SERVICE LEVEL AGREEMENT FOR PRE-QUALIFIED SERVICE PROVIDERS

Appointment of Additional Contractors to the Existing Panel of Pre-Qualified Service Providers for the Supply and Construction of Structural Steel Towers/Monopoles, for a Period Coterminous with the Existing Three-Year Panel Contract.

SENT/010/2026-27

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 conditions contained in this agreement and any/all annexures hereto from time to time;

1.2.2. "Commencement Date" means_____

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 _____;

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.

2 INTRODUCTION

2.1 Sentech requires the Services from the Service Provider in respect of, inter alia, to _____of 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 to a Panel of 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 on the Panel, nor 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 date of the appointment letter and shall endure for a period Coterminous with the Existing Three-Year Panel Contract thereafter.

4.2 Notwithstanding the foregoing, 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 _____as more fully described in Annexure "A" hereto, as and when required.

5.2 In performing the Services established for this Service Level Agreement, the Service Provider undertakes to:

5.2.1 Timeously respond to the "Call Off Requests" 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 Do not collude with other service providers in responding to Sentech's requirements.

5.2.5 at all times carry out its duties and obligations in terms of this Agreement competently and professionally.

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.

5.3 The Service rendered by the employees of the 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 professionally 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.

6 RIGHTS OF SENTECH

Sentech reserves the right to:

6.1 Go outside the Service Level Agreement to source services that cannot be sufficiently fulfilled within this Contract.

6.2 Approach other service providers 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 "Call of Requests".

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 allow all service providers to provide services to Sentech.

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 based on the pricing model described in Annexure A. When Sentech wishes to acquire any of the Goods listed in Annexure A hereto, Sentech shall request the Service Provider via the "Call of Procedure" as described in Annexure A. The 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 :

8.3 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.

8.4 Payment will be made in accordance with the approved purchase order (PO). Any work performed outside of the PO without prior approval of the variation order will not be paid

8.5 Sentech will make no payment to the service provider due to delays caused by adverse weather, and the contractor shall claim for extension of time for the lost days, provided a proven record, e.g., rain gauge readings, etc.

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 willful and/or negligent action. However, any such damage shall be reported to Sentech in writing within 48 (forty-eight) hours of knowing 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.

12 DOMICILIUM CITANDI ET 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: _____

12.2 Any notice given by either party to the 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

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

12.2.2 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.

12.2.3 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 about such Data.

13.3 The Service Provider hereby warrants in favor 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, supplied 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. The Service Provider shall not commercially exploit them in any manner whatsoever.

13.5 The Service Provider further warrants that it 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 comply with the international best practice for the protection, control and use of Data.

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

14 WHOLE AGREEMENT

14.1 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.

15 VARIATION

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

16 RELAXATION

16.1 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.

EXECUTION:

THUS DONE AND SIGNED AT _____ ON THIS THE _____ DAY OF _____ 2025_ 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 _____ 2025_ IN THE PRESENCE OF THE UNDERSIGED WITNESSES.

_____

DULY AUTHORISED FOR AND

ON BEHALF OF _____

NAME:_____

DESIGNATION:_____

WITNESSES

1. _____
2. _____

ANNEXURE A

Scope of Services

I. Background

Sentech is a state-owned company and the largest distributor of broadcasting signals 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 is expanding its digital footprint by leveraging underutilized capacity at its own sites and those of partners across South Africa. Sentech anticipates erecting antenna support structures, in the form of freestanding structural steel towers/monopoles, to expand its digital footprint.

Sentech intends to source Contractors experienced in projects related to the supply and construction of freestanding structural steel tower/monopoles, for inclusion in a pre-qualified Contractors Panel.

II. Description of the services

Appointment of Additional Contractors to the Existing Panel of Pre-Qualified Service Providers for the Supply and Construction of Structural Steel Towers/Monopoles, for a Period Coterminous with the Existing Three-Year Panel Contract.

These services may include, but are not limited to, the following:

- The supply of a tower/monopole (standard pre-design by mast manufacturing company or design by Sentech-appointed Engineer), which will include manufacture/fabrication, delivery, assembly, erection, and certification
- The supply/construction of rapid deploy surface foundation/reinforced concrete foundations (standard pre-design by mast manufacturing company or design by Sentech-appointed Engineer), which will include materials, delivery, construction, and certification

III. Structure of the Service Level Agreement

The “Call of Procedure” will be issued as a Request for Quotation by Sentech’s Supply Chain Management department to service provider (s). A winning bidder will be awarded the work upon issuance of a Sentech Purchase Order.

