

Appendix C: Documentation Requirements

1 General

- a) The *Contractor* composes and submits all documents required throughout the project including the information listed in this document.
- b) All Documentation to be written in English.
- c) All Documentation is produced in accordance with the Eskom Supplier Contract Requirements Specification QM-58 section 3.13 at all stages throughout the project life.
- d) Metric/SI units to be used throughout the Contractors' Documentation.
- e) The *Contractor* submits the Documentation in a timely manner to avoid peaks in information flow as described in this document.
- f) The *Contractor* provides a document referencing system for version control and Quality Assurance purposes.
- g) The *Contractor* ensures that the 'originator' and 'approver' have signed each of the Contractors' Documents before submission to confirm that the work:
 - a. complies with the Work Information Document
 - b. has been checked and date noted
 - c. does not contain any unauthorised changes under the Contract.
- h) Consistent symbols, legends, equipment references, and terminology to be used in the *Contractors'* Documentation in line with appropriate standards.
- i) The *Contractor* clearly annotates, describes and dates each revision to the *Contractors'* Documents after initial submission. Revisions to be marked sequentially.
- j) The *Contractor* retains a dated record copy of revisions to the *Contractors'* Documents. Archived copies of the Documentation to be resubmitted when requested by the Employer's *Project Manager*.
- k) The *Contractor* submits the minimum documents at different project phases according to requirements described in this document. The submitted documents will be reviewed either for Information purpose (represented by "I") and/or for Employer's Acceptance purpose (represented by "A").
- l) The *Contractor* is required to provide complete set of documents in each phase even though the part or complete documents required in later phase has already been provided during earlier phase.
- m) The list of documented described in these sections are minimum. The *Employer* may request additional information related to project, which the *Contractor* shall provide to *Employer*.

- n) Any or all of the *Contractors'* Documents may be reviewed by the *Employer's* Project Manager to verify compliance with the Works Information Document and accordance with the Design Intent.
- o) All *Contractors'* Documents selected for review will be given a status mark as shown in the table below

| STATUS MARK | REVIEW COMMENT | MEANING |
|-------------|-------------------|--|
| 'A' | No comment | The Contractor may proceed. |
| 'B' | Comments as noted | The Contractor may proceed at their own risk, incorporating the comments in a timely manner, and resubmit. |
| 'C' | Re-submit before | The Contractor must resubmit before proceeding. |

- a) Any incomplete or substandard submissions will automatically be given 'C' status
- b) The *Contractor* allows a period of minimum 5 working days to the *Employer's Project Manager* to review and comment on the *Contractors'* submitted Documents. *Employer's Project Manager* has own team of engineers, contract experts, finance experts to support on reviewing *Contractor's* submitted documents.
- c) Comments given by the *Employer's Project Manager* do not relieve the *Contractor* of their responsibilities and obligations regarding the execution of the works and compliance with the Contract Documentation and the Works Information. Comments given by *the Employer's Project Manager* do not constitute a Change under the Contract.

2 Tender Phase

- a) The *Tenderer* submits all documents necessary for a full understanding of the Basic design details and compliance to the Works for the Plants as described in **Appendix E**: Tender Technical Schedule A&B of the Works Information. All tables are filled in by the *Tenderer*.
- b) The *Tenderer* ensures the submission is completed according to Works Information.

3 Design Phase

- a) The *Contractor* submits all design documents and drawings in compliance with information presented during tender application, work information and contract requirement.
- b) All design, equipment, materials, fabrication and tests conform to the latest applicable standards indicated in this Contract
- c) All design and equipment are entirely suitable for the use under the site conditions.
- d) The design of plant complies with the site permit and safety requirements .
- e) The *Contractor* provides design documents and drawings in following time manner to ensure the finalization of design within agreed timelines.

