

1.0 Executive Summary

1.1 Overview of Consultancy Services

In consideration of the plans of (Client) to plan & build its bank new data center in Tanzania, preferable compliance to International Standards, Powerware Systems Sdn Bhd or (PWS) is pleased to propose our consultancy service to Client.

The full scope of work for the consultancy services that we can provide includes the professional design works, tender stage & construction stage for the Data Centre and in accordance to the defined project quality assurance and post implementation plan.

We are able to provide this full consultancy services package described herein should this be required from us.

The following are details of our proposal for your consideration.

1.2 Benefits of Consultancy Services

We believe that acquiring consultancy services for the design and construction of Data Centre will bring about the following benefits to the client:

Ensure that important factors of the operation of the Data Centre are taken into consideration during the early design stage.

- Avoid under-specification or over-specification of the technical requirements of the required equipment.
- Expert advice and service can be provided by a Consultant Data Centre specialist rather than by a general M & E consultant / contractor that may not fully understand or consider the finer points of Data Centre requirements.
- The critical components may face problems in the future if not properly designed at the initial stages, eg. Electrical system may have constant tripping problems in the future if designed incorrectly or if future growth needs were not factored into the design. Proper design of the Data Centre can be provided by consultancy services to minimize design fault problems.
- Provide proper advice during tender stage and make sure that critical points are not left out during the tender process.
- Project management consulting service to ensure that the project will be implemented smoothly and on-time.
- Verify that equipment and services are provided in accordance to Sales & Purchase Agreement.
- Ensure that overall Testing & Commissioning of the whole Data Centre is done in accordance to industry standards.

-
- Ensure that necessary drawings and documents are provided for the long term operation and proper maintenance of the Data Centre.
 - Compliance to International Standards

1.3 Design Philosophy and Approach

Westwood adopts a design philosophy that is strongly inclined towards systems that have optimum energy utilization, systems that provide efficient heat ventilation and air cooling, systems which are economical and cost effective in initial cost and systems that are subsequently easy and economical to maintain and operate. This design philosophy will be based on the guidelines of International Standards such as Uptime Institute and ASHRAE.

We continuously invest in substantial time and effort to evaluate different types of systems, equipment and materials to determine which types provide optimum performance, optimum energy consumption, efficient heat ventilation and air cooling, cost effectiveness, quality and reliable low maintenance costs.

We advocate the adoption of Green concepts and initiatives into our design. Emphasis is also placed on designs that are simple, scalable, modular and flexible in nature to cater for future growth and provide operational sustainability.

We believe that it is important to keep our customers well informed, give advice to them on the different options available and to get them actively participate in making decisions about which options to choose from among the alternatives presented to client.

We have senior technical personnel within the company who have been trained and have practical experience on this specialized field of Data Centre Site Infrastructure. We are able to tap on their invaluable knowledge, skills and in-depth experience to provide our customers with a cost effective, practical and optimum solution without compromising on quality and high standard of service.

With our extensive experience in providing DC solutions and consultancy, we shall adopt the best industry methodologies, standards, best practices and compliance to all local authorities to ensure that the infrastructure of DCs are well designed and built to meet their unique operational requirements.

1.4 Stages of Service

The consultancy service will be divided into 4 Phases as follows:

Phase 1: Business Case Study

Phase 2: Plan & Design (Preliminary Design & Detailed Design Development and Review)

Phase 3: Request For Proposal(RFP) and Technical Evaluation

Phase 4: Construction Stage Management

1.5 Modules and Areas Covered

The consultancy services will cover the following modules and areas at Data Centre:

- Data Centre Architectural design layout & floor space planning
- Transformers, electrical power supply & distribution system to Data Centre
- Engine-generator fuel system (bulk storage, point-of-use tanks, pumps, piping and valves, treatment for Data Centre)
- Equipment clean earth system
- Uninterruptible Power Supply System
- CRAC Cooling Systems for Data Centre
- Split unit air-conditioning for ancillary support room
- Fire detection & protection system
- Water detection system
- Raised access flooring
- ICT Services – Telecommunication & Networking and Fiber Optic & Structured Cabling Works
- Security CCTV and Surveillance Systems
- Program Definition establishing capacity (power and cooling) and Tier objectives
- Integrated Electrical equipment schedules showing number and capacity of all backup power production equipment (typically engine generators), continuous power systems (typically, UPS [static or dynamic] and batteries), distribution transformers and branch circuit distribution
- Integrated Mechanical Schematics for the cooling system (including air cooled chilled and condenser water piping, valves, and instrumentation for chilled water systems, or similar level of detail for direct expansion or other cooling systems)
- Environmental Monitoring and Control for the systems above