IV. Changes to Critical Team Members

The service provider shall inform Sentech of any changes to critical team members, ie, Senior Construction Rigger, Senior Construction Foreman, and Construction Health and Safety Officer, before replying to a Request for Quotation. Sentech reserves the right to reject/query a change to a critical team member if the Team member falls outside the minimum requirements as described in the original Panel Tender.

V. Requirements

General Sentech requirements from the service provider. Specific works and contractual requirements will be described in the RFQ/contract documentation:

1. Service provider shall use their private transport to travel to and from sites. (**Sentech sites are situated on top of mountains and/or have access roads that require high ground clearance or 4x4 type vehicles to access the sites).** Site descriptions will form part of the RFQ documentation
2. The service provider shall use their own tools/plant for any work carried out on site.
3. The service provider shall allocate knowledgeable and qualified resources for the steel fabrication and site construction works
4. The service provider shall conduct material testing in accordance with the specifications and scope of work
5. The service provider shall deliver the required product within the timeframe stipulated in the RFQ/contract
6. The service provider shall submit all necessary documentation (pre-/post-project) as detailed/required by the RFQ/contract. Typical documentations such as public liability and works insurance, construction guarantees, documentation related to OHS requirements, etc, will form part of the requirement

VI. Pricing Model

The preamble to the pricing section of the RFQ defines the rules and assumptions for the RFQ pricing schedule.

VII. Invoices and Invoicing Procedure

Invoicing and the invoicing procedure are described on the Sentech Purchase Order issued by Sentech's Supply Chain Management department.

VIII. Limitations on the use of this Service Level Agreement

Should the appointed service provider(s) fail to deliver on a Sentech request within specified SLAs, Sentech reserves the right to go on the open market for the services required under this Service Level agreement. The work to be completed will be limited to the scope of work specified in the RFQ, and any variations or adjustments to that scope must be implemented only after Sentech's approval.

IX. Generic Tower Specification

Turnkey solution for the:

- The supply of a tower/monopole (standard pre-design by mast manufacturing company or design by Sentech-appointed Engineer), which will include manufacture/fabrication, delivery, assembly, erection, and certification
- The supply of rapid deploy surface foundation/reinforced concrete foundations (standard pre-design by mast manufacturing company or design by Sentech-appointed Engineer), which will include materials, delivery, construction, and certification

at various existing telecommunication sites around South Africa

TYPE OF STRUCTURE

Self-supporting (freestanding) structures with the following features.

Self-Supporting (freestanding) lattice tower structures:

- Triangular or square in plan
- Parallel or taper in elevation
- Tube legs, angle legs, or solid round legs
- Tube, angle, or solid round vertical/horizontal bracing members
- All tower members are hot-dip galvanized
- Face width according to height and load capacity
- Internal footrest platforms as required by OHS
- Internal or external safety climbing ladder as determined by plan dimensions and as required by OHS regulations
- Internal or external vertical cable ladder

- Rapid deploy surface foundation/reinforced concrete foundations

Self-supporting monopole tower structures:

- Circular in plan
- Parallel or taper in elevation
- Slip jointed/flange connected, parallel/tapered hollow, hot dip galvanized steel tubes of high-strength steel
- Diameter according to height and load capacity
- External safety climbing ladder as required by OHS regulations
- External vertical cable ladder
- Rapid deploy surface foundation/reinforced concrete foundations

APPLICABLE CODES AND STANDARDS

The design, fabrication, assembly, and erection of the self-supporting structures and the design and construction of the RC foundations shall be completed in accordance with the requirements and specifications of the following standards.

Design

- ANSI/TIA-222-H (Structural Standards for Steel Antenna Towers and Antenna Supporting Structures)
- SANS 10160 (Basis of structural design and actions for buildings and industrial structures)
- SANS 10162 (The Structural Use of Steel)
- SANS 10100 (The Structural Use of Concrete)
- SANS 10225 (The Design and Construction of Lighting Masts)

Fabrication/Construction

- SANS 2001-CC1 (Concrete Works – Structural Works)
- SANS 2001-CS1 (Structural Steelwork)
- AWS D1.1.10 (Welding Standard)
- SANS 50025 (Structural Steel Standard)
- SANS 121 and ISO 1461 (Hot Dip Galvanizing)
- Hot Dip Galvanizing Association of SA
- SANS 2001-DP3 (Cable Ducts)
- SANS 920 (Steel Bars for Concrete Reinforcement)
- SANS 2001-BE2 (Earthworks-General)
- SANS 12944 and ISO 12944 (Corrosion Protection of Structural Steelwork)
- OHS regulations