| No. | Document / Drawing | Review Type |
|--|--|-------------|
| Project Management Document: Within 1 week after issue of Contract Date | | |
| 1 | Project schedule with minimum level 3 activities | A |
| 2 | Design and Drawing list (schedule) with submission dates | A |
| 3 | Project Quality Plan, Environment and Waste Management Plan | A |
| 4. | Project Organogram showing project team members | A |
| 5 | Risk register and mitigation proposal (design, construction and operation and maintenance) | I/A |
| | | |
| Plant Detail Design: Within 2 weeks after issue of Contract Date | | |
| 1 | Kriel Site Layout: PV Plant Site Layout showing details on module orientation, total PV footprint, installation location of Inverters, DC-DB, AC-DB, AC Sub-DB, Ext-DB | A |
| 2 | Admin Site Layout: PV/BESS Plant Site Layout showing details on module orientation, total PV footprint, installation location of BESS, DC-DB, AC-DB, AC Sub-DB, Switching Station | A |
| 3 | Civil Design: Carport Structure drawings and report <ul style="list-style-type: none"> Kriel PV Carport Structure Drawings showing dimensions, tilt angle, materials used and foundation details. Foundation: type, layout, design and material. PV Structure analysis report signed by Professional Civil Engineer. | A |

| No. | Document / Drawing | Review Type |
|-----|--|-------------|
| | <ul style="list-style-type: none"> Admin PV Carport Structure Drawings showing dimensions, tilt angle, materials used and foundation details. Foundation: type, layout, design and material. PV Structure analysis report signed by Professional Civil Engineer. | |
| 4 | Kriel PV Plant Single Line Diagrams (SLDs) <ul style="list-style-type: none"> Main SLD showing PV Modules, DC-DB, Inverters, AC Isolators, AC-DB and PoC Ext DB, earthing, cable sizes, protection devices rating, , control and monitoring system, energy meters, anti-islanding and weather station. Detailed SLD showing PV Modules, DC-DB, Inverters, AC Isolators and AC-DB. Updated SLD for Finesse Minisub to include PV and EV charger CBs (per Appendix A of Technical specification) Auxiliary power supply SLD from AC-DB for lighting and Sub-DB | A |
| 5 | Admin PV Plant Single Line Diagrams (SLDs) <ul style="list-style-type: none"> Main SLD showing PV Modules, DC-DB, BESS Inverters and Batteries, PoC Switching station for Board A and Board B, AC-DB, earthing, cable sizes, protection devices rating, Auxiliary power supply from AC-DB for lightning and Sub-DB, control and monitoring system, energy meters and weather station. Detailed SLD showing PV Modules, DC-DB, BESS Inverters, Batteries, protection. Updated SLD for Admin Board A and Board B to include Grid and Diesel Generator CBs (as per Appendix B of Technical specification) Auxiliary power supply SLD for BESS container loads including HVAC, FDS, CMS, etc. | A |
| 6 | PV String layout drawing for Kriel and Admin PV Plants | A |
| 7 | String voltage and MPPT calculations for Kriel and Admin PV Plants | A |
| 8 | Cable routing layout drawings: <ul style="list-style-type: none"> Kriel PV: DC and AC Cable routing layout drawing to POC and Sub-DB Admin PV: DC and AC Cable routing layout drawing to POC and AC-DB | A |
| 9 | Cable schedules <ul style="list-style-type: none"> Kriel PV and Admin PV: DC cables schedules with size, length, voltage drop, type of cable, rating, location (from-to) and Tags Kriel PV and Admin PV: AC cables schedules with size, length, voltage drop, type of cable, rating, location (from-to) and Tags . | A |
| 10 | Protection, Earthing and Lightning systems - calculation and drawings | A |
| 11 | Full Electrical Balance of System Data Sheets and Specifications (e. g. cables, switches, protection devices, isolators etc.) . | A |

