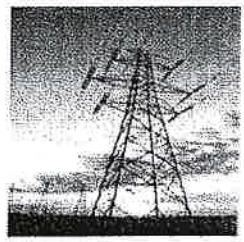
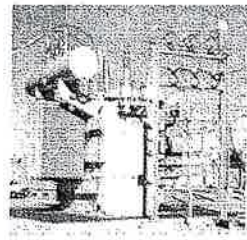
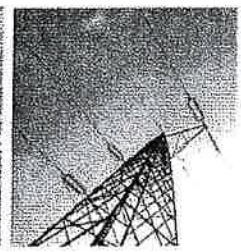
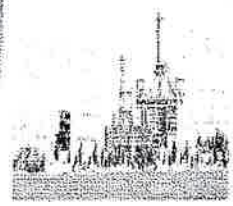
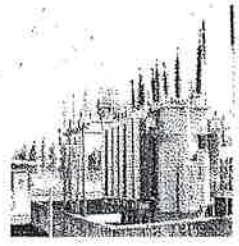
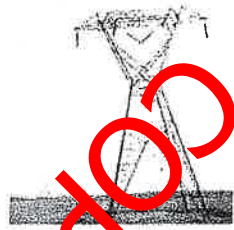
ANNEXURE. B.






TRANSNET

Port of East London: Graving Dock
Substation Refurbishment

Technical Specification: 400V Induction
Motor and Gearbox

Contents

1. GENERAL DESCRIPTION OF WORKS

This part of the specification provides the details of the mechanical equipment and services required for the project including the replacement of the two high voltage pump motors with low voltage motors, fabrication of new components, strengthening and replacement (where necessary), design, supply, manufacture, installation, testing and commissioning of existing and new components of the Mechanical Plant at the dry docks at Port of East London.

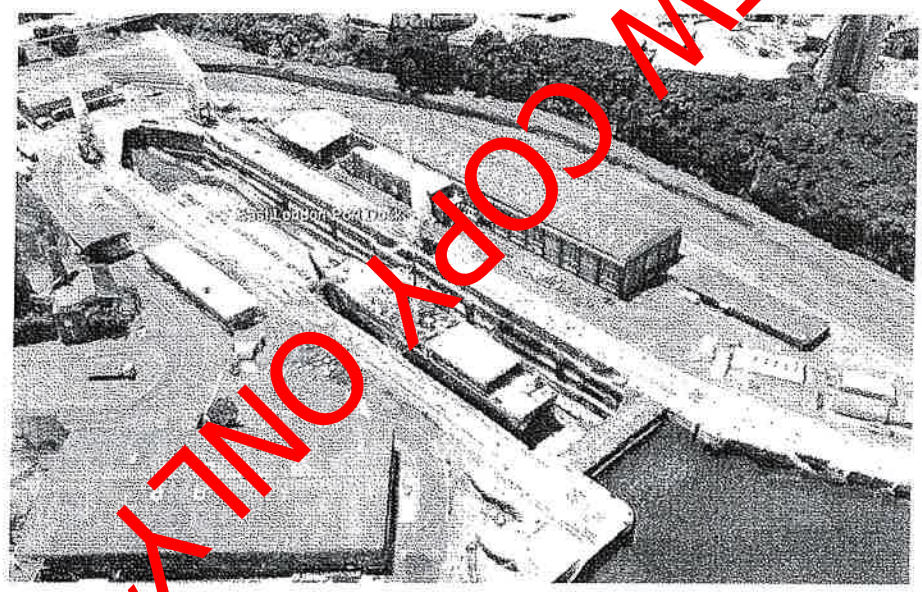
Currently there are two dry dock pumpsets, both supplied from the 6.6 kV sub-station, with the following characteristics:

- Synchronous motors of 283 kW each with rotational speed of 375 rpm (16-pole). The approximate weight of each motor is 9.2 tons.
- Soft starting by rotors resistance banks.
- Gwynne vertical spindle centrifugal split casing pumps with 914.4 mm suction and discharge nozzles.

The two main pumps can be operated single or in parallel configuration. Each main pump, when running alone, is capable of emptying the dock within a period of eight hours and when running together in parallel the two pumps are capable of emptying the unoccupied dock within eight hours to allow maintenance personnel to perform repairs and refurbishment to a vessel.

2. SITE

The Drying Dock is located at the Port of East London in the Eastern Cape Province at coordinates 33°01'17.00" S and 27°53'48.88" E at sea level.



