SPOORNET

A division of Transnet limited

TECHNICAL

CONFIGURATION MANAGEMENT

SPECIFICATION CONTROL PAGE

DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS FOR ELECTRICAL EQUIPMENT SUPPLIED UNDER CONTRACT

Statement of authorisation:
There is no SABS specification available for similar material / equipment and as far as can be ascertained no other specification / standard suitably covers Spoornet requirements. The specification has been compiled in a manner which shall favour / encourage local manufacture of material / equipment to a maximum degree.

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Technical

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1.0 SCOPE

This specification covers Spoornet's requirements for drawings, catalogues, and instruction manuals and spares lists of electrical equipment supplied under contract.

2.0 DEFINITIONS

2.1 "Design drawings for approval" defines those drawings, which have to be submitted to Spoornet for approval prior to manufacture of equipment.

2.2 "Installation drawings" defines those drawings, which are required for the installation of the equipment.

2.3 "As Built drawings" defines those drawings, which reflect all the various approved designs, layouts, etc., of the actual final accepted state of the equipment.

3.0 STANDARDS AND SPECIFICATIONS

3.1 The following standards and specifications are referred to:

CEE.0012: Method of Tendering

SABS 0111: Engineering Drawings.

BS 308: Engineering Drawing Practice.

NRS 002: Graphical Symbols for Electrical Diagrams.

IEC 617: Graphical Symbols for Diagrams.

ASHRAE: American Society of Heating Refrigeration Air-conditioning Engineers Standard.

3.1.1 The following Spoornet standard (Electrical) symbol drawings are listed for reference:

CEE-PA-19: Symbols for Electrical Installations.

CEE-PA-42: Symbols for Distribution and Transmission Layout.

CEE-PA-101: Symbols for Air-conditioning installations.

CEE-TA-62: Standard Electrification Symbols.

3.2 Tenderers and contractors shall ensure that they work to the latest issues and amendments of the above standards and specifications.

4.0 APPENDIX

The following appendix forms an integral part of this specification:

Appendix 1:SCHEDULE OF REQUIREMENTS

This appendix calls for specific requirements applicable to the contract.

5.0 METHOD OF TENDERING

5.1 Tendering shall be in accordance with Spoornet (Electrical) specification CEE.0012.

5.2 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specification clause numbers indicating the individual statement of compliance or non-compliance.

5.3 The Schedule of Requirements, Quantities and Prices, Appendix 1 to this specification shall be fully completed by Tenderers. Failure to submit a fully completed sheet may preclude a tender from further consideration.

6.0 LANGUAGE AND UNITS OF MEASURE

Drawings and documents shall be prepared in English and the ISO unit of measure. Other offers will be considered on merit.

7.0 DRAWINGS

7.1 Drawings shall be generated in either Microstation or any CAD format, which can be read by Microstation, but offers on other media will be considered on merit.

7.2 Drawings shall be prepared in such a manner that they fully comply with the requirements of SABS 0111 and/or BS 308.

7.3 Symbols, with their explanations used on the drawings but not covered by the NRS 002, IEC 617, ASHRAE or Spoornet's symbol drawings shall be furnished i.e. then included on the drawing or supplied on a separate symbol list which is to be cross referenced to the drawing.

7.4 Where the publications referred to in clause 3.1 are at variance, the practice detailed in SABS 0111 shall take preference.

7.5 Drawings shall be prepared for ISO; "A" series size sheets and shall not be greater than A1 size except as detailed below.

7.5.1 Where under exceptional circumstances the nature of the work is such that a size A1 is impractical, then the AO size may be used.

7.5.2 Long drawings, where necessary for wiring/circuit diagrams, cable run diagrams, track layouts, etc., shall be prepared with widths equal to the widths of the "A" series sheets as required, but preferably not exceeding the length of an A0 sheet.

7.6 All interrelated drawings shall be clearly and adequately cross-referenced.

7.7 The Contractor hereby grants to Transnet a non-exclusive licence, in accordance with the provisions of section 22 of the Copyright Act, 1978;

7.7.1 to copy any plan, diagram, drawing, specification, bill of quantities, design calculation or other similar document made by the Contractor, other than under the direction or control of Transnet, in connection with the extent of work;

7.7.2 to make free and unrestricted use thereof for its own purposes;

7.7.3 to provide copies thereof to consultants to Transnet to be used by them for the purpose of such consultations and consulting services and-

7.7.4 to provide other parties with copies thereof for the purpose of tenders invited by Transnet.

