



## TENDER DATA

Project title:	Appointment of a Service provider for the Planning, supply, installation, and commissioning of 15m masts for Sentech.
Bid no:	<b>SENT-054-2023-24</b>

### 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 will procure 15m Masts as per the attached specification and installed at a contractually agreed price and delivery time on locations as provided.

The installation and commissioning of the Masts covered by this tender enquiry will be carried out by the bidder. Sentech Reserves the right to appoint one or more suppliers for the supply, installation, and commissioning of the masts.

***Bidders are required to complete Table A under Scope of Works to indicate which sites they are bidding for.***

### 2. SUBMISSION OF BIDS and CLOSING

This Bid closes at the stipulated date and time as stated in SBD 1 Notice and Invitation to Bid. Bids must be submitted by hand to the Bid Administrator at SENTECH, Octave Road, Radiokop Ext 3, Honeydew, Johannesburg.

Bidders that choose to submit their bid documents before the closing date and time may do so during working hours only (08:30-15:30).

It is the Bidder's responsibility to ensure that their bid submissions reach the Bid Administrator before the bid closing time as no late submissions will be accepted.

Telegraphic, telephonic, telex, facsimile, e-mail and late Bids will not be accepted. Proposals may be opened in public. Bidders will be advised of the outcome by letter, facsimile or e-mail.

This is a two-envelope system for Bid Evaluation. Bidders must submit their proposal and all supporting documentation in a sealed envelope, clearly marked as follows:

**Envelope One** "Original Technical Proposal" and one "Copy of Technical Proposal" together with a soft copy in PDF format of an electronic medium e.g. USB etc. The soft copy will consist of a single PDF document containing the complete response. The envelope must contain all information and documents relating to the Bid. (Refer to list of returnable documents).

**No Financial Information must be included in Envelope 1.**

**Envelope Two** "Original Financial Proposal" (Contract Date and Pricing schedule/schedule of rates as applicable) together with 1 copy of "Financial Proposal" together with a soft copy in PDF format of an electronic medium e.g. Compact Disk (CD), USB etc. The soft copy will consist of a single PDF document containing the complete Financial Proposal.

Bidders are required to place the sealed **Envelope 1** together **with** the sealed **Envelope 2** into one sealed envelope or container. The sealed envelope or container must be marked with the following information:

- **For Attention**
- **HEAD OF SUPPLY CHAIN MANAGEMENT**



- **BID REFERENCE NO:** ##
- **TECHNICAL AND FINANCIAL PROPOSALS**
- **INSERT CLOSING DATE AND TIME**
- **BIDDER'S NAME AND ADDRESS**

Bidders that combine their Technical Proposal with the Financial Proposal (or any financial information) will be automatically disqualified and not be evaluated further.

The financial proposal will only be opened and evaluated should the technical proposal be found to be responsive, being that the technical proposal has met the minimum technical evaluation criteria that are set out in the Bid Documents.

The Bidders shall insert a table of contents and bind (ring bind or similar method) the proposal documents and verify the page numbers, as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Bidders are required to complete and sign all the returnable documentation (refer to list of returnable documents) and initial all pages, drawings and brochures which are included in the reply as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Late submissions will not be considered.

### **3. SIGN AND INITIAL**

Bidders are required to complete and sign the Bid Forms where required and initial the bottom of all pages, drawings and brochures which are included in the submission as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Only original signatures will be accepted.

### **4. COMPLETION OF BID DOCUMENTS**

Bidders must ensure that they complete all sections of the Bid Documents as per the requirements in the Bid.

Bidders must use only the Bid documents provided by Sentech. Photocopying of the Bid document is permitted however Bidders must not retype or redraft the Bid documents.

### **5. COSTS OF PREPARING THE BID SUBMISSION**

Bidders shall bare all costs associated with the preparation and submission of the proposals. Sentech shall under no circumstances be held responsible or liable for any costs incurred during the bidding process.

### **6. ADMINISTRATIVE RESPONSIVENESS CRITERIA**

Bidders are required to ensure that they meet all the Administrative Responsiveness Criteria.

### **7. BBBEE CODES AT SENTECH**

Sentech complies with the codes of good practice as prescribed by the DTI, to advance Broad Based Black Economic Empowerment.