3. CLIMATE

East London has cold winters and mild summers. Average winter and summer temperatures are at 10°C and 27°C respectively. The site falls within the summer rainfall district and has an average annual rainfall of ± 590mm.

4. SCOPE OF WORKS

This part of the specification provides the details of the mechanical equipment and services required for the project.

The detail specification may also include the description of items which form the basis of payment in the schedule of quantities.

The scope of work covered in this specification is for the design, supply, delivery to site, installation, testing and commissioning, hand-over and 12 month guarantee of the mechanical equipment. The work to be performed includes the replacement of the existing 6.6kV switchgear and 16-pole synchronous motors with low voltage 400V switchgear and induction TEFC motors. Replacement of both the main pumps is not part of this contract. The electrical portion of the scope of works will be done by others.

The scope of work for the mechanical portion of the works shall include the following:

- Removal of pumphouse roof and existing motors at site (done by the client).
- Design, supply and delivery of two adaptor plates to fit to existing motor steel support baseframe to accommodate new motor and reduction gearbox.
- Design, supply and delivery of two gearboxes of the vertical parallel configuration, single reduction.
- Design, supply, delivery and installation of two flexible type couplings.
- Supply, delivery and installation of two new 400V, 50 Hz TEFC motors.

The Contractor shall submit all calculations on motor and gearbox sizing selection based on the duty of the pump to the Engineer for review and approval before placing orders on any equipment. This has been allowed for in the bill and the Contractor should have priced for this item.

4.1 Removal of Existing Motors

Removal of the super structure roof and existing motors will be done by the Client using their own lifting equipment.

4.2 Adaptor Plates

After removal of the existing motors by the Client, the Contractor shall allow for at least two days site visit to perform a detail measurement of the existing motor steel support baseframe. These baseframes are of robust construction and was designed to carry the full load of the 9 ton synchronous motors. The baseframes consist of lower and upper parts with the motor secured to the upper part. It should be noted that the tender drawings of the upper part are only for tendering purposes and it stays the responsibility of the Contractor to confirm the actual dimensions on site before commencing with fabrication of the new adaptor plates.

The Contractor will require these measurements to manufacture, supply, deliver and install two newly manufactured adaptor plates that will precisely fit to the dimensions of the existing baseframe and the newly installed gearbox and motor. Modifications to the existing baseframes will not be allowed except with prior approval by the engineer should it deemed to be a requirement.

The Contractor shall be responsible for the design of the adaptor plates and shall submit the design calculations to the Engineer for approval prior to fabrication. The design of the adaptor plates shall take into consideration all holding down torques and vibrations exerted from the motors and gearboxes onto the plates.

The Contractor shall take into consideration flatness level of the baseframe and design the adaptor plates accordingly to ensure true alignment between the output shafts of the gearboxes and pump shafts

The adaptor plate shall be of rigid construction with sufficient thickness to support the full load of the motor and gearbox under both static and dynamic conditions without causing any resonance resulting into damaging of any installations. Welding shall in general comply with Clause 5.5 and the Contractor shall allow for non-destructive testing to be done on welds.

The plates shall be accurately and neatly machined to precise tolerances with no sharp edges or burrs and all bolt holes drilled at precise dimensions and positions to ensure accurate fitment with the existing support baseframe and newly installed gearboxes. The Contractor shall for ease of installation allow for lifting eyebolts at appropriate points to ensure that the plate is at level when lifted and lowered into final position. The eyebolts shall be of suitable sizes to accommodate the dead weight of the adaptor plate.

Mild steel for welded, riveted and bolted construction shall comply with BS EN 10025 for weldable structural steel. The minimum required grade of mild steel material shall not be inferior to Grade S355JR. The Contractor shall submit material certificates from the steelmakers to demonstrate material selection.

The Contractor shall include for all fasteners (bolts, nuts and washers) of same dimensions to match the existing baseframe.

The Contractor shall take all necessary steps to allow for all consumables to ensure that the seated contact areas between baseframes and adaptor plates are clean before fitment.

The Contractor shall make provision for the transport of the adaptor plates to site, offloading from the truck and placed into final position using suitable crane and rigging and lifting equipment. All rigging and lifting equipment shall be certified safe to be used by the Contractor. The Contractor shall make the necessary arrangements to hire a reputable crane company with all certificates and roadworthy papers to be valid and available to the Engineer on request. The Contractor will be responsible for the fastening of the adaptor plates to the upper baseframes.

