

SERVICE AGREEMENT FOR Appointment of A Panel of Service Providers for the Supply, Delivery, Installation and Commissioning of Low Voltage Electrical Distribution Boards (DB) at various SENTECH Transmitter Sites, on an as-and-when-required basis for a period of three (3) years.

Tender Number: SENT/059/2024-25

Made and entered into between

SENTECH SOC LIMITED

Registration Number: 1990/001791/30

("Sentech")

and

NAME OF SERVICE PROVIDER

Registration Number: _____

("the Service Provider")

(Jointly referred to as the "Parties")

1 INTERPRETATION

- 1.1. The headings to the clauses of this Agreement are inserted for reference purposes only and shall in no way govern or affect the interpretation hereof.
- 1.2. Unless inconsistent with the context, the expressions set forth below shall bear the following meanings:

1.2.1. “Agreement” means the terms and condition contained in this agreement and any/all annexures hereto from time to time;

1.2.2. “Commencement Date” means the last signature date.

1.2.3. “**Data**” means any data, including personal information as defined in the Protection of Personal Information Act 4 of 2013, including personal information which is stored, encrypted, decrypted, collected, collated, accessed, recovered, retained or processed by the Service Provider on behalf of Sentech, irrespective of media or form;

1.2.4. “**Parties**” means Sentech and the Service Provider, and “party” shall mean either one of the parties or a combination of them as the context may indicate;

1.2.5. “**Service Provider**” means _____, a company, duly registered and incorporated in accordance with the laws of the Republic of South Africa with registration number _____;

1.2.6. “**Sentech**” means Sentech SOC Limited, a company with limited liability duly registered and incorporated in accordance with the laws of the Republic of South Africa, having its registered office at Octave Street, Radiokop, Roodepoort, with Registration Number 1990/001791/30;

1.2.7. “**Services**” means the duties and responsibilities more fully described in clause 5 of this Agreement and in Annexure “A” hereto;

1.2.8. “**Service Fees**” means the fees more fully described in clause 7 below;

1.2.9. “**Signature Date**” means the date of signature of this Agreement by the party signing last in time by a person duly authorized to do so;

1.2.10. “**VAT**” means Value Added Tax as levied in accordance with the Value Added Tax Act 89 of 1991, as amended.

1.2.11.

2 INTRODUCTION

- 2.1 Sentech requires the Services from the Service Provider in respect of, inter alia, to provide security services to Sentech, as more fully described in clause 5 below and in Annexure “A” hereto.
- 2.2 The Service Provider is willing to provide the Services to Sentech based on the terms and conditions contained herein.
- 2.3 The Parties require that the terms and conditions of their agreement be reduced to writing and signed by them before the same shall be or become binding upon them.

3 APPOINTMENT

- 3.1 Sentech hereby appoints the Service Provider onto a panel of pre-qualified service providers with effect from the Commencement Date to provide the Services and the Service Provider hereby accepts such appointment.
- 3.2 Sentech does not guarantee any work allocation to the Service Provider appointed onto the panel neither does this appointment commit Sentech to any quantum of work to the Service Provider.
- 3.3 The Service Provider shall perform those duties and render the Services more fully described in clause 5 below and in Annexure “A” hereto, in a proper, diligent and satisfactory manner and, at all times, having regard to the requirements and directions of Sentech.
- 3.4 The Service Provider shall devote its time and attention to the affairs of Sentech as necessary to enable it to comply with its contractual obligations hereunder.

4 TERM

- 4.1 The appointment of the Service Provider shall commence on the Commencement Date and shall endure for a period of 36 months thereafter.
- 4.2 Notwithstanding the afore-going, Sentech shall be entitled to terminate the Agreement upon 30 (thirty) days’ written notice to the Service Provider without any liability of any nature whatsoever to the Service Provider.

5 SERVICES

- 5.1 The duties of the Service Provider shall, inter alia, be to provide security services as more fully described in Annexure “A” hereto, as and when required.
- 5.2 In performing the Services established for this panel, the Service Provider undertakes to:
 - 5.2.1 timeously respond to the Request for Quotations / Proposals issued;
 - 5.2.2 attend site inspections when required to do so;
 - 5.2.3 timeously mobilize resources to perform work within a stipulated period;
 - 5.2.4 not collude with other service providers in the panel in responding to Sentech’s requirements;
 - 5.2.5 where possible, obtain local labour as shall be determined by the location of the site where the Services shall be rendered;
 - 5.2.6 at all times carry out its duties and obligations in terms of this Agreement in a competent and professional manner;
 - 5.2.7 at all times act with the utmost good faith towards Sentech and to promptly and punctually carry out and perform all its duties and obligations in accordance with the provisions of this Agreement;
 - 5.2.8 adhere to all Sentech’s rules and regulations whilst on the sites.

Service Provider must be rendered under competent supervision provided by the Service Provider.

- 5.4 The Service Provider shall guarantee that the Service shall be rendered and executed in a professional manner in accordance with the job description as provided by Sentech.
- 5.5 The Service Provider shall guarantee that its personnel shall have the expertise to execute their functions properly.
- 5.6 The Service Provider is not entitled to cede any of its rights or delegate any of its obligations under this Agreement without Sentech's prior written consent.
- 5.7 The Service Provider shall not be entitled to appoint any sub-contractor/s without Sentech's prior written consent. Notwithstanding the appointment by the Service Provider of any sub-contractor/s, the Service Provider shall remain liable for the fulfillment of all its obligations in terms of this Agreement.
- 5.8 The Service Provider shall comply with all the legal requirements of the UIF and Provident Fund for the duration of the Agreement.