## 8. SUBCONTRACTING AS A CONDITION OF BID

The successful Bidder must subcontract a minimum of \_\_\_N/A\_\_\_% of the value of the contract to \_\_\_N/A\_\_\_ (specify the designated group targeted).

## 9. TRANSFORMATION PLAN

A transformation plan is a record of activities an entity intends to undertake to improve its BBBEE Level through Ownership, Management and Control; Skills Development; Enterprise and Supplier Development and Socio-Economic Development.

Sentech reserves the right to request a BBBEE transformation plan with clearly defined timelines and milestones if the recommended Bidder does not meet Sentech's transformation goals. These milestones must be achieved over the term of the contract. This transformation plan must be submitted within 10 working days from the written request, failing which Sentech reserves the right to withdraw its appointment of the preferred recommended Bidder.

## 10. LOCAL PRODUCTION AND CONTENT

In the case of designated sectors, where in the award of Bids, local production and content is of critical importance, such Bids will contain a specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

Does this requirement fall under any designated sector as prescribed by the DTI?		No
If yes, specify the sector		
Specify minimum threshold applicable		

\*Bidders must fill in the SBD6.2 for Local Content and Production

## 11. EVALUATION CRITERIA

The evaluation criteria are stipulated in 18 below. It is the Bidder's responsibility to ensure that it has responded to the evaluation criteria. Failure to meet the evaluation criteria will result in the Bidder not being evaluated further. Bidders must ensure that they have included all supporting documentation required to support their response to the Bid.

## 12. AWARD OF BID/S

Sentech may appoint one or more suppliers, in whole or in part, or not appoint any supplier/s at all, and/or cancel the bid in its entirety, at Sentech's sole and exclusive discretion, in order to satisfy various needs which may be identified, and to manage certain risks associated with the supply of goods or services specified in respect of the Bid.

## 13. BRIEFING SESSION

Should there be a compulsory briefing session for this Bid, Bidders must ensure that they attend the briefing session and sign the attendance register, as non-attendance or failure to sign the attendance register will automatically disqualify a Bidder from submitting a proposal for this Bid.

All questions raised by Bidders post the briefing session will be consolidated and shared with all Bidders at least seven (7) calendar days prior to closing.

## 14. CLARIFICATION



Enquiries related to Bid documents may be addressed to the Bid Administrator and Supply Chain Official as stated in SBD 1 Notice and Invitation to Bid.

## 15. BID EVALUATION METHOD

This Bid will be evaluated as described in the table below.

<p><b>A 80/20 system will be followed for Technical and Price offer</b></p>	<p><b>1. Stage 1 – Administrative Responsiveness Evaluation</b></p> <p>All the Technical Proposals will be evaluated against the <b>Administrative responsiveness requirements</b> as set out in the list of returnable documents.</p> <p><b>2. Stage 2 –Technical Evaluation</b></p> <p><b>Mandatory Evaluation Criteria</b></p> <p>Proposals that are administratively responsive will be evaluated against the Mandatory Evaluation Criteria set out in Section 18. Bidders must <b>COMPLY</b> with ALL Mandatory Evaluation Criteria. Bidders who fail to comply with all mandatory criteria will not be evaluated further.</p> <p><b>Functional Evaluation Criteria</b></p> <p>Proposals that are responsive and comply with the mandatory evaluation criteria will be evaluated against the Functional Evaluation Criteria set out in Section 18 Bidders must score 50 points (or more) out of a total 65 points available in the Functional evaluation criteria to qualify for further evaluation. . Bidders who fail to obtain the minimum point's score of 50 points or more will not be evaluated further.</p> <p><b>3. Stage 3 – Price and Preference</b></p> <p>Financial Proposals for Qualifying Bidders will be opened and evaluated. Bidder's financial offers and BEE certificates will be ranked according to price and preference points from the highest number of points to the lowest.</p>
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## 16. ADMINISTRATIVE RESPONSIVENESS REQUIREMENTS

To be administratively responsive, Bidders must ensure that they meet all the below mentioned criteria. Bidders that do not meet all the below mentioned criteria may not qualify to be awarded the Bid. Sentech reserves its rights in respect of the below criteria.