4.3 Gearboxes

4.3.1 General

The Contractor shall design, supply and delivery two gearboxes to site. The responsibility lies with the Contractor to arrange for transport of the units to site, offloading and placing in final position using a suitable crane. The Contractor will be responsible for the alignment and fastening of the units onto the adaptor plates.

The turning gear with driving motor shall be supplied along with the gearbox. The motor shall be mounted on the high speed shaft (input shaft) of the gearbox. The Contractor is allowed to have the motor/gearbox assembly delivered to site as a combined unit.

4.3.2 Design Parameters

The gears shall be designed to meet the following requirements:

- Input speed : 1490 rpm
- Output speed : 375 rpm
- Output torque : 6876 Nm (based on pump duty)
- Service factor : 2 (based on input power)
- Load of Inertia (MR2)* : approx. 70 kg.m2 (without water)
- Load of Inertia (MR2)* : approx. 82.6 kg.m2 (incl. water)

- Gearbox efficiency 98.5% (at least)

*It should be noted that the calculated value for the total moment of inertia is based on dimensions from drawings on existing rotating element including the coupling and assumptions on impeller geometry. The total value of 82.6 kg m² could therefore be conservative but should be confirmed by the Contractor's calculations.

The Contractor should inter alia take into account inertia of selected gearbox and coupling to ensure that the selected motor inertia is sufficient.

4.3.3 **Technical Requirements**

The selected gearbox shall be of compact design and suitable for vertical motor/pump installation, i.e. single reduction parallel shaft with vertical offset slow speed stage gear pair with case housing split in the horizontal plane of the shafts. The joined faces shall be accurately machined to prevent any oil leakages.

The direction of rotation of output shaft as viewed from top looking at the shaft end shall be clockwise. Gearbox housings shall be of suitable rigid construction and shall be cast to GI 260 and comply with BS EN 1561 or equivalent. No fabricated housings are permitted. Split type housings are preferred. Housing shall be supplied complete with inspection covers to facilitate maintenance.

Housing shall incorporate lifting facility points to allow for the easy and safe handling of the unit with the motor in situ. The housing shall be equipped with a breather, magnetic drain plug and oil refilling plug which shall be easily accessible above the mounting plate to facilitate easy oil changes. Breather shall eliminate the ingress of dust and moisture during stationary and operational conditions.
A vertical sight glass shall be offered to allow for visual inspection of the oil level during stationary and operational conditions. The sight glass shall be installed as not to allow for accidental damage during transport, installation, storage and operation. A dipstick too shall be offered as standard, this dipstick shall be of threaded type and to be sufficiently hand tightened to prevent leaking. High and low oil levels marks shall be indicated on both the sight glass and dipstick.

Gearing shall be selected in accordance with AGMA 6013-A06, gearing shall be of helical type and shall be manufactured from alloy steel and shall be thoroughly hardened prior to grinding. No worm gears will be accepted. Gears that are cut from special alloys shall not cause galvanic or chemical reactions between the gears and the gearbox shafts.

Mechanical service factor shall be a minimum of 2 based on motor nameplate installed power.

Gear unit shall be selected to transmit stalled torque conditions produced by the motor.

Thermal rating shall be a minimum of 1.0 based on motor nameplate installed power and speed. The normal maximum operating temperature of the gearbox under full load shall not exceed 90 °C in maximum ambient temperature of 40°C. Solar irradiation can be ignored, assume sea level altitude.
High speed shaft fan cooling is permitted should it be a requirement, but no external cooling in any form is permitted.
Mineral oils with extreme pressure additive shall be used and a list of suitable lubricants shall be supplied by the Contractor in the Operation and Maintenance Manuals.

For greased components, grade shall be in accordance with manufacturer's recommendations.
The bearings shall have a minimum life with at least 100,000 hours based on motor nameplate installed power and speed at continuous running conditions. Bearing life shall be calculated in accordance with ISO 281, no modification factors may be used, assume all life factors to be equal to 1. Bearings shall be of roller type and conform to ISO designation and shall be suitable for shaft rotation in both directions.