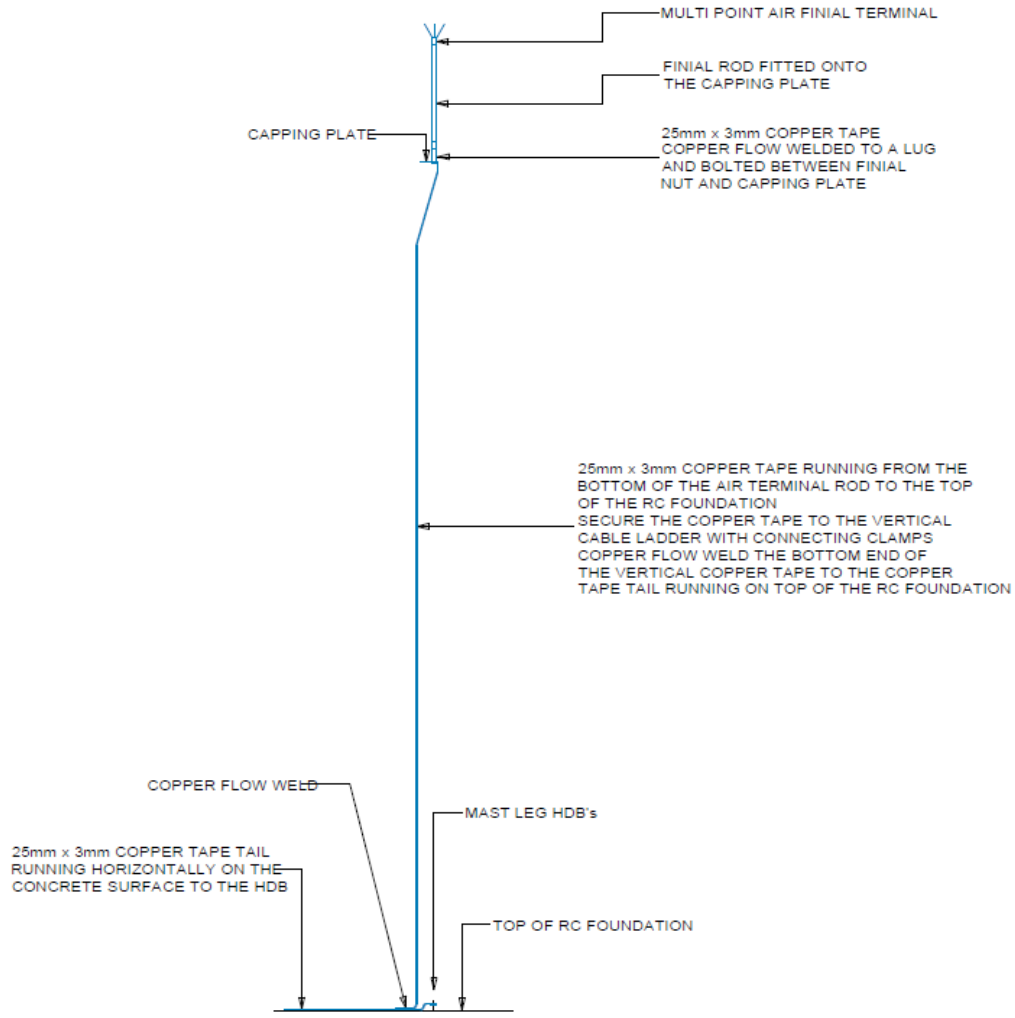
ANTENNA LOADING, SWAY, AND TWIST

Initial and future antenna-loading requirements will be incorporated into the self-supporting structure's design, as directed by Sentech.

The maximum sway and twist at the top of the self-supporting structures at the design wind speed is 0.5º.