- Complete and return all documentation stipulated in the LIST OF RETURNABLE DOCUMENTS.
- All correspondence must be in English.
- Bidders must fill in all sections of this document (where applicable).
- **BLACK INK** must be used when completing the Bid documents.
- Bidders must use only the Bid documents provided by Sentech. Photocopying of the Bid document is permitted however Bidders must not retype or redraft the Bid documents.
- All corrections must be initialled. The use of corrective fluid is strictly prohibited.
- Bidders are required to fill in and sign the Bid Forms and initial all pages, drawings and brochures which are included in the reply as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.
- Bidders must complete an attendance register at each compulsory site meeting attended.
- Appointment of a Bidder will be subject to signing, declaration and submission of SBD 1, 3.1, 3.2, 3.3, 4, 5, 6,1, 6.2 8, and 9 depending on applicability.



- Complete and sign the Contract Data.
- Should this be a 2 envelope or 2 stage system, Bidders MUST separate the technical proposal from their financial proposal. The technical and financial proposals must be placed in two separate sealed envelopes.

#### **16.1 AUTOMATIC DISQUALIFICATION**

Sentech reserves the right to automatically disqualify Bidders from being awarded this Bid. The following will lead to automatic disqualification:

- Failure to submit a financial proposal, if required.
- The Bidder is or has been involved in any act of corruption or fraud or bribery or collusion or attempt to influence any employee of Sentech to award this Bid or any other Bid to it.

#### **17. TECHNICAL RESPONSIVENESS COMPLIANCE**

The Technical Evaluation will encompass evaluation of:

- Mandatory Criteria
- Functional / Technical Criteria

#### **18. TECHNICAL EVALUATION CRITERIA**

***Bidders are required to complete Table A under Scope of Works to indicate which sites they are bidding for.***

#### **Mandatory Criteria (Installer/ Supplier Specific)**

**The follow criteria are mandatory to ALL BIDDERS:**

Table 1. Mandatory Eligibility Criteria	Compliant (Indicate Yes or No)	Reference documentation
1. Bidder will be 100% responsible for the Design, Manufacture, installation, and commissioning of the structure		<ul style="list-style-type: none"> <li>Provide statement of commitment on Company Letterhead that the bidder conforms to the set-out requirements</li> </ul>
2. Bidder to ensure all OHS requirements are adhered to during the construction of the mast / towers and have a safety file on site		<ul style="list-style-type: none"> <li>Provide statement of commitment on Company Letterhead that the bidder conforms to the set-out requirements,</li> </ul>
3. 2SL CIDB Grading		<ul style="list-style-type: none"> <li>Valid Certificate or provide CRS number</li> </ul>
4. Certified to work, rig, and rescue at heights. (Valid Certificates for the team members working, rigging and rescue at heights)		<ul style="list-style-type: none"> <li>Valid Certificates for all members of the team that will be working, rigging and rescue at heights</li> </ul>
5. Letter of Good Standing from The Department of Labour (DOL) OR The Federated Employer's Mutual (FEM) OR The Rand Mutual Assurance Company Limited (RMA)		<ul style="list-style-type: none"> <li>Valid Documentation</li> </ul>
6. Proof of existing liability insurance cover		<ul style="list-style-type: none"> <li>Proof of cover from the insurer</li> </ul>
7. Provide proof that the masts were designed by an ECSA certified professional Structural Engineer.		<ul style="list-style-type: none"> <li>Proof that masts were signed off by an ECSA certified professional Structural Engineer AND</li> <li>Proof that the engineer is ECSA registered</li> </ul>
8. Project program with key tasks clearly defined and explained with critical path depicted. (The program must be presented in a Gantt chart format)  The project plan needs to include the following as minimum (Specification needs to be complied to). <ul style="list-style-type: none"> <li>Procurement timelines</li> <li>Delivery and Manufacturing timeline</li> <li>Transportation to sites</li> <li>Tower fabrication and erection</li> <li>Foundation construction, earthing mat, sub-surface cable ducts</li> <li>Sign off, certification, and acceptance process.</li> <li>Project governance</li> </ul>		<ul style="list-style-type: none"> <li>Supply project plan</li> </ul>

**NOTE: Bidders that does not comply with all the above criteria or do not present sufficient proof of compliance will not be eligible to be evaluated further**

### Functional Criteria

Bidders must supply proof of their capability and capacity to do the required work. Bidders will score points as indicated in the table below, based on proof supplied on the minimum criteria.