| No. | Document / Drawing | Review Type |
|-----|---|-------------|
| 12 | Lighting systems according to works information Construction method | A |
| 13 | CMS System: <ul style="list-style-type: none"> Comprehensive CMS design report (Operating and engineering description, logic diagrams and formulas used to calculate data, HMI mimics, graphical user interface screen dumps, data analysis and information storage description, operations and troubleshooting, etc.) Detailed CMS network single line diagram of the complete CMS works Detailed field wiring schematics Site specific equipment locations and cable route diagrams Instrument and equipment list Cable schedule and cable specifications (power and communication) CMS signal list All instrument and equipment datasheets, manuals, specifications CMS load list (Power supply and distribution SLD including design calculations, battery sizing, etc.) Software relevant to CMS system | A |
| 14 | Detailed Construction method including no. of employees working on site, site establishment, employee management: how employees will be accommodated and transported to site, sanitation services, waste management | I/A |
| 15 | Site survey report (Geotechnical Assessment report) | A |
| 16 | General Arrangement of Plant equipment | I |
| | Technical Datasheets, User Manuals, Certificates for: <ul style="list-style-type: none"> PV Modules String Inverters and Hybrid inverter Battery and DC Cabinet Battery container equipment (HVAC, FDS, etc.) DC and AC Cables and Cable connectors Meteorological system / Weather Stations equipment CMS equipment and datalogger DC Combiner boxes Circuit Breakers and Fuses Mounting Structure Distribution boards | A |

| No. | Document / Drawing | Review Type |
|---|---|-------------|
| 17 | Manufacturer's Drawings for main plant items | A |
| 18 | Training schedule according to Works Information | A |
| 19 | Test and commissioning protocols (including test types, evaluation method, acceptance criteria) and schedules of minimum followings according to Works Information: Factory Acceptance Test Site Acceptance Test Mechanical Completion Test Electrical Completion Test Substantial Completion Test | A |
| 20 | PV Plant energy yield and performance estimation report – Simulation results, monthly breakdown of results. System loss calculation | A |
| 21 | Electrical Wiring diagram of the whole plant and equipment | |
| 22 | List of Auxiliary consumption | A |
| 23 | List of standards followed for design, design calculation report | A |
| 24 | NRS-097-2-1:2010 compliance for the inverter proposed | |
| 25 | List of spare parts list, tools of operation and maintenance | A |
| 26 | Any other relevant documents, identified by the Contractor | I/A |
| 27 | Bill of quantities or materials | I/A |
| Within 30 calendar days after issue Contract Date | | |
| 28 | Freeze complete final design of the plant covering all items listed from No 6 – 27 above | A |

- f) The *Contractor* lists all drawings submitted with Design Documents. Additional sheets to be attached if necessary:

3.1 Procurement Phase

- a) The *Contractor* starts procurement process of PV plant components during early design phase.

- b) The *Contractor* provides minimum, but not limited to, following documents related to procurement of PV plant components.

| No. | Document / Drawing | Review Type |
|---|---|-------------|
| Within 1 weeks after issue of Contract Date | | |
| 1 | List of product type and manufacturer that the Contractor is intending to consider for the Project: <ul style="list-style-type: none"> - PV Module - Inverter - Combiner box - BESS (Battery, hybrid inverter, container - Switchgear (AC DBs) - Meters and Relays - DC cabling - AC cabling - Communication cable - C&I System - Security Components - Meteorological System/ Weather Stations | I/A |
| 2 | Expected Procurement Schedule for all components | I |
| Within 1 week after the Placement of Purchase Order | | |
| 3 | Proof of purchase order for all PV components (minimum for components listed above in tem no. 1) | I |
| 4 | Technical specification of all components (minimum listed above in item no. 1) in compliance to Works Information | A |
| 5 | Warranty documents including terms and conditions for all components (minimum listed above in item no. 1) in Compliance to Works Information | A |
| 6 | Relevant Certificates for all components including calibration certificates of equipment in weather stations (minimum listed above in item no. 1) in compliance to Works Information | A |
| Within 1 week before the Factory Acceptance Test | | |
| 7 | Test schedules – date of commencement of each test type | I |
| 8 | Test Protocols in accordance with Works Information including minimum of followings but not limited to: <ul style="list-style-type: none"> - detail description of inspection test types | A |