7.7.5 Such non-exclusive licence shall apply *mutatis mutandis* to any plan, diagram, drawing, specification, bill and/or schedule of quantities, design calculation or other similar document made, other than under the direction or control of Transnet, by any principal or sub-contractor of the Contractor. The provisions of this clause shall not apply to documents made, in the case of plant or equipment to be supplied, for the manufacturing process of such equipment, but only to the equipment supplied itself.

7.7.6 Transnet shall make no separate or extra payment in respect of any non-exclusive licence granted in terms hereof.

8.0 INFORMATION REQUIRED ON DRAWINGS

8.1 A title block shall be provided in the lower right hand corner of each drawing, indicating:

8.1.1 Descriptive title.

8.1.2 Contractor's drawing number.

8.1.3 Space for Spoornet's drawing number (as requested in clause 7.7).

8.1.4 Place of installation.

8.1.5 Contract / Order number.

8.1.6 Contractor's name.

8.1.7 Signature or name of approving officer (as requested in clause 8.0).

8.1.8 Approval date.

8.1.9 Issue number.

8.1.10 Projection symbol for multi-view drawings, if required.

8.2 Successful Tenderers can obtain a copy of Spoornet's standard title block (Microstation or DXF formats) free of charge by contacting the Documentation Management section.

8.3 On wiring and circuit diagrams, the following shall be specified:

8.3.1 Cable and wire sizes.

8.3.2 Values of resistance.

8.3.3 Breaking capacity of switches.

8.3.4 Ratings of equipment.

8.4 On each assembly or sub-assembly drawing, the following shall be given:

8.4.1 Description of item.

8.4.2 Quantity required for assembly depicted.

8.4.3 Material manufactured from.

8.4.4 The classification of the material according to the relevant SABS specification or other specifications referred to herein.

8.4.5 The class or process of finish and/or coating.

8.4.6 Where special parts are specified, the name of the manufacturer, the size, capacity and the name or catalogue number of each part shall be furnished.

8.4.7 The mass of finished item depicted on the drawing.

8.4.8 Dimensions from a proper reference surface.

8.4.9 Dimension tolerances.

8.5 *On electrification drawings, the following shall be specified:*

8.5.1 Kilometre distances.

8.5.1.1 Kilometre distances of all new and existing masts measured from the preceding kilometre post.

8.5.2 Civil

8.5.2.1 The following civil information shall be shown:

8.5.2.1.1 Bridges.

8.5.2.1.2 Tunnels.

8.5.2.1.3 Pipes.

8.5.2.1.4 *Culverts.*

8.5.2.1.5 Subways.

8.5.2.1.6 Manholes.

8.5.2.1.7 Off track platforms.

8.5.2.1.8 Water-furrows along track.

8.5.2.1.9 Service roads that may influence electrification.

8.5.2.1.10 Level crossings.

8.5.2.1.11 All banks and cuttings.

8.5.2.1.12 Retaining walls.

8.5.2.1.13 Gradient markers and gradients.

8.5.2.1.14 Boundary fences (where relevant).

8.5.2.1.15 The beginning and ending of transition and circular curves and the radius.

8.5.2.3 On all station plans the beginning and ending of the platforms to be indicated, as well as all buildings and structures on the platform which may effect electrification. All secondary platforms/structures/obstacles, which may effect electrification, must also be shown.

8.5.2.4 All points with stock rail joints, intersection of centre lines and all ends of point positions to be shown, as well as the type of point, e.g. 1:9 LH (left hand.

8.5.3 Electrical

8.5.3.1 The following electrical information shall be shown:

8.5.3.1.1 New and existing masts and structures with appropriate sizes.

8.5.3.1.2 Span lengths.

8.5.3.1.3 Tension lengths.

8.5.3.1.4 Mast to track centres.

8.5.3.1.5 Tension type (spring or weight).

8.5.3.1.6 Transmission lines, Transnet and Eskom (Showing crossing heights above rail level).

8.5.3.1.7 Telkom lines.

8.5.3.1.8 Height gauges.

8.5.3.1.9 Power and Lighting kiosks.

8.5.3.1.10 Electrical cables nearer than 3,2m from track centre, as well as cables crossing the track.

8.5.3.2 Wire profiles showing clearances/wire heights for all transmission and telecommunication lines that cross the tracks shall be shown on the drawing at the point of crossing, in either tabular or graphic format.