**Table 2:**

Functionality Criteria	Proof Required	Weighting factor
<b>1. Overall experience:</b>  Company must provide years of experience with regards to Structural Towers/Mast Construction projects.  Less than 3 years = 1 3years - 6 years = 5 7years -10 years = 10 More Than 10 Years = 15  (Please include list of project references in chronological order from the oldest projects to newest projects)	Complete table 1	<b>15</b>
<b>2. Track record:</b>  Company must supply contactable references/affidavit of Mast/ Tower construction projects of 15m and above. Attach proof of testimonial or reference letters on company letterheads or signed affidavit.  No NDA references will be accepted.  0 Masts/ Towers completed = 0 1 -7 Masts/ Towers completed = 1 8-14 Masts/ Towers completed = 5 Greater than 14 Masts/ Towers completed = 10	Attach testimonial letters OR Affidavit	<b>10</b>

Functionality Criteria	Proof Required	Weighting factor
<b>3. Experience of Project Manager</b>  Bidder to attach CV for Professional Registered Project Manager and with number years of experience in the construction of Structural Steel Mast/Towers  Project Manager will score a point for every year of relevant experience up to a maximum of 10 Points.	CV to be attached.	<b>10</b>
<b>4. Experience of Safety Officer</b>  Bidder to attach CV for Professional Registered Safety Officer registered with SACPCMP with number years of experience in the construction of Structural Steel Mast/Towers  Safety Officer will score a point for every year of relevant experience up to a maximum of 10 Points.	CV to be attached.  Valid SACPCMP Certificate to be attached	<b>10</b>
<b>5. Experience of Site Foreman</b>  Bidder to attach CVs for site foreman with number years of experience in the construction of Structural Steel Mast/Towers  Foreman/Supervisor with 8 years and more experience = 10 points Foreman with 3-4 years of experience - 5 points Foreman with 1-2 years of experience = 1points Foreman with less than 1 years of experience = 0 points	<b>CV to be attached</b>	<b>10</b>

Commented [CM1]: What's the minimum no. of years required?



Functionality Criteria	Proof Required	Weighting factor
<b>6. Construction Program</b>  Project program with realistic time frames, key tasks clearly defined and critical path depicted. (The program must be presented in a Gantt chart format)  Completion time for all 8 Sites:  4 Weeks= 10 Points  6 Weeks= 8 Points  8 Weeks= 6 Points  10 Weeks= 4 Points  12 Or more Weeks= 2 Points  <i>Take Note: Penalties will apply for late delivery as per Contract Data clause 22.</i>	<b>Program of works (Project Plan) to be attached</b>	<b>10</b>
<b>Total</b>		<b>65Points</b>

**Total minimum qualifying functional score is 50 points out of 65 points.**

## Scope Of Work

Sentech Requires the successful bidder to supply, install and commission 15m Masts as per the specifications set out below

Site Locations where masts need to be erected:

**Table A (Site locations)**

Site Name	Latitude	Longitude	Bidder to indicate which sites they are bidding for
Huguenot	-33.72825	18.97727	
Cookhouse	-32.74269	25.80725	
Pietermaritzburg	-29.61175	30.36936	
Gravelotte	-23.95725	30.61427	
Oberholzer	-26.34272222	27.39480	
Noupoort	-31.18083333	24.9505	
Sutherland	-32.395944	20.668083	
Pretoria North Sentech	-25.742389	28.531778	

## **Mast Specification 15M high ANTENNA SUPPORT STRUCTURE**

Turnkey solution for the:

- Design (standard designs supplied by mast manufacturing companies), manufacture, delivery, assembly, erection and certification of a 15m high structural steel antenna support structure
  - Design, construction and certification of the RC foundation structure for a 15m high structural steel antenna support structure
  - Ancillary site works
- at various existing telecommunication sites around South Africa

### **TYPE OF ANTENNA SUPPORT STRUCTURE**

15m Self-supporting (freestanding) structures with the following features will be considered.

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 hot-dip galvanized
  - Face width according to height and load capacity
  - Internal foot rest 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
- Self-supporting monopole tower structures:

- Circular in plan
- Taper in elevation
- Slip jointed, 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

### **applicable codes AND STANDARDS**

The design, fabrication, assembly and erection of the 15m self-supporting structure and the design and construction of the RC foundation structure 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 to be incorporated into the design of the 15m self-supporting structure are depicted in the table below.