6 RIGHTS OF SENTECH

Sentech reserves the right to:

- 6.1 Go outside the panel to source services that cannot be sufficiently fulfilled within the panel;
- 6.2 Approach other service provider's if there are no responses from the service providers on the panel;
- 6.3 Remove a service provider from the panel if the service provider's performance is unsatisfactory or if the service provider does not respond to Sentech's Requests for Quotations for more than three consecutive occasions;
- 6.4 Refrain from using the under-performing service provider for a period not exceeding twenty (24) months;
- 6.5 List a defaulting service provider on the National Treasury Database of prohibited suppliers;
- 6.6 Regularly update the panel through an open tender process;
- 6.7 Negotiate prices received, and
- 6.8 If required, rotate service providers to afford all service providers an opportunity to provide services to Sentech.
- 6.9 To appoint one service provider to a maximum of three panels of security service providers only, to its Regional appointments.

7 SENTECH'S DUTIES

- 7.1 Sentech shall make payment to the Service Provider in terms of clause 8 below.

8 SERVICE FEES AND PAYMENT

- 8.1 Prices shall be on a quotation basis. When Sentech wishes to acquire any of the Goods listed in Annexure A hereto, Sentech shall request the Service Provider to provide a quotation for the cost thereof, which quotation will be valid for a period of 30 days from the date of the quotation.
- 8.2 Payment shall be made to the Service Provider into the following Bank account:
 - Account name:
 - Bank :
 - Account number:
 - Branch code :

Nothing precludes Sentech from withholding payment on any invoice if Sentech, in its sole and absolute discretion, is of the reasonable opinion that the Service Provider has not satisfactorily performed in accordance with its obligations in terms of this Agreement.

9 INDEMNITY

- 9.1 The Service Provider indemnifies and holds Sentech harmless against all liability, damage, obligation, responsibility, cost and expenditure of any nature which may arise out of this Agreement and/ or the use of Sentech's facilities; as well as for any physical damage to the Service Provider's property. Sentech shall not be liable for any damage to the property of the Service Provider which may be caused by its employees, agents, contractors, subcontractors, vehicles and/or activities of Sentech, excluding damage as a result of wilful and/or negligent action. However, any such damage shall be reported to Sentech in writing within 48 (forty-eight) hours, of having knowledge of such damage.
- 9.2 The Service Provider shall indemnify Sentech and keep Sentech indemnified whilst it and/ or its employees are present on the Sentech's premises, or for the duration of this agreement with Sentech, whichever period is the longest, against all losses and claims for injuries or damage, of any nature and howsoever caused, to any person or property whatsoever, which may arise out of or in connection with the Services being performed by the Service Provider.

10 CONFIDENTIALITY

- 10.1 The Service Provider shall keep confidential and not use directly or indirectly, at any time during or after termination of this Agreement disclose or divulge to any person (save and except insofar as may be required by law):
- 10.1.1 any written instructions, drawings, notes, memoranda, data, discs or records (the "documents") relating to Sentech's business and affairs which are made by the Service Provider or which come into its possession during the currency of this Agreement. Any such documents shall be deemed to be the property of Sentech and shall be surrendered to Sentech in the event of the termination of this Agreement by Sentech, and the Service Provider will not retain any copies thereof or extracts therefrom.

11 TERMINATION

- 11.1 Sentech may immediately, and within its sole discretion terminate this Agreement at any time, by providing written notice to the Service Provider if:
- 11.1.1 it is not satisfied with the quality of any of the Services;
- 11.1.2 the Service Provider becomes insolvent, or guilty of fraud or dishonesty, willful default, negligence or incompetence;
- 11.1.3 there is a change in Sentech's strategic direction,
- 11.1.4 circumstances exist justifying such termination at the sole and absolute discretion of Sentech including due to operational requirements.

EXECUTANDI

12.1 The Parties hereto respectively choose *domicilium citandi et executandi* ("*domicilium*") for all purposes of and in connection with this Agreement as follows:

SENTECH

Octave Street,

Radiokop Ext. 3

Honeydew

Private Bag X06

Honeydew, 2040

Fax: 086 743 1794

Attention:

Executive: Legal and Regulatory

AND

The Service Provider

Tel:

Fax:

Email:

other shall be deemed to be received by

the addressee:

12.2.1 on the date on which the same was delivered to the addressee's *domicilium*, if delivered by hand (unless proven otherwise); or

12.2.2 on the date on which the same was despatched by facsimile transmission at the addressee's *domicilium* (unless proven otherwise).

12.2.3 Any party hereto may change a *domicilium* referred to above to any address within the Republic of South Africa by giving written notice to that effect to the other party hereto.

12.2.4 The Parties hereto shall be entitled to change their *domiciliumi* from time to time provided that any new *domicilium* selected by them shall be situated in the Republic of South Africa and any such change shall only be effective upon receipt of notice in writing by the other party.

13 DATA PRIVACY AND PROTECTION

13.1 The Service Provider acknowledges that in providing the Services to Sentech, the Service Provider may be exposed to Sentech's Data, including Data of any of Sentech's clients and/or other third parties.

13.2 The Parties specifically record that all Data provided by Sentech to the Service Provider, or to which the Service Provider may be exposed, shall constitute Confidential Information and as such, the Service Provider shall comply with all the provisions of clause 10 with regard to such Data.