The bearings of the input shaft of the gearbox shall be designed to take the weight of the motor rotor while the bearings on the output shaft to take the weight of the pump shaft with impeller. The dead weight of the pump shaft complete with impeller is estimated to be 1345 kg. Output shaft design shall be of adequate design and must allow for external radial and axial loads inducted by the application.
Acceptable brand bearings shall consist of SKF, FAG, NSK or NTN only.

Seal design shall be of "taconite" type design and shall consist of a lip seal and a greased purged labyrinth as minimum. Gearbox shall not leak or "sweat" oil during operation or stationary conditions. Seal material shall be fluorocarbon rubber (Viton type).

Protection devices shall be fitted to each of the gearboxes, i.e. PT100 bearing temperature sensors (one for input shaft and one for output shaft) and one PT100 for the oil temperature.

Each gearbox will be fitted with a nameplate showing at least the following information:

- Gearbox type or model number
- Serial number
- AGMA rating
- Nominal ration
- Approximate oil quantity required

The successful tenderer shall keep suitable records accessible from the serial number which will contain at least:

- Date of manufacture
- Details of test runs
- List of part number used in the assembly
- Proof from SANS that the bidders system conform to SANS ISO 9001 will be favoured. Proof of experience in the particular application shall be given by way of a reference list.

Gearboxes shall be tested in the factory subjected to no-load run for a period of at least 3 hours before despatch to site. Gearboxes shall be guaranteed for minimum operating hours of 20,000 from date of commissioning the gearboxes at site.

The Contractor shall supply catalogue of the gearbox proposed with his offer for valuation purposes.

4.4 Coupling

The existing couplings are of the rigid flanged type consisting of two identical halves bolted together and keyed to the shafts. The Contractor shall be responsible to remove the existing couplings and replace with new suitable couplings.

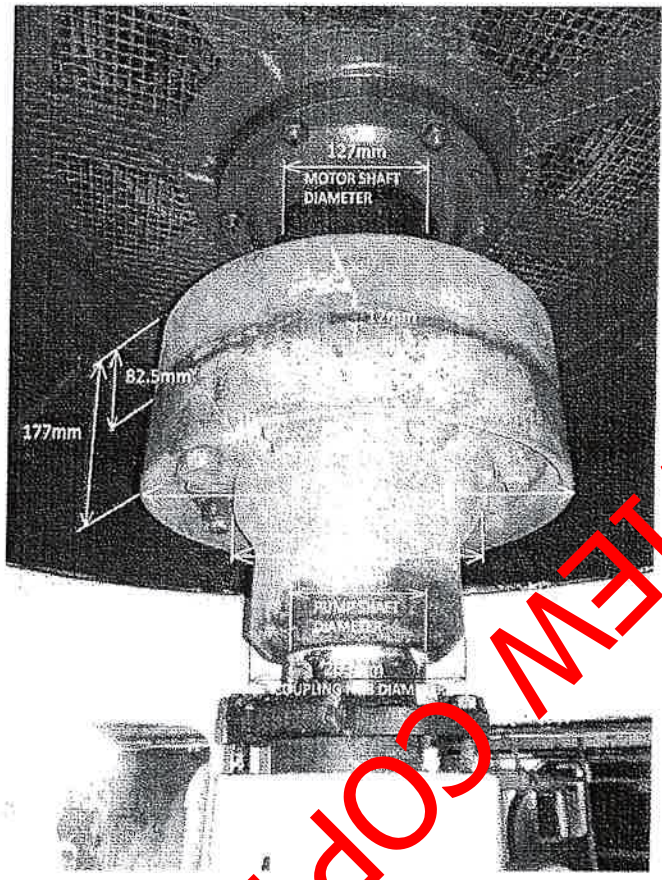
The Contractor shall supply, deliver and install two suitable flexible couplings suitable for vertical applications to fit with the output shaft of the gearbox and existing pump shaft. The couplings shall make provision for minor misalignment of shafts only and shall tolerate minor relative axial movement between shafts. Flexible couplings shall dampen the effect of shock loadings and cyclic fluctuating loads. Energy dissipation in the flexible elements of the couplings shall contribute to the dampening of torsion vibrations. Couplings shall be installed and adjusted strictly according to the supplier's instructions. Clearance between coupling flanges shall be carefully set in all planes/axes.

The Contractor shall confirm the exact pump shaft diameter and dimensions of the keys where the new couplings are to be fitted. The Contractor shall confirm with both pumpsets the gaps required between the gearbox output shaft and pump shaft to size the lengths of the gearbox output shafts accordingly to ensure that it fits perfectly with the selected coupling.