SELF-SUPPORTING STRUCTURE ACCESSORIES AND ADDITIONAL SITE BUILD REQUIREMENTS

- A 1000mm long lightning finial and bracket installed at the top of the tower structure
- A 25x3mm copper tape running from the lightning spike on top of the mast to the base of the mast. 25x3 copper tape running from the earthing spike on top of the mast to the base of the mast. Secure the copper tape to the cable support ladder at max 1.0m intervals



AIR TERMINATION AND DOWN CONDUCTOR DETAILS

- Sub-foundation copper earthing mat and tail system formed from 25x3mm copper tape
- A steady burning, low-intensity, type A (minimum of 10 candela) duel AWL system complete with circuit breaker, photo cell switch, junction box, 3-core 2.5 mm2 shielded cable (AWL to junction box), mounting brackets, and stainless steel cable ties. The system must be configured for redundancy in accordance with the Civil Aviation Authority's requirements. An Electrical Certificate of Conformance is to be supplied for the installation
- Hot-dip galvanized structural steel vertical climbing ladder and safety cage
- Hot-dip galvanized structural steel footrests mid-way up the structure if climbing internally, and the structure serves as the safety cage
- 450mm wide hot-dip galvanized structural steel vertical cable ladder mounted to the structure. Cable mounting horizontals with a maximum of 1m vertical intervals

- 3no Ø110 Sub-surface uPVC cable ducts cast under/into the RC foundation, terminating under the bottom of the cable ladder and originating (sub-surface) at a point 1m from the foundation edge. Termination and origin ends are to be capped. Vertical change in direction by means of slow bends
- Rigid tower foundation anchor bolt template for setting out and mitigating misalignment during RC foundation construction
- A name plate fixed to the RC foundation indicating North, date of installation, and site co-ordinates

TOWER DESIGN AND DRAWINGS

The pre-designed self-supporting structures shall be designed by an ECSA-certified professional Structural Engineer using data supplied by Sentech and site-specific data for the site under consideration. The structure shall be designed to withstand the full expected dynamic loads, namely, antennae, feeders, wind loading, etc. Standardization of members and parts for the main structure should be considered to facilitate remote site delivery and ease of assembly.

Design data details are to be submitted, in the form of a design document, clearly indicating, but not limited to, the following:

- Design engineering information
- Site information
- International/SANS design codes and standards used
- Design software package used to model the design
- Site-specific wind load parameters
- Application of wind loads from antennas, members, cable ladder, cat ladder, etc
- Design loading
- Material strengths
- Design reactions at tower/foundation interface
- Certified by the Structural Engineer

A set of design drawings is to be included in the design documentation. The drawing pack should comprise, but should not be limited to:

- Fully dimensioned and annotated tower plan, elevation, and section general arrangement drawings

- Fully dimensioned and annotated tower plan, elevation, and section assembly drawings
- Fully dimensioned and annotated base plate, leg splice, gusset, etc, plan, elevation, and section detail drawings
- Fully dimensioned and annotated cat ladder, cable ladder, lightning spike, footrest, etc, plan, elevation, and section detail drawings
- Certified by the Structural Engineer

TOWER FABRICATION AND ERECTION

Tower Fabrication

- Steelwork to be in accordance with SANS 2001-CS1
- All steelwork to be hot-dip galvanized in accordance with SANS 121
- Welding to be in accordance with AWS D1.1.10
- Steel to be grade S355JR in accordance with SANS 50025
- Hot-dip galvanized grade 8.8 bolts, nuts, and washers
- Bracing connections to be welded or bolted (design dependent), but all site connections to be by bolt and nut
- Minimum bracing connection plate thickness design dependent
- Welds to be 6mm continuous fillet welds (U.O.N)
- All components to be free from burrs & sharp edges, etc
- Depending on the manner of procurement, fully detailed shop drawings are to be submitted to the Structural Engineer for approval before fabrication may commence
- Depending on the manner of procurement, the Tower structure is to be pre-assembled, complete with climbing ladder and cable ladder, for inspection by the Structural Engineer before galvanising
- No deviation from member sizes, dimensions, or setting out points unless permission has been obtained from the Structural Engineer
- All tower structure members shall be labelled in detail and as per the assembly drawings, especially where the method of assembling is not obvious
- On towers where duplex protection systems are required (hot dip galvanizing and paint coating):
    - Sweep blast and clean all fabricated steelwork (except nuts, bolts, and washers)
    - Painting shall take place as soon as possible after hot-dip galvanizing

- All shop painting and priming shall be done in accordance with the paint system manufacturer's requirements
- All mating surfaces must be unpainted (i.e., HD Galvanised only). The fabricator must mask off all mating surfaces, including those between steel sections and bolt heads/nuts, before painting. The masked off area must be bordered by a strip of primer coat at least 20mm wide
- Shop Painting of all fabricated steelwork (except nuts, bolts, and washers) to consist of two or three coats, depending on the paint product and severity of the environment. Coatings shall be applied within the dry film thickness range recommended by the manufacturer and as directed by the category for the environment of the site under consideration