| No. | Document / Drawing | Review Type |
|---|---|-------------|
| | <ul style="list-style-type: none"> - components certificates, technical data sheets - manufacturers' quality certificates - Components to be used during test/inspections - standards to be followed during tests/inspections - acceptance and rejection criteria of each test - Test results from previous inspections/tests, if available | |
| 9 | For PV modules <ul style="list-style-type: none"> - Flash Test Data Sheet from manufacturer for all PV modules to be delivered on site in compliance to Works Information - Independent Laboratory Test location for counter test including ISO/IEC 17025 certificate according to Works Information | A |
| Within 1 week after Factory Acceptance Test | | |
| 10 | Factory Acceptance and Independent laboratory Test Report including minimum followings (item no 11 – 14) | A |
| 11 | Agreed test protocols according to requirement mentioned under item no: 08 | I |
| 12 | Data during test/inspection and test evaluation results | A |
| 13 | Summary and conclusion in regard to acceptance or rejection of test of components | A |
| 14 | Delivery date to site of plant components | I |
| Within 1 week after the delivery of components on site (Site Acceptance Test) | | |
| 15 | A complete set/package of documents including following items no: 15 - 21 | I |
| 16 | Technical Specification of components delivered to the site | I |
| 17 | Relevant standards of components delivered to the site according to Works Information | I |
| 18 | Warranty documents including warranty terms and conditions for components delivered to the site | I |
| 19 | Factory Acceptance Test and Independent Laboratory test results listed on item no 10 – 13 above. Manufacturer's Type Test Certificates | I |
| 20 | Installation and operation manual for components delivered to the site | I |
| 21 | Site Acceptance test results | A |

4 Site Establishment and Construction Phase

- a) The Contractor delivers following documents in accordance to Works Information during site establishment and construction phase.

| No. | Document / Drawing | Review Type |
|---|--|-------------|
| Within 1 week before the site establishment | | |
| 1 | Project Construction schedule | A |
| 2 | Construction Method, Quality Plan, environment and waste management plant | A |
| 3 | Proof of compliance to Eskom SHEQ and quality requirements | I |
| Within 1 week before the start of construction | | |
| 4 | Site Infrastructure Construction Proposals | A |
| 5 | Method statements for transportation, delivery and storage of all tools, parts and equipment. Method Statement for Site Management Procedures. Method Statement for Site and Access Arrangements for Construction Purposes. Method statement for site preparation and preconstruction works. Method statement for construction and assembly of PV and BESS systems. Method statement for pre-commissioning | A |
| 6 | Method statement for electrical network connection works. Method statement for civil engineering works | |
| Bi-weekly reporting during construction after the start of site establishment (reports submission within 1 week after each reporting period; a calendar month has 2 reporting periods each on 15 days interval) | | |
| 7 | Bi- weekly progress reports including items no: 8 – 19, as minimum | I/A |
| 8 | Introduction and summary | I |
| 9 | Status of construction progress | I |
| 10 | Status of construction milestone including shipping and delivery dates of major PV plant components (minimum list of equipment presented under procurement phase section) | I |
| 11 | Site employment report including details of staffing of <ul style="list-style-type: none"> - Construction contractors at the site, - Contractor's engineering service support team - Subcontractors (if any) at the site - No. of workers on site | I |
| 12 | Health and Safety report | I/A |

| No. | Document / Drawing | Review Type |
|--|--|-------------|
| 13 | Status of permitting, authorization and any approvals | A |
| 14 | Construction progress S curve | I |
| 15 | Critical actions to be covered during next 2 weeks period | I |
| 16 | Project schedule | A |
| 17 | Photographs of construction progress | I |
| 18 | Any other items that the contractor wish to include in the report upon discussion with Employer. | I |
| Within one week after the test during construction | | |
| 19 | Concrete test report for 7 days, 28 days | A |

5 Test After Installation

- a) The Contractor complies with all tests after installation requirements set in Works Information.