2.0 Scope of Consultancy Services and Deliverables

2.1 Business Case Study

This is the initial workshop to gather data and design requirements through interactions with the client (or end user) and site survey. In addition, this initial assessment will include the studies on Local Authorities' Specifications and Local Building Codes. These are crucial to further develop the designs which will be precise with the least variation, flexible and scalable to meet the client's operation needs.

Below spells out the scope of work:

- Workshop meetings with client's (or end user's) committee to understand and determine their requirements.
- Workshop meetings with client's committee to understand from them, advise and determine the mode of future expansion.
- Site survey to existing operation plant to understand the client's operation mode and requirements (If any)
- Studies on Local Authorities' Specifications and Local Building Codes to meet their requirement prior to approval.
- Initial summary lists outlining all the design philosophy, criteria and requirements.
- Preparation of User Requirement Analysis report
- Preparation of assessment report, site recommendation and budgetary costing.
- Preparation of Executive Summary & Business Case Report

2.2 Plan & Design

2.2.1 Preliminary Design

This is the stage to assess all the gathered data, requirements, specifications, etc, and then start the design development exercise. Preliminary design is important, which would set the stage for client to determine and assess the value of this project based upon the following outcome from this stage, i.e. budget, site selection (constraints & availabilities), conceptual designs, etc. Below is the scope of work:

- Design brief which reports all the elements for the entire project which will include but not limited to the following:
 - Project objectives.
 - Design standards.
 - Scope of services.
 - Technical criteria.
 - Design parameters.
 - Details approach for each engineering systems, sub-systems / services.
 - Program of works.
 - Staffing.
 - Communication procedures.
- Conceptual design drawings as the basis for further development on design works.
- Report of project budgetary cost which would determine and finalise the requirements for the entire project.

-
- Proposal of innovative features which may add value to the project.
 - Workshop meetings with client's committee to review and finalise the above.
 - Submit a data center strategy plan, design and roadmap of growth.

2.2.2 Detailed Design Development & Review

Upon finalization of the Preliminary Design documentation, the next stage is the detailed design development stage for the whole project. The detailed design will be based on the finalized preliminary design. In this stage, design works for all the engineering elements have to be complete, coordinated and detailed for tendering and construction purpose. The precise outcome from this stage would minimize the variation, and thus prevent the delay of project time in later stages. Below spells out the scope of work:

- Design drawings' details will include but not limited to the following:
 - Floor plan with positioning of equipments.
 - Design calculations.
 - Schematic diagrams.
 - Schedule of equipments / materials
 - Schedule of system control sequence.
- Alternative analysis for better engineering solutions.
- Workshop meetings with client's committee to review and finalize the above.
- Record the conformity and changes on the design.
- Ensure all drawings and specifications of the various disciplines are checked, signed and dated.
- Design Data Centre Infrastructure Management (DCIM) tools to centralize monitor and manage data centre facilities and Information Technology (IT) Infrastructure.
- Identifying opportunities for technology-related improvement based on industrial best practice
- Submit a detailed design which supports robust best practice technological solution, taking into account of user and technical requirements. The design shall be supported by all relevant documentation inclusive but not limited to the diagram, capacity and specification information, project costing, advantage and disadvantages of proposed solutions or recommendations and project timeline.
- Strategic design which benefits data centre operating cost
- Provide design which focus on green and energy efficiency in terms of location, product and material, or recycling of energy, water or others resources to reduce waste, health and safety or environmental degradation
- Provide project initiation documents including a. Master Project Plan, Project roadmap and timeline, Design, Quality Assurance Plan, risk plan, and Project Organization
- Coordinate and follow up with local government or relevant party for building design approval
- Ensure the design is compliance to industry standard and best practise
- Recommend and propose appropriate data centre size either active/active or active/passive with high availability, manageability and scalability covering estimated data centre growth.