- Hot dip galvanizing certificate of compliance to be submitted for all galvanized steelwork
- Quality control surface flaw detection test certificates to be submitted for fabrication welding
- Dry film thickness test certificates to be submitted for the shop-painted system
- Performance guarantees, offered jointly by the coating manufacturer and coating applicator, are to be submitted for the applied coating system

Tower Erection

- Tower structure members shall be handled with care during loading and off-loading operations to mitigate mechanical damage, and packed and strapped for delivery in a manner that prevents direct contact movement between tower structure members.
- Tower structure members shall be stored off the ground, on dunnage, and in a manner that mitigates mechanical damage during site operations.
- The tower structure shall be adequately supported during the construction process
- No welding or drilling of holes in the tower structure for rigging purposes
- The Contactor is responsible for the design of rigging procedures as well as the design and fabrication of all rigging equipment and temporary supports to the tower structure
- The Contractor must submit a detailed rigging and de-rigging methodology to the Design Engineer for their approval.
- Bolt lengths shall be such that with the locking device in place, a minimum of one complete thread shall protrude beyond the nut.
- Bolt threads shall protrude inside the structure only
- Non-shrink grout below tower base plates
- Certification of the site installation by the Structural Engineer to be submitted

- Where required, a temporary/emergency steady burning low intensity, type A (minimum of 10 candela) aviation warning light that shall remain operational on the new tower structure during the erection process at night or if power is not available
- Towers that are galvanised:
    - Repair all damage to the galvanized coating as a result of the delivery/erection process
    - Repairs by zinc-rich epoxy or zinc-rich paint are suitable for repairing galvanizing, as well as two-component, easy-to-use squish pack products, approved by and available from the Hot Dip Galvanizers Association of Southern Africa and all of its members
    - Site repairs should be limited to minor coating defects. The coating thickness on the renovated areas shall be at least 100 µm. The paint coating should overlap the surrounding zinc by about 5mm.
    - Products referred to as 'cold-galv' are not suitable and must not be used
- Towers that are galvanised and painted:
    - Site painting, in accordance with paint manufacturers' requirements/specifications, of all previously masked off surfaces and all bolts and nuts after the mast is erected
    - Site touch-up painting to repair all areas of coating damaged by the delivery/erection process

FOUNDATION DESIGN AND DRAWINGS

The pre-designed RC foundation shall be designed by an ECSA-certified professional Structural Engineer using design reactions at the tower/foundation interface, obtained from the tower design and the geo-technical data received, for the installation site under consideration, by a competent soil testing specialist. RC foundations for the tower structures shall be designed to withstand the complete (worst) expected dead and dynamic load combinations, transfer these loads from the tower structure via the tower/foundation interface, and safely transfer such loads, through the RC foundation, to the founding surface in a manner that does not exceed the installation site's safe soil bearing pressure.

Standard square pad foundation designs should be used for Tendering purposes.

- concrete characteristic 28-day strength: 30MPa
- nominal concrete aggregate size: 19mm
- minimum 75mm cover to main reinforcement

- 150kPa soil bearing pressures
- Top of foundation a minimum of 150mm protrusion above finished ground level
- Allowance for 3no Ø110 cable sleeves

The standard Tender foundation design shall be modified to suit the soil conditions found at the installation site once data from the site soil investigation has been confirmed.

Design data details are to be submitted in the form of a design document, clearly indicating, but not limited to, the following:

- Design engineering information
- Site information
- International/SANS design codes and standards used
- Design software package used to model the design
- Site-specific design reactions obtained from Tower design
- Site-specific geo-technical data
- Design loading
- Material strengths
- Certified by the Structural Engineer

A set of design drawings is to be included in the design documentation. The drawing pack should comprise, but should not be limited to:

- Fully dimensioned and annotated foundation plan, elevation, and section general arrangement drawings
- Fully dimensioned and annotated foundation reinforcement drawings
- Fully dimensioned and annotated anchorage detail drawings
- Certified by the Structural Engineer

RC FOUNDATION CONSTRUCTION, EARTHING MAT, AND SUB SURFACE CABLE DUCTS

RC Foundation

- Excavate to firm founding level, including a minimum of 0.5m of working space around the foundation, for the RC Foundation, and set aside material for use as backfill
- Cable duct trenching to be conducted in conjunction with the RC foundation excavation
- Earthing tail trenching to be conducted in conjunction with the RC foundation excavation