5.1 Mechanical Completion

- a) The *Contractor* provides following minimum documents, but not limited on different timely manners before, during and after Mechanical Completion.

| No. | Document / Drawing | Review Type |
|---|---|-------------|
| Within 2 weeks before the Mechanical Completion | | |
| 1 | Training material for construction and commissioning of plant according to requirement set in Works Information. The training material shall be minimum of followings item no. 2 -10 but not limited to: | A |
| 2 | Plant description, design process, calculation and results (e.g. Cable sizing, cable route, cable loss, module-inverter configuration, MV switchgear design, PV plant substation design, transmission line design, civil infrastructure design, security design and etc.) | A |
| 3 | Construction and installation method of all major PV plant components including HVAC system, fire protection system and sewage system | A |
| 4 | Safety during construction and commissioning | A |
| 5 | Introduction to test types, measurement methods and test equipment for inspection, tests and commissioning | A |
| 6 | Test evaluation method and result interpretation | A |
| 7 | Trouble shooting procedure | A |
| 8 | A checklist on what to do in case of system failure (at different plant level e.g. Fault in connection point, PV plant substation, MV cabin, Combiner boxes, Junction boxes) | A |
| 9 | Emergency shutdown/ isolation procedure | A |
| 10 | Reporting during construction and commissioning | A |
| 11 | Proof of completion of Training to Employer and the Employer's representative according to requirement set on "Training during construction and Commissioning" under Works Information | A |
| 12 | Test after installation schedules – Mechanical Completion Test and Electrical Completion Test | I |

| No. | Document / Drawing | Review Type |
|-----|--|-------------|
| 13 | Project complete As built design and documents which shall include minimum as followings items no 14 – 30 | A |
| 14 | Project summary and design description report | A |
| 15 | System designers' information (name, affiliate, contact details) | I |
| 16 | System installer/Contractor's information (name, affiliate, contact details) | I |
| 17 | Detailed single line diagram of DC, AC system including connection and wiring diagrams for array DC boxes, inverters, BESS, AC DB | A |
| 18 | C&I system network diagram, component list and technical specifications | A |
| 19 | List of alarm, signals | A |
| 20 | Specification of PV array <ul style="list-style-type: none"> - Module type - Tracking of module serial numbers - No of modules per string - Number of strings per combiner boxes and per inverter | A |
| 21 | Cabling information <ul style="list-style-type: none"> - DC Cable: cable type, size, length and expected losses calculation - AC Cable: cable type, size, length and expected energy losses calculation - Specification (current and voltage ratings) of all protection devices used in DC and AC system - Cable schedules | A |
| 22 | Electrical characteristics of Array <ul style="list-style-type: none"> - Array junction box location, number and tracking - Array main cable specification - Location and type and rating of over voltage protection devices | A |
| 23 | Earthing and over voltage protections including a single line diagram showing details of all earthing, lightning protection systems and details of surge protection devices. Lighting SLDs | A |
| 24 | A single line diagram showing DC and AC isolators location, type, rating along with similar information for AC over current protection devices | A |
| 25 | Technical data sheet, relevant certificates and warranty documents of all components | A |

| No. | Document / Drawing | Review Type |
|---|---|-------------|
| 26 | PV array layout, total footprint used during construction, physical location of all civil infrastructures including O&M building, PV plant substation, roads, drainage system etc. | A |
| 27 | Verification on approval of all permits/approvals for construction and operation of Project | A |
| 28 | Complete C&I design, network diagram, test certificates and test results (according to section 3.4.19 of Works Information) | A |
| 29 | Complete security system design | A |
| 30 | Updates on Final design listed under design phase above, if any made during the construction. If not updates, the Contractor shall still submit the complete package of final design. | A |
| Within 1 weeks before the start of Mechanical Completion Test | | |
| 31 | Detail test protocol for mechanical completion test according to requirements set in Works Information | A |
| 32 | Information Mechanical Completion Test – Commencement date | I |
| 33 | Project Quality Plan during complete commissioning (test after installation and test on completion) | A |
| 34 | Contractor's internal inspection report (signed by the Contractor's Site Manager) which verifies the compliance of the physical installation works with the design and the Works Information. | A |
| 35 | Punch list items- if any according to the Works Information | A |
| Within 1 week after the Mechanical Completion Test | | |
| 36 | Final Mechanical Completion test report signed by the Contractor and Accepted by the Project Manager | A |
| 37 | Final Punch List signed by the Contractor and Accepted by the Project Manager | A |

5.2 Electrical Completion Test

- The Electrical Completion Test is performed according to IEC 62446, IEC 60364-6, SA Grid code for renewables and current best practice in PV industry.
- The Contractor provides following documents in timely manner in order to execute electrical completion test according to requirements set in Works Information.