13.3 The Service Provider hereby warrants in favour of Sentech that it shall at all times strictly comply with all applicable legislation and with all the provisions and requirements of the Sentech's Data protection policies and procedures, as may be updated from time to time, and any further requirements of which Sentech may, from time to time, advise the Service Provider in writing, or which may be required by legislation, regulation or any relevant industry body, whether within the Republic of South Africa or elsewhere in the world.

13.4 The Service Provider hereby warrants and undertakes that it shall not, at any time copy, compile, collect, collate, process, mine, store, transfer, alter, delete, interfere with or in any other manner use Data for any purpose other than with the express prior written consent of Sentech, and to the extent necessary to provide the Services to Sentech. All data and software, including Sentech Data, provided by Sentech or accessed (or accessible) by Service Provider Staff members shall be used by such Staff members only in connection with the provision of the Services and shall not be commercially exploited by the Service Provider in any manner whatsoever.

shall ensure that all its systems and operations which it uses to provide the Services, including all systems on which Data is copied, compiled, collected, collated, processed, mined, stored, transmitted, altered or deleted or otherwise used as part of providing the Services, shall at all times be of a minimum standard required by law and further be of a standard no less than the standards which are in compliance with the international best practice for the protection, control and use of Data.

- 13.6 The Service Provider indemnifies and holds harmless Sentech for any loss, whether direct or indirect, arising out of a failure to process any Sentech Data in accordance with the applicable laws.

14 BREACH

- 14.1 Should any Party ("the defaulting Party") commit a breach of any of the provisions of this Agreement, then the other Party ("the aggrieved Party") shall be obliged to give the defaulting Party 14 (fourteen) days' written notice or such longer period as may reasonably be required in the circumstances, to remedy the breach. If the defaulting Party fails to comply with such notice, the aggrieved Party shall be entitled to cancel this Agreement against the defaulting Party or to claim immediate payment and/or specific performance by the defaulting Party of all the defaulting Party's obligations whether or not the due date for payment and/or performance shall have arrived, in either event without prejudice to the aggrieved Party's rights to claim damages. The foregoing is without prejudice to such other rights as the aggrieved Party may have at law; provided always that, notwithstanding anything to the contrary contained in this Agreement, the aggrieved Party shall not be entitled to cancel this Agreement for any breach by the defaulting Party unless such breach is a material breach going to the root of this Agreement and is incapable of being remedied by payment in money, or if it is capable of being remedied by payment in money, the defaulting Party fails to pay the amount concerned within 14 (fourteen) days after such amount has been finally determined.

15 WHOLE AGREEMENT

- 15.1 This Agreement constitutes the whole Agreement between the Parties as to the subject matter of this Agreement and no agreements; representations or warranties between the Parties other than those set out herein will be binding on the Parties.

16 VARIATION

- 16.1 This agreement, including this clause, cannot be varied, added to, or cancelled by agreement otherwise than by means of a further written and signed agreement between the parties.

- 17.1 No latitude, extension of time or other indulgence which may be given or allowed by either Party to the other in respect of the performance of any obligation hereunder or the enforcement of any right arising from this Agreement and no single or partial exercise of any right by either Party shall under any circumstances be construed to be an implied consent by such Party or operate as a waiver of, or otherwise affect any of that Party's rights arising from this Agreement.

18 EXECUTION:

THUS DONE AND SIGNED AT _____ ON THIS THE ____ DAY OF _____ 202_ IN THE PRESENCE OF THE UNDERSIGNED WITNESSES.

DULY AUTHORISED FOR AND

ON BEHALF OF SENTECH SOC LIMITED

NAME: **ZUNAID ADAMS**

DESIGNATION: EXECUTIVE: LEGAL AND REGULATORY

WITNESSES

1. _____

2. _____

THUS DONE AND SIGNED AT _____ ON THIS THE ____ DAY OF _____ 202_ IN THE PRESENCE OF THE UNDERSIGNED WITNESSES.

DULY AUTHORISED FOR AND

ON BEHALF OF _____

NAME: _____

DESIGNATION: _____

WITNESSES

1. _____

2. _____

ANNEXURE A

SCOPE OF WORK

PURCHASER'S GOODS INFORMATION

Appointment of A Panel of Service Providers for the Supply, Delivery and Commissioning of Low Voltage Electrical Distribution Boards (DB) at various SENTECH Transmitter Sites, on an as-and-when-required basis for a period of three (3) years.

1. Background

Sentech is a state-owned company and is the largest broadcasting signal distributor in South Africa. Sentech is a licensed Electronic Communications Network Service provider in South Africa. It currently operates many telecommunication networks for Satellite, Television, Radio, Internet, and more. As such, Sentech is a global enabler of broadcasting and digital content delivery.

Sentech, therefore, invites bids for the Manufacture and Supply of Low-Voltage Distribution Boards at various Transmitter Sites, as and when required for a three (3) year period. The requirements for this tender are intended to support Sentech's strategic Capex, FM, and ATV replacement projects. The Low Voltage distribution board designs will vary from site to site based on the different load requirements of each transmitter station.

This document describes the extent of work expected from the successful bidder and the minimum technical and physical requirements for the equipment.

2. SCOPE

This specification covers the manufacture, testing at works, and deliveries of Low Voltage Distribution Boards to Sentech, Honeydew.

3. STANDARDS AND REGULATIONS

The Low Voltage Distribution Boards shall be designed to fully meet the requirements of the latest revisions and amendments of the following Acts, Regulations, Standards, and Recommendations.