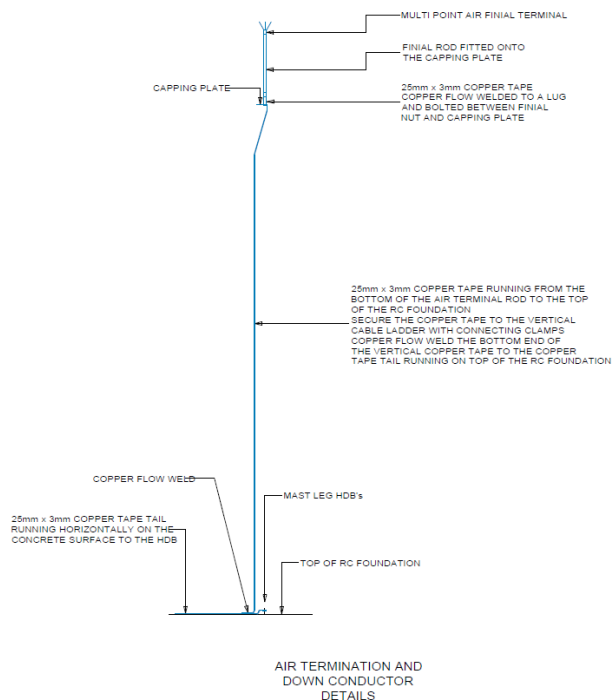
The maximum sway and twist at the top of the 15m self-supporting structure at the design wind speed is 0.5°.

Table of typical initial and future antenna loading requirements:

Typical Antenna Load									
Make	Description	Qty	Weight (kg)	H (mm)	W (mm)	D (mm)	Mounting method	Mid Antenna Mounting Position (m)	Antenna Cable No, Ø and Kg/m
	Sector Antenna	4	4.51 kg	500mm	300mm	75mm	Direct mount	14.5m and one to each quadrant, in plan	6mm x 12,6gram/ft
	Parabolic Dish	1	17	900mm	900mm	400mm	300mm Offset brackets, 1m long Ø80mm mounting pole	10m	10,29mm x 0,1kg/m
	Parabolic Dish	2	8	600mm	600mm	350mm	300mm Offset brackets, 1m long Ø80mm mounting pole	10m	10,29mm x 0,1kg/m

#### 15m 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 from the lightning spike on top of the mast to the base of the mast. 25x3 copper tape running from the 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



- Sub-foundation copper earthing mat and tail system formed from 25x3mm copper tape
- A steady burning low intensity, type A (minimum of 10 candela) dual AWL system complete with circuit breaker, photo cell switch, junction box, 3 core 2.5 mm<sup>2</sup> shielded cable (AWL to junction box), mounting brackets and stainless steel cable ties. System must be configured for redundancy operation as per the requirements of the Civil Aviation Authority. 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 foot rests 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 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 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 15m self-supporting structure shall be designed by an ECSA certified professional Structural Engineer using data supplied by Sentech and data specific to 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, for each 15m self-supporting structure deployed at each individual site, 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, for each 15m self-supporting structure deployed at each individual site, are to be included in the design documentation. The drawing pack should comprise of, 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, foot rest, 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 dependant) but all site connections to be by bolt and nut
- Minimum bracing connection plate thickness design dependant
- 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 manufacturers requirements
  - All mating surfaces must be unpainted (i.e. HD Galvanised only). Fabricator must mask off all mating surfaces including mating surfaces between steel sections and bolt heads/nuts prior to 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 Contractor 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 and must submit a detailed rigging and de-rigging methodology to the Design Engineer for his/her 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 small coating defects. The coating thickness on the renovated areas shall be a minimum of 100µm. 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/specification, 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 RC foundation shall be designed by an ECSA certified professional Structural Engineer using design reactions at tower/foundation interface, obtained from the tower design and geo-technical data obtained, by a competent soil testing specialist, for the installation site under consideration. RC foundations for the tower structures shall be designed to withstand the full (worst) expected dead and dynamic load combinations, transfer these loads from the tower structure via the tower/foundation interface and shall safely transfer such loads, through the RC foundation, to the founding surface in a manner that does not exceed the installation site safe soil bearing pressure.