8.5.3.3 Wire profile for all bridges and tunnels shall be shown on separate drawings.

8.5.3.4 Important information that shall be noted are:

8.5.3.4.1 Basic span.

8.5.3.4.2 Ruling contact wire height.

8.5.3.4.3 Reference to bonding drawings.

8.5.3.4.4 Wire sizes.

8.5.3.4.5 Types of structures and foundations.

8.5.3.4.6 Tables for traction and transmission line (Showing wire heights).

8.5.3.4.7 Dropper chart.

8.5.3.4.8 Overlaps.

8.5.3.4.9 Jumpers.

8.5.3.4.10 Staggering.

8.5.3.4.11 References to switching diagram drawings.

8.5.3.4.12 Any other relevant information.

8.5.4 Signal.

8.5.4.1 The following signal information shall be shown:

8.5.4.1.1 Signal gantries (showing direction of aim).

8.5.4.1.2 Independent signals (showing direction of aim).

8.5.4.1.3 Signal kiosks.

8.5.4.1.4 Telephones.

8.5.4.1.5 Signal relay rooms.

8.5.4.1.6 Radio repeater rooms.

8.5.4.1.7 Signal cables nearer than 3,2m from track centre, as well as cables crossing the track.

8.5.5 Electrification information must be clearly indicated on drawings (see also drg no CEE-TA-62 for Standard Electrification Symbols).

8.7 The successful tenderer shall obtain Spoornet's drawing numbers from the Documentation Management section of Spoornet well in advance in writing, wherein details of all relevant drawings, i.e. titles and makers numbers are quoted. Against this information Spoornet will allocate its own numbers for inclusion by the Contractor on the original drawings.

9.0 CERTIFICATION OF DRAWINGS

The contractor against a date to certify that the drawing has been checked and is correct in all respects shall approve each drawing. This also includes changes.

10.0 CHANGES TO DRAWINGS

Any drawing returned to the Contractor for changes shall be re-submitted to Spoornet within 21 days with the appropriate changes endorsed thereon.

11.0 SUBMISSION OF TENDER DRAWINGS

The Tenderer shall submit drawings of all major items of equipment with the tender. The drawings shall be sufficiently detailed (e.g. safety factors) to enable suitability of the design to be judged and to enable Spoornet to prepare a reasonably accurate estimate of the cost of maintenance.

12.0 DRAWINGS TO BE SUPPLIED BY SUCCESSFUL TENDERER

12.1 Two prints of each design drawing for approval to be submitted prior to commencement of work or manufacture of any equipment to Spoornet. This includes drawings of general layouts, cable routes, schematic diagrams, foundations, equipment etc.

12.2 Two prints of each installation and/or erection drawing to be submitted to Spoornet. This includes drawings of modular steel buildings, structures etc. and shall be delivered at the same time the delivery of the equipment commences.

12.3 The successful tenderer shall supply one complete set of approved (signed) "As Built" working drawings as well as the electronic files thereof. Drawings shall be fully dimensioned, fully detailed, clear and neat. The set shall comprise all electrical and mechanical drawings considered necessary by Spoornet and shall include drawings of all renewable parts or items. "As Built" drawings of all enclosures, structures and foundations shall also be supplied.

12.4 All relevant "As Built" drawings required shall be delivered to Spoornet within 90 days of completion of the installation and delivery of equipment.

12.5 Until all relevant drawings called for in the contract are delivered, the contract will be considered incomplete.

13.0 CATALOGUES

13.1 Tenderers shall submit a separate quotation for the supply of the itemised part catalogues when specified in the Schedule of Requirements. The size shall be A4 (297 mm x 210 mm). Consideration shall be given on merit of the supply of these catalogues electronically (PDF format).

13.2 The information contained in the catalogues shall be classified into convenient sectors and be indexed. Thumb tabs shall be provided for quick reference to sections. All apparatus shall be illustrated by means of photographs or detailed sketches on which both the parts and the catalogue numbers of the parts are clearly shown. Catalogues shall have exploded views of components for clarity where needed.

13.3 The following information shall be given in tabular form:

13.3.1 Designation of apparatus or item of equipment.

13.3.2 Description of part including information such as dimensions, sizes, resistance values, stranding, material, current ratings, etc.

13.3.3 Catalogue number.

13.3.4 Manufacturer's name.

13.3.5 "As Built" drawing and item number where applicable.

13.3.6 Quantity of parts required for each piece of apparatus.

13.3.7 Illustrating photographs or sketch number.

13.3.8 Nato registration where applicable.

13.4 In a suitable section of the catalogue the following information shall be given:

13.4.1 Index to "As Built" Drawings.

13.4.1.1 "As Built" drawing number.