3.1.Occupational Health and Safety Act (No 85 of 1993)

3.2.SANS 10142-1: Latest Edition

The wiring of Premises Part 1: Low Voltage Installations

3.3.SANS IEC 60439 -1:Latest Edition

Low-voltage switchgear and control gear assemblies

Part1: Type-tested and partially type-tested assemblies

3.4.SANS 1765:Latest Edition

Low-voltage switchgear and control gear assemblies

(Distribution Boards) with a rated short-circuit withstand strength up to and including 10kA

3.5.SANS 1973-1:Latest Edition

Low-voltage switchgear and control gear ASSEMBLIES Part 1: Type-tested ASSEMBLIES with stated deviations and rated short-circuit withstand strength above 10 kA

3.6.SANS 60529: Latest Edition

Degrees of protection provided by enclosures (IP Code)

3.7.SANS 1091:Latest Edition

National colour standard

3.8.SANS 1507-1:Latest Edition

Electric cables with extruded solid dielectric Insulation for fixed installations (300/500V to 1 900/3 300V).

3.9.SANS 1195: Latest Edition

Busbars.

3.10. SANS 767-1:Latest Edition

Earth leakage protection units Part 1: fixed earth leakage protection circuit breakers.

3.11. SANS 6004-1:Latest Edition

Instrument Transformers Part 1: Current transformers

3.12. SANS 60269-1:Latest Edition

Low Voltage fuses Part 1: General requirements.

3.13. IEC 60051 - :Latest Edition

Direct acting indicating analogue electrical measuring instruments and their accessories.

4. PERFORMANCE REQUIREMENTS

4.1.Electrical Performance Requirements (Operating at full rating).

The temperature of any component or compartment, under the following power and environmental conditions, shall not exceed the lesser of either the maximum temperature recommended by individual equipment suppliers, or the maximum temperature indicated in the relevant SANS, or IEC standard.

4.2.Power Supply Details:

Nominal supply Voltage 400V	3 phase 4 wire
Variation	+10% to – 10% on nominal voltage
Frequency	50Hz
Variations on frequency	+/-2%
Total harmonic distortion	<6%
Fault level	10Ka

5. VENTILATION AND OPERATING ENVIRONMENT

Boards fitted with equipment generating heat shall be arranged to prevent heat. Boards fitted with equipment generating heat shall be arranged to prevent heat from building up to a temperature that could damage any equipment or cable on the board. Any openings provided for ventilation purposes shall be suitably vermin-proofed using expanded metal or wire mesh screens. Where distribution boards are supplied for coastal areas, such vermin-proofing shall not be secured using spot welding.

Distribution boards shall be cooled using radiation and conventional cooling only. Fans shall not be used for cooling purposes unless otherwise specified in the detailed specification

Environmental Operating Conditions:

Altitude (for design purposes)	2000m above sea level
Maximum air temperature	+ 40 degrees Celsius
Minimum air temperature	-10 degrees Celsius
Relative Humidity	Between 20% and 90% non-condensing
Location	Indoors unless otherwise specified

6. MECHANICAL CONSTRUCTION

All switchboards shall have either front, back, or side access only. Extreme care must be taken to ensure that all equipment, including busbars are mounted in such a way that they are readily accessible from the front.

All holes for fixing screws are to be tapped or captive nuts must be used. No self-tapping screws may be used.

Pan-type doors shall be used for all compartment housing terminals, contactors, and selector switches.

Removable fascia panels with machine-punched slots must be fitted over all circuit breakers.

All meter and selector switches must be flush mounted in the doors.

Terminals must be sized to accommodate the incoming cables and must be arranged for ease of connection.

Blank-off or removable fascia panels shall consist of blank plates in vacant MCB positions and shall be firmly secured. Easily removable metal covers to be alternatively used where applicable.

All distribution boards and their components shall be constructed to withstand fault currents in accordance with any specified and/or implied values.

7. PAINTING

The interior mounting panels of all switchboards shall be white powder-coated.

The following colors of powder coating finish shall be applied to the exterior of the boards:

Frames and architrave frames	SANS 1091: 2004 Electric Orange B26
Doors	SANS 1091: 2004 Red A11
	SANS 1091: 2004 Blue F28

All drilling, cutting and other metal work must be completed before the painting process is commenced. All distribution board finishes shall be made good to the satisfaction of Sentech before final handover.

8. LABELLING

All labelling shall be in English

All distribution boards shall be labelled in the sequence shown on the drawings and as specified.

The electrical manufacturer shall obtain final information from Sentech before labelling any boards.

All grouped single-pole circuit breakers on distribution boards shall be numbered by means of suitable engraved printed plastic or ivorene plates.

A legend card, covered by a removable glass or 2mm transparent acrylic plastic (Perspex) or equivalent panel shall be installed on the door of the distribution boards or cubicles and circuits shall be designated on this card. All other equipment shall be individually labelled, indicating function. All plates shall be fixed to panels by means of screws or channelling.

Black letters on a white background shall be used for all normal labels and red letters on white or yellow background for danger notices.

The main isolating switch or switches shall be clearly labelled in accordance with the regulations. Where more than one incoming feed is utilized, or supplies obtained from other sources for purposes of control, danger notices shall be provided.

Labels shall not be secured to components or trunking covers, but shall be fixed onto doors, panels, chassis or other permanent structures of the boards, as the case may be.

The reference name of the distribution board, and the origin of supply cables shall be clearly labelled on all boards.

All equipment situated inside the board, e.g. contactors, relays, timers, and time switches shall be clearly marked, indicating function and circuit control.

The layout of the board with its components and wiring facilities shall be such that the labels are not obscured, but visible at all times.