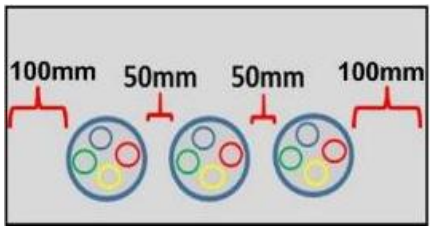
- All exposed excavation beds and areas to receive fill, to be ripped to a depth of 150mm, wetted and compacted to 95% mod aashto
- Structural Engineer to inspect and approve the foundation level before placement of the earthing mat and casting of concrete
- All loose material to be removed from the bottom of the excavation, and the sides thereof to be free of loose material
- In the event of over-excavation as a result of poor soil conditions, imported G4 fill material will be utilized and compacted in 150mm layers to 98% mod AASHTO, to bring the foundation up to the required level
- 50 mm layer of selected fill between concrete and earth mat, compacted to 98% mod AASHTO, to separate earth mat from RC concrete
- Formwork to be clean, straight, and rigid with tight joints that prevent any leakage of the concrete matrix
- Formwork to be designed to withstand all construction loads, to maintain the shape of the final structure, and to ensure the safety of construction workers
- Stripping of formwork and propping times in accordance with SANS/Structural Engineers requirements
- All encased sleeves and holding down bolts and plates to be adequately secured in place to prevent movement during the placement of concrete
- Holding down bolt threads to be taped up for the concrete placement process, and open ends of ducts to be capped
- Bending, fixing, and positioning of reinforcement to be in accordance with SANS/Structural Engineer/drawing requirements
- Reinforcement to be placed on approved reinforcing cover devices, staggered with a maximum spacing of 50d but less than 1000mm
- Structural Engineer to approve holding down bolt placement and reinforcement before casting of concrete
- Test results from 6No 150mm cubes per cast are to be provided. 3no cubes to be tested at 7 days and 3no cubes to be tested at 28 days
- Independent testing as above, in addition to the supplier's documentation, will be required if ready-mix concrete is utilized
- Concrete placement to be continuous
- Backup mechanical vibration equipment to be on site in case of failure
- Concrete to be cured in accordance with SANS/Structural Engineers requirements
- All vertical exposed concrete to have a smooth off-shutter finish

- Finished horizontal surfaces to be level/slightly sloped, to mitigate ponding of water, and to be wood float finished
- Exposed horizontal corners to have a 20x20mm chamfer
- Cover to reinforcement to be measured from the outside of the reinforcement
- Back-filling of trenches and foundation excavations in 150mm layers compacted to 95% mod aashto
- Excess material from the excavations is to be removed from the site and dumped at a municipal dumping site
- Completed foundation works to be certified by the Structural Engineer

SUB-SURFACE CABLE DUCTS

Each site installation shall have 3no Ø110 sub-surface uPVC cable ducts running from the equipment cabinet to the tower structure. Only a portion of the installation is required under the tower works. The tower works portion consists of excavating, laying, backfilling, casting under/into the RC foundation, terminating under the bottom of the tower cable ladder, and originating (sub-surface) at a point 1m from the foundation edge.

- Termination and origin ends are to be capped to prevent the ingress of soil and water during construction activities
- The buried endpoints are to be clearly marked on the surface for future location by the equipment cabinet installation team
- Vertical and horizontal changes in direction to be achieved by means of slow bends
- Minimum of 150mm vertical protrusion above the top of the RC foundation
- Trenching to be conducted in conjunction with the RC foundation excavation
- The minimum depth of the trench is to be 1000mm
- The minimum width of the trench is to be 630mm with spacing as depicted in the diagram below