2.3 Request For Proposal (RFP) Creation and Technical Evaluation

The Request For Proposal (RFP) will adopt the format of the client or agreed by them. This Request For Proposal (RFP) will consist of engineering specifications, standards, local authorities' specifications, local building codes, bills of quantities, schedule of equipment, schedule of technical data, form / conditions of contract, project schedule, etc. This Request For Proposal (RFP) will form the basis of contract for this project, and together with detailed design drawings, form the basis for construction purpose in later stage. Below is the scope of work:

- Pre- Request For Proposal (RFP) Stage.
 - Draft copy of Request For Proposal (RFP) design drawings and schedule of RFP to client's committee / tender committee for approval.
- Request For Proposal (RFP) Qualification.
 - RFP Qualification Form issued to vendors / contractors.
 - Recommendation on capability, financial and engineering aspects of tenderer to client's committee / tender committee, based on the data tabulated on the Tenderer Qualification Form.
 - List of qualified tenderer to client's committee / tender committee for final approval.
- Request For Proposal (RFP) Calling.
 - Upon the approval from client's committee / tender committee, RFP would be called by issuing the RFP documents and drawings to all the qualified tenderer.
 - RFP duration would be given to tenderer for their submission purpose.
- Request For Proposal (RFP) Evaluation.
 - The evaluation report with recommendations to client's committee / tender committee, based on the data tabulated on pricing and technical data from all collected RFP submission.
 - List of short-listed tenderer to proceed to RFP clarification to tender committee for approval.
- Request For Proposal (RFP) Clarification.
 - List of clarification to tender committee for review.
 - RFP clarification session with tenderer to be attended by tender committee.
 - Duration time would be given to tenderer for re-submission purpose.
- Request For Proposal (RFP) Addendum.
 - Addendum will be submitted to tender committee for approval if any.
 - Addendum will be issued to tenderer during the RFP clarification session if any.
- Request For Proposal (RFP) Award.
 - Workshop meetings with client's committee / tender committee to review the above.
 - Contract documentation to awarded tenderer upon approval from client's committee / tender committee.