9. DOORS

All Distribution Boards shall be equipped with doors unless otherwise specified

Where doors are required, they shall be manufactured of the same gauge material as the remainder of the panels.

Doors shall be suitably braced to ensure stiffness and shall have a smooth flat finish.

Door hinges shall be heavy-duty and shall be constructed to permit the removal of doors.

Doors shall open 180 degrees.

10. REMOVABLE PANELS

Removable front panels of sheet steel, finished in a color to be specified, shall be suitably stiffened, with machine-punched slots to allow for flush mounting of equipment.

All removable front panels shall be secured using quick-release fasteners similar and equivalent to suitable size DZUS type.

Front panels carrying instruments shall be hinged and secured with quick-release fasteners as specified above.

Where nuts are visible, chromium-plated dome nuts and washers of adequate size shall be used.

11. ACCESS

Sufficient removable panels shall be provided to afford access to all equipment for Maintenance purposes.

Access on LV Boards will be specified by Sentech using single line diagrams, the construction thereof and orientation of C'T's and other equipment shall be such that all connections, circuit breakers, etc. shall be accessible only from the front of the board.

12. FAULT CURRENTS

The fault level rating of each board shall be specified and indicated on the single-line diagrams.

All distribution boards and their components shall be constructed to withstand fault currents in accordance with any specified and/or implied values.

Factory-built Distribution Boards, with short-circuit ratings less than 10kA, shall comply with the requirements as set out in SANS 1765:Latest Edition and SANS 10142-1: Latest Edition as amended.

Factory-built Distribution Boards, with short-circuit rating greater than 10kA, shall be either type-tested or type-tested with deviations or specially tested assemblies, in accordance with SANS 1973-1 and SANS 10142-1.

Tests of the main busbar only shall not be acceptable, but all busbars, cabling, and wiring from the main busbars to the input side of all switchgear shall be included.

Small wiring direct from busbars shall be protected by means of protection fuses mounted directly onto busbars. Busbar-mounted fuses shall be provided with insulated back plates to afford complete safety from hand contact with live parts.

13. BUSBARS

Busbars shall be installed in all distribution boards and may run either horizontally or vertically

All terminations onto busbars and busbar interconnections shall be bolted with cadmium-plated high tensile bolts, washers, spring washers, and nuts.

Busbars shall be mounted on substantial porcelain or other approved insulators. Bare conductors shall be so spaced that with all clamps, lugs, and lead-off in position, the spacing between any conductor and earth

shall not be less than 40mm. Busbars, spacing between busbars, and connections thereto shall comply with SANS 1195: Latest Edition

Connections to the busbars shall be effected by means of the correct clamps or lugs with soldered connections or with connections crimped with the correct equipment. The following colors shall be used:

NUMBER OF PHASES	PHASE COLOUR	NEUTRAL COLOUR	SPECIAL PURPOSE COLOUR	
1.	Red	Black	Green / Yellow	Orange
2.	Red and White	Black	Green / Yellow	Orange
3.	Red, white and blue	Black	Green / Yellow	Orange

Where busbars are mounted horizontally the longer dimensions shall be designed to withstand the mechanical and thermal stresses of any possible short circuit that could occur at that point in the system. Busbars shall be high purity, hard-drawn tinned copper only, of an adequate size such that the current density of the busbars shall not exceed $1,5A/mm^2$. Neutral busbars shall have the same cross-section as phase bars. The current carrying capacity of the busbars shall in all instances not be less than the current carrying capacity of the main isolator specified for the distribution board.

Busbars shall be pre-drilled to allow 25% future connections.

The busbars and any insulated connection busbars shall be sleeved with heat shrink-type material by the manufacturers of the board over their entire length, except at joints. Color coding of the busbars shall be strictly observed.

14. EARTH BAR

A 50mm x 6mm solid earth bar with sufficient ways for all the earth conductors and 30% spare space shall be provided in an easily accessible position near the cable entry points as specified. On small sub-distribution boards, 25 x 6mm solid earth bars shall be provided.

15. WIRING

Adequate space must be provided for the accommodation of internal wiring. All internal wiring shall either be laced or run in wiring channels and shall be clearly marked with numbered ferrules and color coded.

1Stranded wire shall comply with SANS 1507 -1:Latest Edition and have a minimum cross- section of $2,5mm^2$. The minimum size of wire to switchgear shall be $10 mm^2$ in sub-boards and shall be phase color-coded. For Distribution Boards where the short-circuit rating exceeds 10 kA the minimum cross-sectional area of conductors used for connection between the busbar and the functional unit shall be $16mm^2$.

Looping from the terminal of a switch, circuit breaker, or isolator will be allowed for a maximum of two outgoing circuits only. More than two circuits must be connected to busbars. All wiring cross-sectional areas shall be sized according to the SANS 10142-1:Latest Edition wiring regulations.

All internal wiring to the board shall be carried out in PVC insulated conductors of adequate size. The insulation color shall correspond to the phase color code. All jumpers between busbars and circuit breakers rated over 150 amperes shall be solid copper, insulated by means of heat shrink sleeving.

All wiring shall be kept free and away from any exposed terminals or other insulated current-carrying parts. PVC trunking with slotted sides shall be the preferred method of housing wiring.

Only hexagon crimping on all wiring shall be used.

Wires shall be marked at all termination points and circuit breakers by the numbering of the distribution board manufacturer's wiring diagram using a suitable marker.