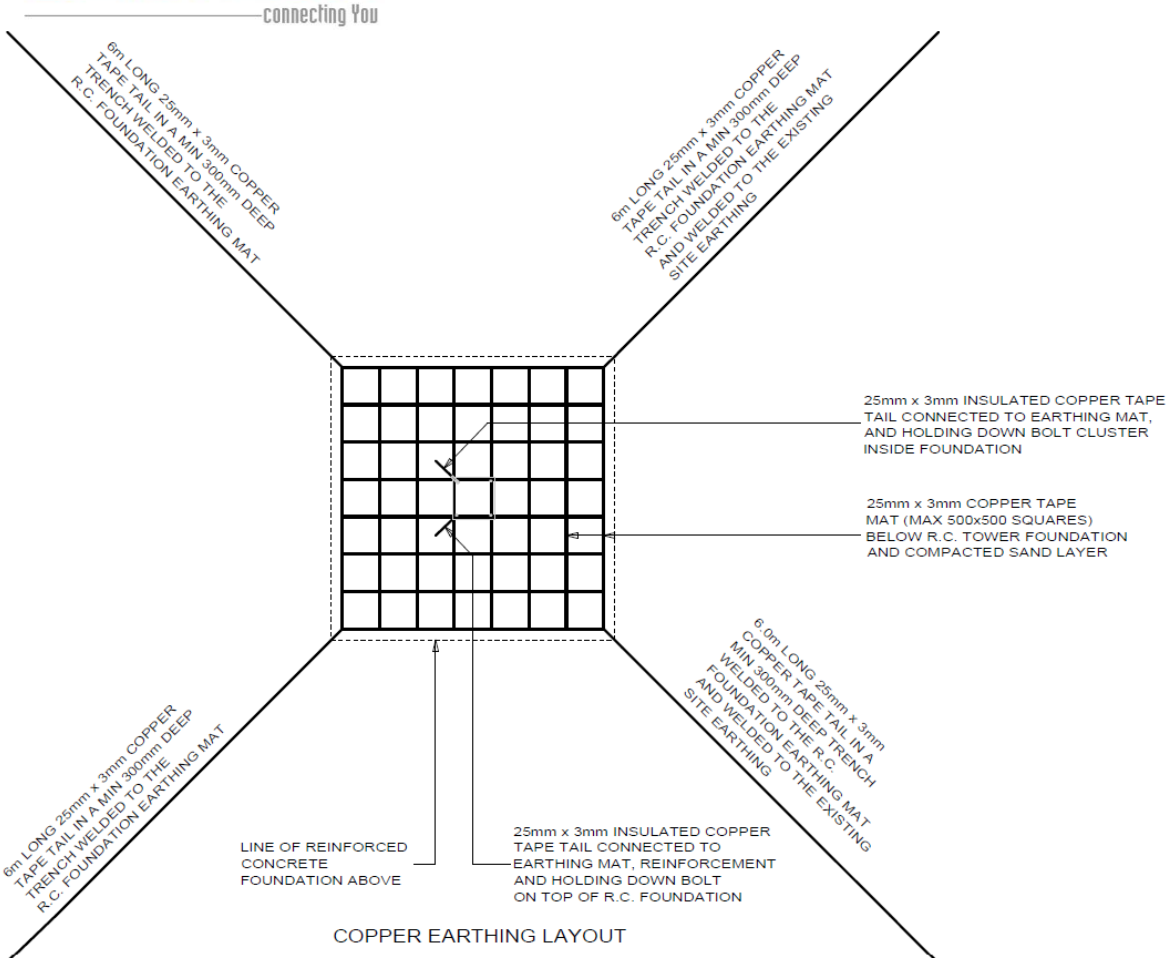
- A typical bedding, padding, and backfilling profile is shown in the diagram below

- Material used for bedding and padding to be of a granular, non-cohesive nature, graded between 0.6 mm and 13 mm. It is desirable to pass both bedding and padding through a sieve before putting them back in the trench
- Care shall be taken to place padding material simultaneously between and on both sides of the duct to prevent lateral duct movement during compaction
- Compaction of bedding and padding to be thoroughly and evenly executed using a hand tamper
- Material excavated from the trench may be used as backfill, provided that it contains no stones, trash, or organic matter that could potentially damage the ducts. Backfill material is to be installed in layers not exceeding 150mm, with each layer compacted before the next is added. Manual compaction to be performed until the ducts are covered by both a 150mm layer of padding and 300mm of backfill. From this point on, a vibratory plate compactor can be used
- The compaction of the final backfill layer shall be by means of a compaction machine and shall be compacted to a density higher than or at least equal to that of the virgin soil parallel to the trench
- Excess material from the excavation is to be removed from the site and dumped at a municipal dumping site
- After completion of the backfill, a DCP test is to be conducted, and the test results are to be submitted