Standard square pad foundation designs should be used for the purposes of the Tender.

- 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, for each foundation design deployed at each individual site, 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 the Tower design
- Site specific geo-technical data
- Design loading
- Material strengths
- Certified by the Structural Engineer

A set of design drawings, for each foundation design deployed at each individual site, are to be Included in the design documentation. The drawing pack should comprise of, 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

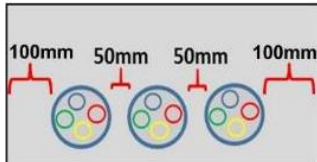
- Excavate to firm founding level, including a minimum of 0.5m of working space around the foundation, for the RC Foundation, and set aside material for use as backfill
- Cable duct trenching to be conducted in conjunction with the RC foundation excavation
- Earthing tail trenching to be conducted in 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 founding level before placement of earthing mat 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 to be utilized and compacted in 150mm layers to 98% mod aashto, to bring founding 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 which 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 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 suppliers 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 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 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 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 to be capped to prevent the ingress of soil and water during construction activities
- The buried end points 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 top of RC foundation
- Trenching to be conducted in conjunction with the RC foundation excavation
- The minimum depth of the trench to be 1000mm
- The minimum width of the trench to be 630mm with spacing as depicted in the diagram below



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



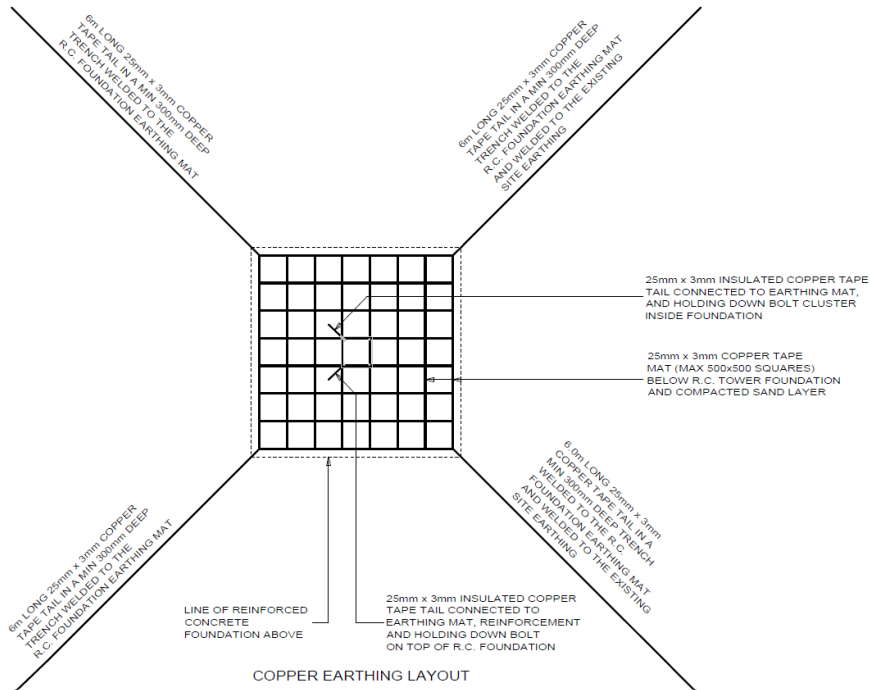


- Material used for bedding and padding to be of a granular, non-cohesive nature, graded between 0.6 mm and 13 mm. It is desirable to pass both bedding and padding through a sieve before putting it back in the trench
- Care shall be taken to place padding material simultaneously between and on both sides 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 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 to 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 site and dumped at a municipal dumping site
- After completion of the backfill, a DCP test is to be conducted and the test results submitted