The Contractor shall be responsible for accurate alignment within the allowable tolerances of the coupling, which shall be witnessed by the Engineer. A certificate shall be issued by the Contractor demonstrating that the vibration readings and alignment are within acceptable tolerances and that the machine is safe to be operated.

The couplings shall be of flexible type and be maintenance free. The coupling shall be adequately rated for start-up and nominal load conditions.

The Contractor shall supply catalogue of the coupling proposed with his offer for valuation purposes.



Existing coupling dimensions between pump and motor (vertical installation)

4.5 Electrical Low Voltage Motors

4.5.1 General

The Contractor shall supply, deliver and install two three phase squirrel cage induction motors. The motors shall comply with the SANS 1804 part 1 and 2 and relevant parts of SANS 60034 standards.

Motors shall have a maximum continuous rated output not less than 10% above the maximum operating load, after site derating.

Motors shall be offered as a separate line item within the formal quote and shall be a Type Tested standard product design, from a recognised electric motor manufacturer with an accredited Quality Management System to ISO 9001 or equivalent. Motor brand and specification shall be stipulated in the offer and data sheets.

The Contractor shall make provision for the transport of the motors to site, offloading and placing into its final position using a reputable crane company. The Contractor will be responsible for the alignment and fastening of the motors onto the gearboxes.

4.5.2 Design Parameters

Motors offered shall be suitable for vertical installations and be flange mounted type to allow fixing directly onto the selected gearbox casings. The motor drive shaft shall be of sufficient length and diameter to accurately fit directly into the pinion gear. The turning gear driving motor shall be totally enclosed fan cooled type (TEFC) with the following requirements:

- Output rating : 315 kW
- Voltage : 400 V
- Frequency : 50 Hz
- Type of starting : Direct on line (soft starter)
- Protection type : IP55
- Insulation class : F
- Number of poles : 4
- Synchronous speed : 1500 rpm
- Standard Efficiency : IE1

The contractor is reminded that in this scope of works the pump is existing and will be re-used but the rest of the equipment is new and the contractor will provide calculations to the Engineer for approval to show that the contractor's proposed solution is suitable for the application. Therefore the values provided above are indicative only for costing purposes and the contractor will verify these with his own calculations.

4.5.3 Technical Requirements

Guaranteed torque/speed characteristics for motors from zero to full speed shall be supplied. The motors shall have maximum continuous rated outputs for an S1 classification of duty in accordance with SANS 60034.

The motors shall be suitable for full voltage starting direct on line.

Installation of the motors directly onto the gearboxes can be done at the place of manufacturing and transported to site as complete units.

All bearings shall be equipped with RTD type temperature sensors, and leads from the RTD's shall be wired to a separate terminal box. Motor winding temperatures shall be continuously monitored by means of RTD's embedded in the windings.

The motors shall be equipped with 240 V anti-condensation heaters to keep the motor windings free of ingress of moisture when motors are switched off. A special terminal box mounted on the motor shall be fitted with a red pilot lamp to indicate when the heaters are on.

Motor winding terminal boxes shall accommodate surge arrestors. The surge arrestors shall be included in the offer for the motors.

Bearings shall be sealed and shall have a nominal life rating of 100,000 hours.

The bearing system of motors with vertical shafts shall be capable of carrying an axial thrust equivalent to not less than twice the weight of the rotor.

Motors shall be supplied with lifting eyes to enable each motor to be lifted by an overhead crane. The lifting eye shall be suitably rated for the mass of the fully assembled motor.

The Contractor shall supply catalogue of the electrical motors proposed with his offer for valuation purposes.

5. MECHANICAL GENERAL

5.1 Drawings

5.1.1 Drawings issued by the Engineer

The Drawings issued as part of the tender documentation are not manufacturing drawings and the dimensions given are only sufficient for tendering purposes or to enable the Contractor to complete his working drawings.

5.1.2 Contractor's Drawings

The Contractor shall submit drawings for the following purposes:

- Tendering
- Manufacturing for approval
- Installation for approval
- As built records

Tender Drawings

For the purpose of assessing the Tender, drawings giving information of the equipment offered, i.e. cranes, hydraulic equipment, valves etc., shall be submitted with the Tender. The drawings shall include overall dimensions, materials of construction etc.