| No. | Document / Drawing | Review Type |
|---|--|-------------|
| Within 3 weeks before the start of Electrical Completion Test | | |
| 1 | Test Protocols in accordance with requirement in Works Information, with minimum following requirements (item no 2 – 6) | A |
| 2 | Definition of each test type and detailed testing methods | A |
| 3 | List of equipment to be used for each test type and their technical specification, measurement uncertainties and relevant certificates (e.g. Calibration certificates) | A |
| 4 | Test evaluation method (including equations-whenever applicable) | A |
| 5 | Acceptance/Rejection criteria for each test type | A |
| 6 | Safety to be considered during the test | A |
| 7 | Test schedule for each test types including grid connection test | A |
| Within 1 week before the start of Electrical Completion Test | | |
| 11 | Final Test protocols and test schedules mentioned in item no 1 – 7 above. | A |
| 12 | Proof of Mechanical Acceptance Test Certificate, accepted by the Employer's Project Manager | I |
| Within 1 weeks after completion of Electrical Completion Test | | |
| 13 | Electrical completion test report (to be signed by the Contractor) including followings (item no 13 – 19) | A |
| 14 | Final Test Protocol | A |
| 15 | Raw data (unprocessed) or measured data for each test type on site | A |
| 16 | Evaluation of Raw data (processed data) according to Final Test protocol | A |
| 17 | Final results indicating the acceptance or rejection of each test types | A |
| 18 | Grid connection test report and results | A |
| 19 | Certificate of Compliance (CoC) according to Works Information which verifies the Project compliance to SA grid code for Renewables | A |

6 Test On Completion

- a) The *Contractor* performs the test on completion according to all requirements set in Works Information.
- b) Test on Completion refers to the “Provisional Acceptance Test (PAT)” which verifies both performance ratio and availability of the plant against the *Contractor’s* guarantee.
- c) The *Contractor* provides following documents in timely manner in order to execute tests on completion according to requirements set in Works Information.

| No. | Document / Drawing | Review Type |
|--|---|-------------|
| Within 4 weeks before the start of Provisional Acceptance Test | | |
| 1 | Project Operation and Maintenance (O&M) Manual in compliance to project requirement and Works information. The manual includes the followings (item no 2 – 12) as minimum but not limited to; | A |
| 2 | Procedures for verifying correct system operation (Start-up / Shut down of PV and BESS Plants , HMI operation, Single line diagram, Regular Maintenance on Modules, Inverter first line maintenance, Batteries, switchgear, ups, etc.); | A |
| 3 | Safety Guidelines including emergency shutdown/isolation procedures | A |
| 4 | Preventive and corrective maintenance procedures including site inspection checklist for each component including power evacuation line and security systems | A |
| 5 | Scheduling of routine maintenance | A |
| 6 | A checklist of what to do in case of system failure | A |
| 7 | Documentation on stock of spare parts and spare parts management including contact information and procedures for replacement of defective components | A |
| 8 | Inverter, Battery O&M Manual (troubleshooting for error codes, repair, software for inverter, battery, Fault finding on the DC Plant); | A |
| 9 | Data Acquisition System and CMS O&M Manual (troubleshooting, equipment descriptions, repair, metering equipment downloading, weather station); | A |
| 10 | Method of PV module cleaning | A |
| 11 | Operation and maintenance manual for inverter, transformer and module from respective manufacturers; and | A |
| 12 | Performance monitoring and reporting procedures, templates | A |
| Within 2 Weeks before the Provisional Acceptance Test | | |

