copy of which is available for perusal at the *Employers* offices.

Any subject within the authority of the *Employer* may be addressed by a Site Regulation. Before work starts on site, an inaugural meeting is held with the *Contractor* and the *Employer* to explain all requirements of the Site Regulations.

The *Contractor* is issued with a file of current Site Regulations on arrival. The file remains the property of the *Employer* and the *Contractor* is responsible for its maintenance and updating as revised regulations are issued by the *Employer*.

6.1.3 People restrictions on Site; hours of work, conduct and records

The Contractor records information of all those that enter the *Employers* site on each site. This information is to be presented to the *Employer* on the day of the site visit.

Working hours at Grootvlei Power Station are as follows:

Monday – Thursday : 07:15 to 16:30

Friday : 07:15 to 12:15

Saturday, Sunday and Public Holidays : Off

6.1.4 Health and safety facilities on Site

The Contractor shall comply with Health and Safety requirements, Refer to the SHE spec provided.

The *Employer* and the *Contractor* shall provide services and other things as stated in the works Information. Any cost incurred by the *Employer* as a result of the *Contractor* not providing the services and other things which he is to provide is assessed by the *Project Manager* and paid by the *Contractor*.

6.1.5 Title to materials from demolition and excavation

The default position is the Contractor has no such title.

6.1.6 Cooperating with and obtaining acceptance of Others

The *Contractor* co-operates with others in obtaining and providing information and access which they need in connection with works. Refer to clause 25.

6.1.7 Publicity and progress photographs

The *Contractor* shall not share the *Employers* plant photographs or any other information without prior approval by the *Employer*. Such conduct is regarded as a deviation and there will be legal actions taken against the *Contractor*. The *Contractor* shall seek approval before taking any photographs on the *Employers* site or of any other information concerning this project.

6.1.8 Contractor's Equipment

Any equipment, or appliances, used by the *Contractor* conforms to the applicable OHS Act safety standards and is maintained in a safe and proper working condition. The *Project Manager* has the right to stop the *Contractor* use of any equipment which, in the opinion of *Project Manager*, does not conform to the foregoing.

Off-loading and material handling equipment is not available on site and if required, is to be provided by the *Contractor*.

The contractor shall declare all equipment/tools on arrival to security and keep a record at all times.

6.1.9 Equipment provided by the Employer

Scaffolding will be provided by the Employer, the Contractor shall notify the Employer of a need for scaffolding at least 12 hours prior.

6.1.10 Site services and facilities

The *Employer* shall provide services such as water, electricity and the Contractor shall provide everything else necessary for providing the works. Refer to clause 25.2 in ECC3.

6.1.11 Facilities provided by the Contractor

At his own cost, the *Contractor* provides his/her own accommodation and transport for all his/her employees engaged in the execution of the works. This includes the needs of his/her sub-*Contractors*. No accommodation is available at Grootvlei Power Station. The *Contractor* shall provide his/her own office equipment, storage, vehicles and all these shall be declared on site entry. Any un- roadworthy vehicles will not be allowed in the *Employers* premises.

6.1.12 Existing premises, inspection of adjoining properties and checking work of Others

The *Contractor* is required to inspect and scan the work area prior to the commencement of works to ensure that no underground services are damage when excavating and all the Others that maybe affected shall be notified by the *Contractor* through the Project Manager. The *Contractor* shall notify the Project Manager before any excavation work can commence.

6.1.13 Survey control and setting out of the works

The *Contractor* shall do thorough assessments to ensure the area is safe to work on.

6.1.14 Excavations and associated water control

The *Contractor* is required to inspect and scan the work area prior to the commencement of works to ensure that no underground services are damaged when excavating. The *Employer* will support the *Contractor* in assessing the area to be excavated and issue an excavation permit when all requirements after inspections and scanning by the *Contractor* are met.

6.1.15 Underground services, other existing services, cable and pipe trenches and covers

The following drawings are provided by the Employer:

- 0.19/11001
- 0.19/11002
- 0.19/11003Rev2
- 0.19/11004Rev1
- 0.19/11005
- 0.19/1164Rev1

The Contractor shall provide his own detection equipment for locating underground services. Damage to known and unknown services will be at the Contractors cost; therefore the contractor shall make sure the area is effectively detected and declared clear of services. If there is damage to the Employers services, the Employer will assess the extent of damage and formally communicate penalties applicable.

6.1.16 Control of noise, dust, water and waste

The Contractor shall manage waste accordingly and always use appropriate Personal Protective Equipment.

6.1.17 Sequences of construction or installation

The Contractor shall follow to the construction program sequence, if there are changes (where access should be given to Others or for any other valid reason), this should be communicated to the Project Manager and the Project Manager shall approve before the sequence can be changed.

6.1.18 Giving notice of work to be covered up

Where applicable, on completion of the activity that involved excavation or any other activity, the Contractor shall notify the Employer to conduct inspections as prescribed in the QCP; the Employer shall give the Contractor a go ahead to backfill provided the activity is done according to the specified requirements.