An emergency notice shall be provided to indicate "In emergency switch off" over mains incoming MCB. Where two inputs are required i.e. Mains & STG, the notice shall indicate "In emergency switch off mains & STG incoming MCBs simultaneously"

A common Din rail type 15 ampere terminal strip shall be provided for the connection of external control wiring. The terminal strip shall be of robust construction, and firmly secured to the boards, and all terminals shall be clearly marked by the distribution board manufacturer's working drawings and wiring diagrams.

16. CLEARANCE

Sufficient space shall be left inside panels for incoming and outgoing cable connections and for interconnections and control wiring, taking into account the sizes and quantities of cables and wires involved.

Equipment on distribution boards may be installed abutting. Undue cramping of equipment and wiring shall, however, not be permitted and the following clearances shall be maintained:

Clearance of not less than 75mm between sides, top and bottom of architrave, and any equipment mounted on the chassis.

Clearance of not less than 75mm between rows of equipment (measured between terminals)

17. FREE STANDING DISTRIBUTION BOARDS.

Free-standing boards shall be of the free-standing pedestal type with or without doors as specified and shall be so designed as to enable the board to be extended without undue difficulty

The switchboard shall be constructed of 2mm sheet steel suitably stiffened and reinforced and shall be complete with all equipment, internal wiring and labelling.

A suitable removable gland plate for mounting cables shall be provided for termination of cables. Cables and busbars can enter and leave boards from both above and below as specified.

Minimum height of gland plate shall be not less than 300mm unless specified elsewhere.

18. FLUSH AND SURFACE MOUNTED DISTRIBUTION BOARDS

Both flush and surface mounted distribution boards shall consist of an architrave frame which shall carry the chassis for equipment, panel and door and a bonding tray onto which the architrave frame shall be secured.

Bonding trays for flush-mounted boards shall be designed to be built into the wall and shall have expanded metal spot welded to the rear and sufficient metal strap on the sides.

The trays shall be rust-proofed.

The tray shall be constructed of a minimum of 1,2mm sheet steel suitably braced by means of gussets and shall be of adequate size to accommodate specified equipment without congestion.

Bonding trays for surface-mounted boards shall be designed to be slightly larger than the architrave frame and returned to present a flat surface onto which the architrave frame shall fit.

The finish of the tray shall match the finish of the board.

The architrave frame shall be constructed of a minimum of 1,2mm sheet steel and formed with bevelled edges, which shall accommodate panel, chassis and door(s). The frame shall be fixed to the tray in such a manner as to allow for adjustment for depth and out-of-plumb.

The chassis shall be of rigid construction for mounting of equipment and shall be fixed to the architrave frame of tray and provided with the necessary means for fixing of the required equipment.

19. BARRIERS

Non-combustible barriers between sections of the distribution boards shall be provided in the following instances:

- To separate section of boards which are fed from different transformers or sources of supply.
- To isolate each main incoming circuit breaker where the expected level of fault current exceeds 15kA.

A group of 3-phase and neutral or single phase and neutral busbars or single core conductors crossing a ferrous metal barrier shall do so through a common opening only, which shall be suitably bushed or insulated.

20. LIGHTING SURGE ARRESTORS

Lightning surge arrestors shall be provided as specified on attached single line diagrams Appendix 1 for each phase and for the neutral in all boards. Lightning surge arrestors shall be Class 1 for Main Distribution Boards and Class 2 for Sub Distribution Boards.

Lightning surge arrestors shall be connected to the phase, neutral and earth busbars by means of the shortest possible leads, which shall in any event not exceed 450mm in length per arrestor and as per supplier's installation procedures.

21. SWITCHES AND SELECTOR SWITCHES

All switches and selector switches shall be capable of breaking the full load current.

The fault level of the switches and selector switches shall be equal to or higher than the prospective fault levels at the associated busbars, but in any case not less than 5kA.

Voltmeter selector switches shall be suitable for a three-phase, 400V/230V, and 50Hz system and shall be so arranged that voltage between phases and phases to neutral can be read. Voltmeter selector switches shall be of the break-before-make type

The voltmeter selector switch shall have one "off" and six "metering" positions suitable for panel mounting in such a way that the operating knob and indicator plate can be mounted on the front of a panel and the switch itself at the back of the panel

Ammeter selector switches shall be of the make-before-break type with one "off" and three "metering" positions. When in the "off" position the metering circuits shall be short-circuited.

The physical construction of ammeter selector switches shall conform to that of voltmeter selector switches.

The operating knob and indicator plate of the selector switches shall be manufacturer of insulating material with the switch positions clearly and indelibly marked thereon

The switches shall be provided with substantial contacts with the terminals clearly marked and arrange for easy wiring.

The voltmeter or ammeter selector switch shall be mounted directly below the associated voltmeter or ammeter.

A V R and/or UPS by-pass switches shall be mounted within the switchboard doors. By-pass switches shall be of break-before-make type.

22. CONTACTOR AND RELAYS

All contactors and relays shall have coils to suit continuous operation at the operating voltages.

All contactors and relays shall be able to withstand the prospective short circuit current that can occur at the point where the contactor or relay is installed.

All relays and contactors used in normal supply/standby supply changeover circuitry shall be electrically and mechanically interlocked.

All contactors, unless otherwise specified, shall have two normally open and two normally closed auxiliary contacts.
All contactors and relays shall be clearly marked.

23. PROTECTION RELAYS

All overload relays shall be adjustable manual reset units.

All protection devices shall be capable of withstanding the fault current that could occur at the point in the system where the unit is installed.

24. EARTH LEAKAGE RELAYS

All earth leakage relays shall comply with SANS 767 -1: Latest Edition.