| No. | Document / Drawing | Review Type |
|--|--|-------------|
| 13 | Proof of Mechanical, Certificate of Compliance and Commissioning Certificate, accepted by the Employer's Project Manager | I |
| 14 | Test Protocols in accordance with requirement in Works Information, with minimum following requirements (item no 3 – 7) | A |
| 15 | Performance Ratio and Plant Availability test methods including guaranteed values for Provisional Acceptance Test in compliance to Works Information | A |
| 16 | List of equipment to be used for each test type and their technical specification, measurement uncertainties and relevant certificates (e.g. Calibration certificates) | A |
| 17 | Test evaluation method including equations in accordance to Works Information | A |
| 18 | Acceptance/Rejection criteria | A |
| 19 | Safety to be considered during the test | A |
| 20 | Test schedule for each test type | A |
| Within 1 week before the start of Provisional Acceptance Test | | |
| 21 | Final Test protocols and test schedules mentioned in item no 14 – 20 above. | A |
| 22 | Proof of Mechanical and Commissioning Certificate, accepted by the Employer's Project Manager | I |
| 23 | Proof of completion of Training (Training during construction and commissioning) according to requirement in Works Information | I |
| Within 2 weeks after completion of Provisional Acceptance Test | | |
| 24 | Provisional test report (to be signed by the Contractor) including followings (item no 25 – 28) | A |
| 25 | Final Test Protocol | A |
| 26 | Raw data (un-processed) or measured data for each test (both Performance Ratio and Availability) | A |
| 27 | Evaluation of Raw data (processed data) according to Final Test protocol | A |
| 28 | Final results indicating the acceptance or rejection of each test (Performance Ratio and Availability) | A |
| 29 | Final Project Operation and Maintenance Manual | A |
| 30 | Proof of Spare Parts being available on site | A |
| 31 | Calculation of Delay Liquidated Damage according to Works Information, if any and proof of payment to the Employer | A |
| 32 | Proof of transfer of all guarantees and warranties to the Employer | A |

| No. | Document / Drawing | Review Type |
|-----|--|-------------|
| 33 | Punch List, if any pending accepted by the Employer's Project Manager and schedule for the correction | A |
| 34 | Schedule for Training on Operation and Maintenance of the Facility | A |
| 35 | Contractor's document verifying that the site is clean and free from any waste materials from construction and commissioning | A |

- d) The *Contractor* shall prepare and submit all information necessary to enable the safe and efficient Mechanical Completion and Provisional Acceptance Testing, including the items listed below.

| ITEM | REQUIRED |
|--|----------|
| Construction Executive Summary, including written description of the constructed plant and a Project | ✓ |
| Commissioning Protocol completed with Design Data | ✓ |
| Mechanical Completion Checklist | ✓ |
| Mechanical Completion Method Statement | ✓ |
| Completion Documentation | ✓ |
| Electrical Completion Checklist | ✓ |
| Electrical Completion Test Method Statement | ✓ |
| Electrical Completion Test Documentation | ✓ |
| Provisional Acceptance Checklist | ✓ |
| Provisional Acceptance Test Method Statement | ✓ |
| Provisional Acceptance Test Documentation | ✓ |
| Provisional Acceptance Test Certificate | ✓ |
| Provisional Acceptance Test Report | ✓ |
| System Handover Method Statement | ✓ |
| Bill of Materials (BOM) | ✓ |
| Indexing of any standard numbering labelling conventions used during plant construction | ✓ |
| Mapping table of component parts regarding position and traceability of such in constructed site | ✓ |
| Spare parts list | ✓ |
| Complete 'A' Status Project Drawings | ✓ |
| Complete 'A' Status O&M Manuals | ✓ |

7 Operation and Maintenance

- a) The Contractor complies with requirements on Operation and Maintenance according to Works Information.
- b) The Contractor provides following documents in timely manner during operation and maintenance period according to requirements set in Works Information

| No. | Document / Drawing | Review Type |
|--|---|-------------|
| Within 4 weeks after the issue of Substantial Completion Certificate | | |
| 1 | Training Material for "Training of Operation and Maintenance of the Project" in compliance to Works Information | A |
| 2 | Training schedule for both classroom and on-site operation and maintenance training | A |
| 3 | Project Quality Plan during operation and maintenance | A |
| Within 8 Weeks after the issue of Substantial Completion Certificate | | |
| 4 | Final Training Material for "Training of Operation and Maintenance of the Project" in compliance to Works Information | A |
| 5 | Final Training schedule for both classroom and on-site operation and maintenance training | A |
| Operation and Maintenance Report | | |
| 6 | O&M activities and O&M report according to Works Information | A |
| 7 | Daily reporting shall be provided within immediate next calendar day | A |
| 8 | Monthly reporting shall be provided within 1 weeks after the reporting month period | A |
| 9 | Annual reporting shall be provided within 1 week after the reporting annual period | A |
| Within 24 (6 months) weeks after the issue of Substantial Completion Certificate | | |
| 10 | Proof of completion of "Training on Project Operation and Maintenance", accepted by the Employer's Project Manager | A |