Earthing Mat

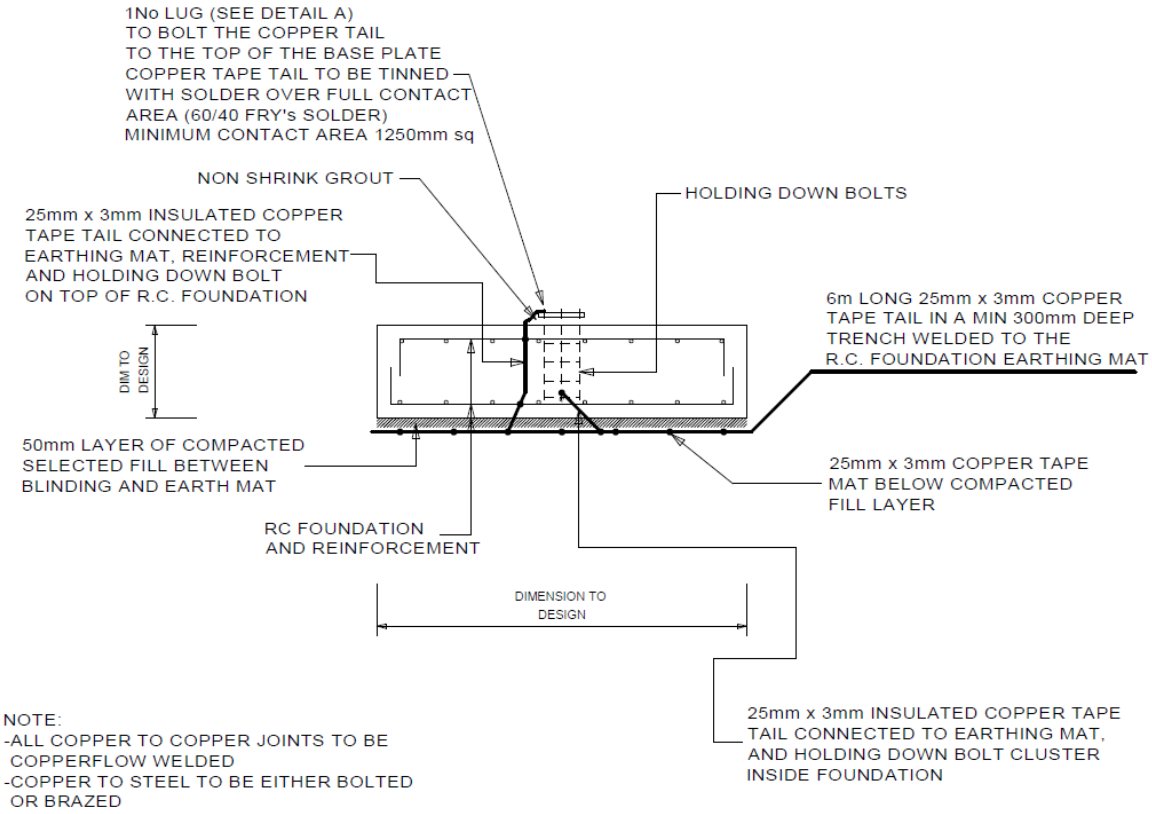
A typical copper earthing system consists of:

- 25x3mm copper earthing tape with copper flow or cad welded joints to form a square earthing mat with squares of maximum 500mm
- 4no 6000x25x3mm diagonal copper tape tails with one end copper flow or cad welded to the square earthing mat at corners, and the other end of two of the tails copper flow or cad welded to the existing site earthing. Length of tails
- 25x3mm insulated copper earthing tape (or insulated copper cable (70mm²) tail with one end copper flow or cad welded to the square earthing mat at a specific position and the other end connected to a holding down bolt, inside the foundation
- 25x3mm insulated copper earthing tape (or insulated copper cable (70mm²) tail with one end copper flow or cad welded to the square earthing mat at a specific position, connected to bottom and top reinforcement inside the foundation, and the other end welded to a lug which is connected to a holding down bolt on top of the foundation
- Earthing mat to be inspected and approved before placing a 50mm soil layer
- Resistivity and continuity test to be conducted, and a certificate to be submitted together with an Electrical Certificate Of Conformance
- Typical earthing layout

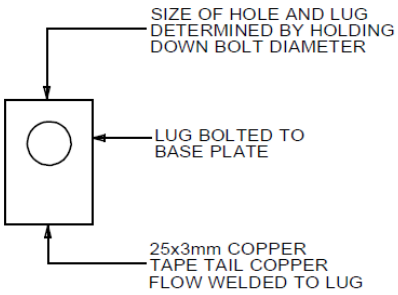


COPPER EARTHING LAYOUT

- Typical earthing elevation



TYPICAL FOUNDATION SECTION



DETAIL A