25. AMMETERS

The ammeters shall be of the flush-mounted type

All instruments shall comply with the requirements of IEC 60051-1:Latest Edition. The ammeters shall be 5 ampere instruments of 96mm square format or otherwise as approved by Sentech.

Ammeters shall be of the MISC movement with both instantaneous and thermal demand indication, having an integrating lag of 15 minutes or otherwise specified by Sentech.

The ammeter scale shall be direct reading with a full-scale deflection corresponding to approximately 120% of the rated circuit current

If separate ammeters are required each ammeter shall be marked with the appropriate phase colour to which it is connected and ammeters shall be mounted in groups of three in a horizontal line clearly marked to indicate to which feeder they are connected. The ratio of the current transformer associated with the ammeter shall be clearly indicated on the ammeter scale.

All ammeters shall be fitted with zero-adjustments screws.

26. CURRENT TRANSFORMERS

Current transformers for the LV switchgear shall be of the ring type, complying with the requirements of SANS 60044-1:Latest Edition.

Current transformers for indication circuits shall be Class 1 rated in accordance with SANS 60044-1: 2003 dependent upon primary current.

The current transformer ratio shall match the rating of the circuit to which it is connected.

Each current transformer shall be provided with a robust mounting bracket and proper terminal studs on the circumference of the coil for the connections

A nameplate shall be fixed to each current transformer on the circumference of the coil in such a position that it can be easily read from outside the board after removal of the access panels. The nameplate shall clearly indicate the class, rating, ratio, P1, P2, S1 and S2 connections and the function of the current transformers.

The current transformers shall be mounted on rigid supports above or below the relevant switchgear in a manner as to facilitate the threading through of the interconnecting wiring to the relevant switchgear.

Current transformers shall only be installed on the load side of feeder circuit breaker.

The current transformers shall be insulated for 660 volt between phases and shall be capable of withstanding for the duration of time taken by the circuit breaker to clear the fault (with protective devices set at the maximum settings), the fault currents that could occur at the point in the system where the current transformers are installed.

27. VOLTMETERS

Voltmeters shall be of the flush panel mounting, moving iron, suppressed zero type scaled from 0-500 Volt or otherwise specified by Sentech.

The voltmeter shall be of the 96mm square format or otherwise as approved by Sentech and shall match the ammeters previously specified. It shall also comply with requirements laid down in IEC 60051-1:Latest Edition.

All voltmeters shall be fitted with zero adjustment screws.

28. POWER METERING

Where power metering is required a PM 5500 (Schneider Electric) unit or approved equivalent shall be supplied.

29. PILOT LIGHTS

Where pilot lights are specified, they shall be of LED type suitable for 230 VAC operations. The pilot lights shall have either circular (25mm minimum) or rectangular (20mm x 25mm) lenses.

The colours used for the lenses shall be as follows:

Pilot lights indicating "Run" status	- Green
Pilot lights indicating "Stop" or "Off" status	- Red
Pilot lights indicating "Tripped" or "Alarm" conditions	- Amber

The pilot light shall be suitable for mounting through cubicle doors, with connections to the wiring occurring at the rear of the doors. The ring nuts and lamp holders shall allow quick installation and removal of the pilot lights and shall be fitted with lock washers or other suitable means of locking in position and to prevent the pilot lights from shaking loose under the influence of vibration.

It shall be possible to replace the LED lamp from the front of the panel, without the use of special tools or equipment.

The function of the pilot light shall be clearly indicated either by means of a separate label or thorough engraving on the lenses of the pilot lights.

30. TERMINAL BLOCKS

Terminal blocks shall be of the line-up type, suitable for clipping into a mounting channel. The terminal bodies and screws shall be of non-corrosive metal, enclosed in fire resistant, moulded plastic insulating bodies. Terminal bodies or screws shall not project beyond the insulation material and shall afford suitable protection against accidental contact by personnel and against short circuits and tracking. The minimum size of terminal blocks shall be 4 mm².

The construction of the terminal block and mounting rail shall be such as to ensure a firm and positive location of the terminal block. It shall be possible to add additional terminal blocks within the terminal sequence without having to disconnect or dismantle the terminal strip. The terminal blocks shall be held in position by means of standard end clamps.

It shall be possible to intermix terminals of various sizes, i.e. for different sizes of conductors, whilst utilising the same mounting rail. Where smaller terminal block occur adjacent to large terminal blocks, suitable shielding barriers shall be inserted in between the cover the terminals that might otherwise be exposed. The terminal bodies and clamping screws shall be so constructed as to ensure that conductors are not nicked or severed when clamping screws are tightened.

Terminals shall be sized and rated to match the conductors that are connected to them. All lighting and small power circuits shall be installed with a double set of terminals.

Each terminal block shall have provision for clip-in numbering or labelling sheets to be installed, together with protective, clear caps over the sheets in a manner so as to ensure that physical damage or damage to paint work due to impact or chafing during transport is prevented.

31. DRAWINGS TO BE SUBMITTED FOR APPROVAL BEFORE CONSTRUCTION

The Contractor shall submit a detailed programme in respect of manufacturing & delivery, immediately after being awarded the Contract.

Prior to the commencement of manufacture of the Distribution Boards, the following drawings shall be submitted to Sentech for approval

- Panel general arrangement drawing(s) showing overall dimensions and positions and dimensions of busbars.
- Panel layout drawings showing mounting positions of equipment and free space between equipment.
- Panel door layout showing relative positions and dimensions of equipment mounted on the panel doors.
- Schedule of all labels showing size of label and letters and the wording of the label.