8 Test After Completion

- a) The *Contractor* complies with requirements on Test after completion according to Works Information.
- b) The *Contractor* provides following documents in timely manner to execute tests after completion according to requirements set in Works Information.

| No. | Document / Drawing | Review Type |
|---|--|-------------|
| Within 2 weeks after the completion of First year Performance Ratio Test and First year Plant Availability Test | | |
| 1 | Test Report in accordance to Works Information and Annual Reporting requirement in Appendix K (signed by the Contractor) | A |
| 2 | Calculation of Performance Liquidated Damage according Works Information for both Performance Ratio and Plant Availability, if any | A |
| 3 | List of Spare parts list available on Site in compliance to Works Information | A |
| Within 4 weeks after the completion of First year Performance Ratio Test and First year Plant Availability Test | | |
| 4 | Proof of Payment of Performance Liquidated Damage, if any (according to Appendix H) to the Employer | A |
| Within 3 weeks before the start of Final Acceptance Test | | |
| 5 | Test Protocols in accordance with requirement in Works Information, with minimum following requirements (item no 6 – 11) | A |
| 6 | Definition of each test type and detailed testing methods | A |
| 7 | List of equipment to be used for each test type and their technical specification, measurement uncertainties and relevant certificates (e.g. Calibration certificates) | A |
| 8 | Test evaluation method (including equations-whenever applicable) | A |
| 9 | Acceptance/Rejection criteria for each test type | A |
| 10 | Safety to be considered during the test | A |
| 11 | Test schedule for each test types including grid connection test | A |
| Within 1 week before the Final Acceptance Test | | |
| 12 | Final Test Protocol and test schedule | A |
| Within 2 weeks after the Final Acceptance Test | | |
| 13 | Test Report in accordance to Works Information and Annual Reporting requirement in Appendix K (signed by the Contractor) | A |

| No. | Document / Drawing | Review Type |
|--|--|-------------|
| 14 | Calculation of Performance Liquidated Damage and future loss according Works Information for both Performance Ratio and Plant Availability, if any | A |
| 15 | Visual Inspection and Electrical measurement test report (signed by the Contractor) including followings (item no 16 – 19) | A |
| 16 | Final Test Protocol | A |
| 17 | Raw data (unprocessed) or measured data for each test type on site | A |
| 18 | Evaluation of Raw data (processed data) according to Final Test protocol | A |
| 19 | Final results indicating the acceptance or rejection of each test types | A |
| 20 | List of Spare parts list available on Site in compliance to Works Information | A |
| 21 | Proof of transfer of all guarantees and warranties of components and plant to the Employer | A |
| 22 | The Complete plant O&M manual and Component O&M Manual | A |
| Within 4 weeks after the Final Acceptance Test | | |
| 23 | Proof of Payment of second year and future loss Liquidated Damage for performance ratio and plant availability test (if any) to the Employer | A |

- c) The Contractor prepares and submit all information necessary to enable the safe and efficient Final Acceptance Testing, including the items listed below.

| ITEM | REQUIRED |
|--|----------|
| Final Acceptance Test Method Statement | ✓ |
| Final Acceptance Test Documentation | ✓ |
| Final Acceptance Test Certificate | ✓ |
| Final Acceptance Test Report | ✓ |
| Final Acceptance Test Results sheets. | ✓ |
| Complete 'A' Status Equipment Data Sheets | ✓ |
| Complete updated 'A' Status Project Drawings | ✓ |
| Complete updated 'A' Status O&M Manuals | ✓ |
| Guarantees and Warranties Transferred to Eskom | ✓ |
| Employer Training Records & Certificates | ✓ |
| Handover Report | ✓ |