6.1.19 Hook ups to existing works

The Contractor shall notify the Employer of any activities that requires hooking up, before any structure can be used for hooking up the Employer shall declare such structure safe for hooking up.

6.2 Completion, testing, commissioning and correction of Defects

6.2.1 Work to be done by the Completion Date

On or before the Completion Date the Contractor shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The Project Manager cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the Employer from using the works and Others from doing their work.

	Item of work	To be completed by
	As built drawings of the whole system	Within 7 days after Completion
	Performance testing of the works in use as specified in 1.3 of this Works Information.	See performance testing requirements.

6.2.2 Materials facilities and samples for tests and inspections

The Contractor shall use any facilities as he sees fit and reliable for tests and inspection. He shall ensure that they are safe to be used.

6.2.3 Commissioning

Commissioning shall be done after completion and the *Contractor* shall ensure the system is working fully.

6.2.4 Start-up procedures required to put the *works* into operation

The *Contractor* shall ensure the *Employer* is notified for start-up to observe the process and all legal and the *Employers* applicable standards shall be adhered to.

6.2.5 Take over procedures

On completion of the whole works, the *Employer* shall take over the plant. The *Contractor* ensures that the plant is in a good condition and all defects are noted for correction within the contract stipulated duration where applicable.

6.2.6 Access given by the *Employer* for correction of Defects

The *Employer* shall arrange access for the *Contractor* where a notice for defects is raised; the *Contractor* shall follow the process of gaining entry and the *Employer* ensures that the plant is available for the *Contractor*.

6.2.7 Training and technology transfer

The *Contractor* shall train 10 *Employer* employees on completion.
The *Contractor* shall provide the Maintenance / operating philosophy and the drawing/ designs.

7 Plant and Materials standards and workmanship

7.1 Electrical & mechanical engineering works

All works to be done in accordance to the scope of work document which details the entire scope at hand with all the technical specifications for the works.

7.2 Process control and IT works

All works to be done in accordance to the scope of work document which details the entire scope at hand with all the technical specifications for the works.

8 List of drawings

8.1 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. Drawings included in the works information.

Note: Some drawings may contain both Works Information and Site Information.

Drawing number	Revision	Title
HBSESG-2010_05_06/1	2	DVM System Architecture
0.19/24795	2	Grootvlei Power Station Overall Layout Security Installation
0.19/24900	0	Grootvlei Power Station Control Room Layout
0.19/24880	0	Grootvlei Power Station SA Fence and Gate Main Entrance Layout
0.19/24793	4	Grootvlei Power Station Vaal Dam Installation Layout

0.19/24904 (1/2)	0	Vaal Dam High Lift Security C&I Installation
0.19/24904 (2/2)	0	Vaal Dam Security Intake C&I Installation
0.19/24903	0	Telematick Link
0.19/24905 (1)	0	Grootvlei Power Station High Site Detailed Layout Security Installation

PART 4: SITE INFORMATION

Site	:	Grootvlei Power Station
Regional Authority	:	Dipaliseng Town Council, Mpumalanga Province
Nearest Towns	:	Balfour – 18km north east of power station Villiers – 30km south of power station Heidelberg – 40km north of power station There are informal settlements within a 10 km radius of the power station.
Infrastructure	:	Grootvlei Power Station is situated approximately 3km from the N3 highway and is connected to it by means of a tarred road. There is also a secondary tarred road connecting the site with the R51 and R53. Water is supplied to the adjoining township, and sewage is returned to the sewerage <i>Works</i> of the power station. The railway line from Balfour to Bethlehem passes the station. 400kV and 88kV power lines cross the existing road network in the area.
Latitude & longitude	:	26° 46' S & 28° 29' E
Landowner	:	The power station is situated on the farm Grootvlei Power Station, ERF 458 IR, Title deed number CCT50784/1983. Eskom is the landowner.
River catchment	:	Mid-Vaal
Regional Climate	:	Grootvlei Power Station is situated on the Highveld in the western part of Mpumalanga province on the escarpment, at an average height of 1551 m above sea level. The winters are generally dry and cold with regular frost and temperatures varying between -7°C and 23°C. The summers are mild with most of the rainfall occurring during this season. Temperatures vary between 12° & 32° C.
Wind direction	:	Data from the Heidelberg weather station shows that Grootvlei Power Station is sited in such a way that for most of the year (291 days) the wind direction is from the power station in a direction that is North West.

Rainfall

Based on information recorded at the Heidelberg weather station, the average annual rainfall for the Heidelberg area is approximately 691 mm. (Weather Bureau, Pretoria).

C3.2 CONTRACTOR'S WORKS INFORMATION

This section of the Works Information will always be contract specific depending on the nature of the *works*. It is most likely to be required for design and construct contracts where the tendering contractor will have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical sub headings could be

- a) *Contractor's* design
- b) Plant and Materials specifications and schedules
- c) Other

This section could also be compiled as a separate file.