Failure to comply with this requirement timeously may result in rejection of the Distribution Board.

32. QUALITY ASSURANCE REQUIREMENTS

Inspection during Manufacture -Sentech or his appointed representative shall be permitted to carry out, during normal working hours, periodic inspections of the Distribution Boards and equipment covered by this specification. Immediately before delivery-Sentech or his appointed representative shall be permitted to witness final Factory Tests of the Distribution Boards and equipment before delivery will be permitted. The manufacturer shall provide all power supplies, testing equipment, means of simulating related remote devices and competent personnel to conduct the tests.

Equipment may not be delivered to Sentech until the manufacture has cleared all defects listed by Sentech

33. ROUTINE TESTS

The following tests shall be carried out on all Distribution Boards in the manufacturer's works and if Sentech so requires must be witnessed by the company.

All tests shall be carried out in accordance with the procedure laid down in SANS 1973-1, SANS 1765 and/or SANS 10142-1, as applicable.

- A high voltage test of 2000 Volts, 50Hz, and AC for one minute between each phase and in turn with the remaining phase earthed.
- A 1000 Volt megger test on all insulated sections, from phase-to-phase and phase- to-earth. Resistance readings shall exceed 1.0 Meg ohms.
- Full operational tests of any relay gear or switchgear installed on the board.
- A trip test on all earth leakage units by creating an earth fault of appropriate magnitude.
- A current injection trip test on all main breakers to ensure that they trip at their set currents.
- Such other tests as may be laid down in the Detailed Requirements.

All test results shall be recorded on the manufactures standard test certificate, three copies of which, duly approved, shall be supplied to Sentech within one week of the factory test being completed.

Price List (not for evaluation purposes, **all the content is below**)

SCHEDULE 1: Distribution Board Diagram Costing Table (not for evaluation purposes)

Item	Description	Unit	Quantity	Rate	Amount
1	Main DB Board (1000A/800A/630A)				
1.1	<u>Single Line Diagram (DwgN13400 /E/201) sh1 & sh2</u>				
1.1.1					
1.1.2					
1.1.3					
1.1.4					
1.1.5					
1.1.6					
1.1.7					
1.1.8					
1.1.9					
1.1.10					
1.1.11					
1.1.12					
1.1.13					

Item	Description	Unit	Quantity	Rate	Amount
1.1.14					
	<i>Insert more lines if required</i>				
1.2	General Arrangement Diagram (<u>DwgN13400 /E/202</u>)				
1.2.1					
1.2.2					
1.2.3					
1.2.4					
1.2.5					
1.2.6					
1.2.7					
1.2.8					
1.2.9					
1.2.10					
1.2.11					
1.2.12					
1.2.13	<i>Insert more lines if required</i>				
TOTAL CARRIED FORWARD				R	

SCHEDULE 1: Distribution Board Diagram Costing Table

Item	Description	Unit	Quantity	Rate	Amount
1	Main DB Board (400A)				
1.1	<u>Single Line Diagram</u>				
1.1.1					
1.1.2					
1.1.3					
1.1.4					
1.1.5					
1.1.6					
1.1.7					
1.1.8					
1.1.9					
1.1.10					
1.1.11					
1.1.12					
1.1.13					
1.1.14					
	<i>Insert more lines if required</i>				
1.2	General Arrangement Diagram				
1.2.1					
1.2.2					
1.2.3					
1.2.4					
1.2.5					
1.2.6					
1.2.7					
1.2.8					
1.2.9					

Item	Description	Unit	Quantity	Rate	Amount
1.2.10					
1.2.11					
1.2.12					
1.2.13					
1.2.14	<i>Insert more lines if required</i>				
TOTAL CARRIED FORWARD		R			

SCHEDULE 1: Distribution Board Diagram Costing Table

Item	Description	Unit	Quantity	Rate	Amount
1	Main DB Board (250A)				
1.1	<u>Single Line Diagram</u>				
1.1.1					
1.1.2					
1.1.3					
1.1.4					
1.1.5					
1.1.6					
1.1.7					
1.1.8					
1.1.9					
1.1.10					
1.1.11					
1.1.12					
1.1.13					
1.1.14					
	<i>Insert more lines if required</i>				

Item	Description	Unit	Quantity	Rate	Amount
	General Arrangement Diagram				
1.2.1					
1.2.2					
1.2.3					
1.2.4					
1.2.5					
1.2.6					
1.2.7					
1.2.8					
1.2.9					
1.2.10					
1.2.11					
1.2.12					
1.2.13					
1.2.14	<i>Insert more lines if required</i>				
TOTAL CARRIED FORWARD		R			

SCHEDULE 1: Distribution Board Diagram Costing Table

Item	Description	Unit	Quantity	Rate	Amount
1	Main DB Board (100A)				
1.1	<u>Single Line Diagram</u>				
1.1.1					
1.1.2					
1.1.3					
1.1.4					
1.1.5					

Item	Description	Unit	Quantity	Rate	Amount
1.1.6					
1.1.7					
1.1.8					
1.1.9					
1.1.10					
1.1.11					
1.1.12					
1.1.13					
1.1.14					
	<i>Insert more lines if required</i>				
1.2	General Arrangement Diagram				
1.2.1					
1.2.2					
1.2.3					
1.2.4					
1.2.5					
1.2.6					
1.2.7					
1.2.8					
1.2.9					
1.2.10					
1.2.11					
1.2.12					
1.2.13					
1.2.14	<i>Insert more lines if required</i>				
TOTAL CARRIED FORWARD		R			