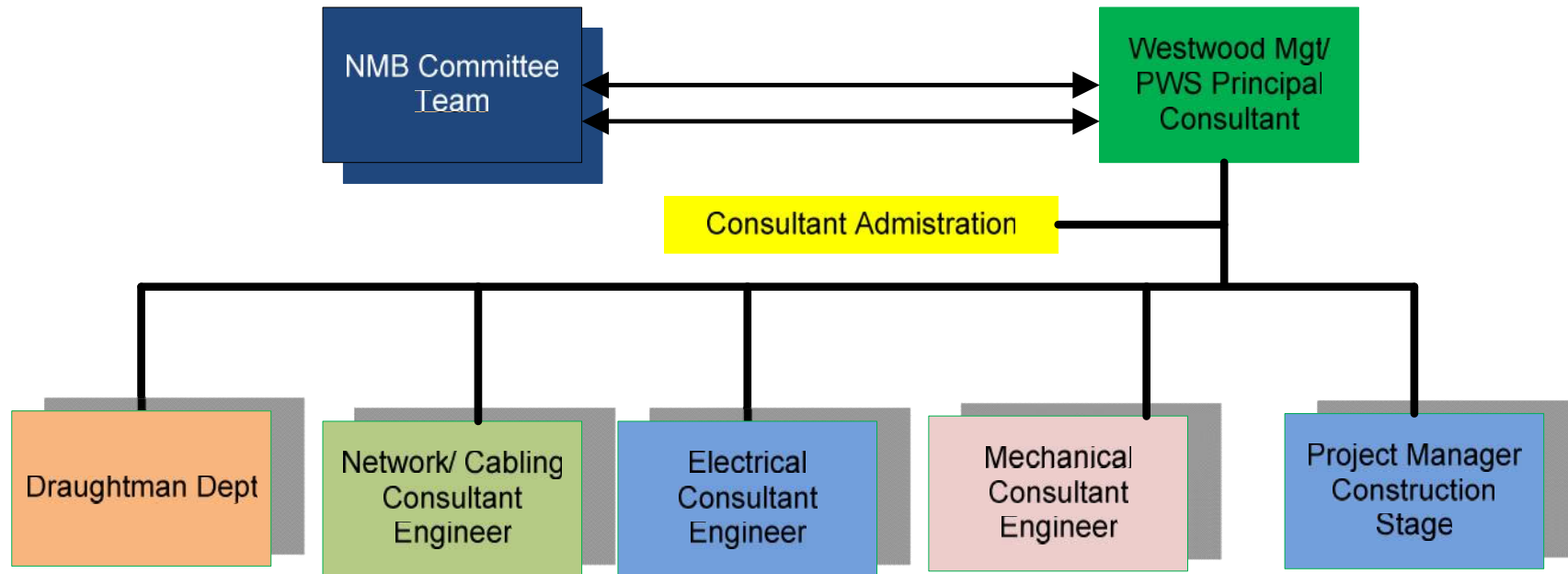
2.4 Construction Stage Management

- Provide Construction stage Management Consulting services to verify the Shop drawings, contract programmes, sub-contractor's management organization chart, test schedule, operating and maintenance manuals.
- Monitoring and liaising with the client on the requirements of the sub-contractor for possession of site.
- Progress monitoring and review of monthly and / or weekly reports submitted by sub-contractor throughout the contract period.
- Preparing the payment certificates
- Advise client on any matter pertaining to the project
- Approval of shop drawings prepared by contractors
- Assisting the client in the assessment and resolution of claims submitted by the sub-contractor.
- Checking delivery of plant.
- Practical completion inspection
- To review operational manual for data centre design, operation process, maintenance, and warranty
- To verify and coordinate User Acceptance Test and Final Acceptance Test and Final Testing and Commissioning of the whole Data Centre
- Issuance of certificates relating to works
- To review training syllabus and schedules

3.0 Consulting Services Team

The following Consulting Services Team will be provided in various phases of the projects.

3.1 Consulting Services Organisation Structure



3.2 Consulting Services Team Members

3.2.1 Head of Data Centre Consulting Services

The head of the Consulting Services or principal is the single point of contact with client technical committee on all technical matters pertaining to the design and certification of Data Centre. He is responsible to make sure the design meets client requirement and comply certain standards that he is adopting. He will lead a team of people in the Consulting team to provide services required to fulfill the high expectations from client. The team consists of CAD drafters, Consulting Engineers for electrical and Consulting Engineers for mechanical and Resident Engineer.

He is responsible to initiate meeting and discussion between his engineers and client technical committee along the process to gather inputs and data to facilitate an ideal design. All the topics of discussion and matters raised will be documented in the form of meeting minutes and will be distributed to the recipient within 3 working days.

He will review the design prepared by his engineers and comment to enhance the design before he approve the design for endorsement by client.

If optional services such as Uptime Tier certifications are required, he will be the main contact with Uptime Institute on all the technical related matters until the certification is acquired.

3.2.2 Consulting Engineer, Electrical

The Consulting Engineer for electrical system is tasked to design the entire electrical system with the inputs or data captured during the early stage.

He will prepare BOD (Basis of Design) for the overall electrical system that includes design and sizing the capacity of the incoming power, HT switchgear, LV switchgear, transformer, UPS, STS, genset, PDUs and etc.

He will be actively involved with the meeting organized by his superior with the client technical committee to gather data and assess information required to facilitate the design. Before the design is sent to client for approval or endorsement, he will get his superior to check, comment and enhance the design.

3.2.3 Consulting Engineer, Mechanical

The Consulting Engineer for Mechanical system is tasked to design the entire mechanical system with the inputs or data capture during the early stage.

He will prepare BOD (Basis of Design) for the associated mechanical system that includes design and sizing of the cooling system, fire suppression system and VESDA.

He will be actively involved with the meeting organized by his superior with the client technical committee to gather data and assess information required to facilitate the design. Before the design is sent to client for approval or endorsement, he will get his superior to check, comment and enhance the design.

3.2.4 CAD Draughtsman

His role & responsibilities are to provide backend services to draw, edit and make changes to the Computer Aided mechanical and electrical drawing.

He will be working closely with the Head of Consulting Service and the Consulting Engineers.

3.2.5 Project Manager

The project manager shall be a certified Project Management Professional (PMP) by the Project Management Institute (PMI). He will be responsible to monitor progress and provide weekly report on progress and technical or commercial issues arising during the project.