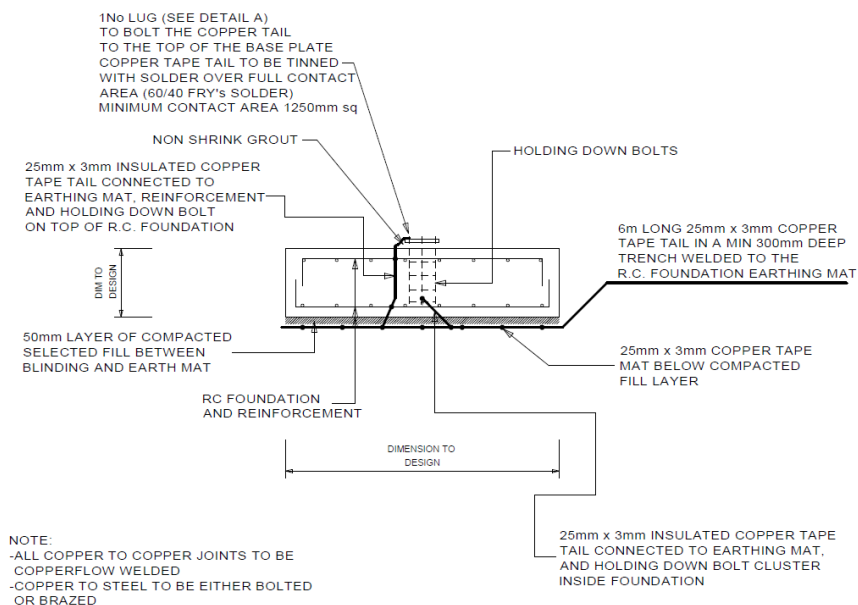
#### Earthing Mat

Typical copper earthing system to consist of:

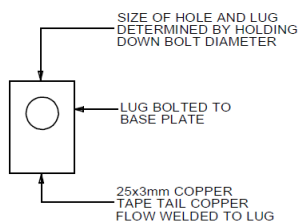
- 25x3mm copper earthing tape with copper flow or cad welded joints to form a square earthing mat with squares of maximum 500mm
- 4no 6000x25x3mm diagonal copper tape tails with one end copper flow or cad welded to the square earthing mat at corners and the other end of two of the tails copper flow or cad welded to the existing site earthing. Length of tails
- 25x3mm insulated copper earthing tape (or insulated copper cable (70mm<sup>2</sup>) 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 (70mm<sup>2</sup>) 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 50mm soil layer
- Resistivity and continuity test to be conducted and certificate to be submitted together with an Electrical Certificate Of Conformance
- Typical earthing layout



- Typical earthing elevation



TYPICAL FOUNDATION SECTION



DETAIL A

### 19. Evaluation of Price and Preference

This Bid will be evaluated on a points system based on weighted average score for Price and Preference as per Preferential Procurement Framework Act of 2000 (Act 5 of 2000).

### 20. Preference Point allocation – 80/20

Price / Preference	Weighting percentage
<b>Preference:</b>	<b>20%</b>
<b>Price:</b>	<b>80 %</b>
<b>Total must equal:</b>	<b>100%</b>

Sentech will award preference points as follows:

Goal	Points	Evidence required
Historically disadvantaged by unfair discrimination on the basis of Race	10	A valid BBBEE Certificate showing at least 51% black ownership
	5	A valid BBBEE Certificate showing at least 25.1 – 50% black ownership
	3	Black owned company showing at least 5 – 25% black ownership
	0	Below 5%
Historically disadvantaged by unfair discrimination on the basis of Gender (women)	8	A valid BBBEE Certificate showing at least 51% women ownership
	4	A valid BBBEE Certificate showing at least 25.1 – 50% women ownership
	2	A valid BBBEE Certificate showing at least 5-25% women ownership
	0	A valid BBBEE Certificate showing at less than 5% women ownership
Historically disadvantaged by unfair discrimination on the basis of disability	2	A doctor's note confirming disability
<b>Total Points</b>	<b>20</b>	

### 20. Price Calculation 80/20



The following formula will be used to calculate the points for price.

$$Ps = 80 \left[ \frac{1 - (Pt - Pmin)}{Pmin} \right]$$

Where:

Ps = Points scored for price of bid under consideration  
Pt = Rand value of bid under consideration  
Pmin = Rand value of lowest acceptable bid



## 22. Declaration of Authority

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this Bid Data is understood and all requirements will be adhered to.

Name of Bidder	Signature	Date	Designation

**TABLE 1: REFERENCES**

Please complete the customer reference table and relevant Contact telephone number and attach reference letters.

Customer		Service Provided	Contact Person	Contact no.	tel.	Contractual commencement date	Contractual completion date
1							
2							
3							
4							

5						
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<b>Name of Tenderer</b>	<b>Signature</b>	<b>Date</b>