13.4.1.2 Heading.

13.4.1.3 Parts shown on drawing.

13.4.2 Index to catalogue numbers.

13.4.2.1 Catalogue numbers in numerical order.

13.4.2.2 Catalogue volume number, where applicable.

13.4.2.3 Section in which part is listed.

13.4.2.4 Page number.

13.4.3 Special tools.

13.4.3.1 Designation and description of special tools.

13.4.3.2 Catalogue number.

13.5 Each volume shall be neatly bound in hard serviceable cover on which the contract numbers volume number and titles are printed. All the information in the catalogues shall be given in a clear legible manner. The catalogues shall include all items of equipment to be supplied by the successful tenderer.

13.6 *Catalogues shall be delivered before date of completion of the contract.*

14.0 INSTRUCTION MANUALS

14.1 Tenderers shall submit a separate quotation for the supply of the number of copies of instruction manuals specified in the Schedule of Requirements. The size shall be A4 (297 mm x 210 mm). Consideration shall be given on merit of the supply of these catalogues electronically (PDF format).

14.2 The successful tenderer shall submit draft instruction manuals for approval prior to final printing/compiling and delivery.

14.3 The approved instruction manuals shall be delivered before commissioning the equipment. If this cannot be met, the successful tenderer shall furnish at least three copies of preliminary instruction manuals, suitable for the use of maintenance staff, until the final instruction manuals are to hand (which shall be before the date of completion of the contract).

14.4 The construction, method of operation and purpose of all items of equipment shall be fully explained by means of descriptions and photographs, sketches, drawings or circuit diagrams showing all details.

14.5 The information contained in the instruction manuals shall be classified into convenient sections and indexed. Where multiple models are produced each model shall be described in a separate section in such a manner that models not applicable can be omitted. Where possible the sections shall be subdivided as follows:

14.5.1 Installation and commissioning.

14.5.2 General description and method of operation.

14.5.3 Maintenance and inspection.

14.5.4 Overhaul and repair of equipment.

14.5.5 Technical and maintenance data.

14.5.6 Test procedure flow charts.

14.5.7 Fault finding and trouble shooting.

14.6 The method of calibrating, setting or adjusting all equipment requiring such attention shall be described and where necessary illustrated. The necessary data shall be given in each case to enable the equipment to be checked by measurement if required.

14.7 Full step-by-step instructions regarding the servicing and repair of the equipment shall be given together with all the necessary data such as dismantling and assembling procedures, working clearances, tolerances, limits, fits, maximum permissible wear, recommended lubricants, use of special tools, insulation and winding data, spring pressures and tensions, brush data, fuse data, etc. Recommended servicing/rework/replacement of parts frequencies shall also be included in the maintenance and inspection section of the instruction manual.

14.8 Any delay in delivery of the complete supply of satisfactory instruction manuals/preliminary manuals as provided for in this clause, will subject the Contractors to a deduction from the contract sum, of a penalty as defined in the tender, counting from the specified delivery time until such time as the said manuals are delivered.

15.0 COMBINED DOCUMENTS

If desired the catalogues and instruction manuals specified in clauses 12.O and 13.O may be combined into single volumes. Tenderers shall state whether or not it is their intention to do so. In this case the delivery shall be as specified in clause 13.3, alternatively the conditions described in clause 13.8 applies.

16.0 SPARES LIST

16.1 To enable Spoornet to catalogue and timeously acquire all spares required, the following information shall be submitted before commissioning of equipment:

16.1.1 An itemised schedule of the spares (with reference to alternatives) which are recommended for normal maintenance purposes.

16.1.2 The quantity recommended to be held against each item on the spares list and where sets are supplied, the types and quantity per type to make up a set.

16.1.3 A full and complete ordering description and number of each individual spare with drawing number if relevant.

16.1.4 Where the ordering description and number differs from that of the original manufacturer's catalogue, description and number, the original manufacturer's name, description, type and ordering number shall be listed as well as all other relevant data available.

16.1.5 The national stock number - Nato - number of each spare where the particular spare was imported from a Nato country and where a national stock number was allocated.

16.2 Initially the spares list containing the above information will suffice, but this list shall not in any way replace or supersede the spare parts catalogue mentioned in clause 12.O.

17.0 PACKING OF DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS

All items shall be packed in such a way that they are received in good condition.

18.0 SUBSTITUTION

This specification replaces specification CEE.0224.94

TENDERER'S SIGNATURE: _____

DATE: _____

FOR SPOORNET:_____

GRADE: _____

END

SCHEDULE OF REQUIREMENTS

FOR SPOORNET:_____

GRADE: _____

END