Manufacturing Drawings

Before commencing the fabrication, drawings in triplicate shall be submitted for approval by the Engineer. These drawings shall cover the general arrangement, assembly and supporting detailed drawings of the equipment offered and their related ancillary equipment.

The drawings shall provide complete information regarding thickness and types of material, finishing of surfaces, fixing and connections, standard parts, tolerances, clearances with regard to other machine parts or building faces and in general everything that may have a bearing on the satisfactory fabrication, erection and operation of the equipment shown on these drawings.

Electrical equipment wiring and or hydraulic diagrams for the sub-assemblies such as distribution and control boards, as well as overall integrated cabling and wiring diagrams for the complete installation, shall be prepared and submitted in a similar fashion to these drawings.

These drawings shall be submitted within the period(s) as prescribed in the Project programme. All drawings submitted must signify authorisation by the Contractor. Submission of the Contractor's Drawings shall be accompanied by one or more updated index sheets prepared on A1-size sheet, listing all drawings with numbers, titles and status of amendments.

Two weeks after submission by the Contractor, or 10 days in the event of re-submission, the Engineer will return one of the above-mentioned prints either with his certified approval or else with his comments regarding any amendments that may be required. A drawing returned to the Contractor for amendment purposes shall be re-submitted in its amended form within 2 weeks of the date of receipt of the drawing by the Contractor.

Approval of the above drawings by the Engineer shall only signify approval of the general design and layout and shall not make the Engineer liable for any error by the Contractor.

Priority shall be given to those drawings regarding items that affect the concrete or other construction work of a civil engineering nature. These drawings shall detail in full, the necessary provisions to be made in the concrete or other supporting structure(s) for casting in of embedded parts and anchors for fixing of built-in parts and equipment.

All the foundation details and the positions and dimensions of all connecting rods, pockets, vent ducts, cable ducts, anchor bolt holes and similar items, as well as aligning, fixing, anchoring and second stage concrete requirements must be clearly indicated and detailed on these drawings with the general requirements for built-in parts.

The magnitudes and directions of all forces and loads, both static and dynamic, exerted by the equipment on the supporting concrete structure shall be clearly and fully detailed on the Contractor's Drawings. Any special requirements to prevent transmitting possible vibrations must also be shown.

Installation Drawings

Not later than three weeks after the proposed equipment has been given approval, drawings shall be submitted to allow for adequate site preparation before the arrival of the equipment. These drawings shall offer the necessary details for the programming of civil works, including foundation details.

The Engineer has the right to suspend manufacture until a set of drawings, calculations, a draft Operation and Maintenance Manual and Quality Control Plans (for the manufacture and corrosion protection including data sheets of paint and abrasives used) are in his possession and approved in principle.

As-built Drawings

On completion of the Works, the Contractor shall deliver to the Engineer's office one complete set of high quality paper copies together with an electronically saved version preferably on Compact Disc of the Contractor's Drawings, updated to reflect the as-built information. These drawings must be clearly marked as "As Built".

These drawings shall contain general arrangements, assemblies, parts lists (including part numbers) and complete component details as well as wiring and hydraulic diagrams. These items are required in draft form before the testing and commissioning are commenced and in final form before Taking Over in terms of the General Conditions of Contract.

5.1.3 **Notes and Part Lists**

Notes on the drawings shall be in English and dimensions in the metric system in SI units with all scales clearly stated.

The Parts Lists shall be part of the assembly drawing unless otherwise agreed to by the Engineer.

5.1.4 **Drawing Identification and Number**

All drawings shall be consecutively numbered.

Each drawing shall be provided with a title block as per the construction drawings issued by the Engineer. A proforma drawing frame and title block is available electronically from the Engineer on request.

5.1.5 **Quality**

The standard of draughtsmanship and detailing shall conform to the requirements of SANS 10111 & 10143. Drawings shall be clear, black line on white paper, unfolded and suitable for microfilming purposes.

Unless otherwise agreed to by the Engineer, the Contractor's Drawings shall be prepared on A1-size (594 x 841 mm) high quality paper. The size of the drawing shall not compromise the clarity of the prints.

5.2 Operating and Maintenance Manuals

Three hard copies of Operating and Maintenance Manuals and one electronic version on CD shall be supplied. A Draft copy of the manuals shall be submitted for approval simultaneously with the drawings for manufacturing purposes

5.2.1 General Contents

The purpose of these documents is to simultaneously provide a permanent and accurate record of all the equipment provided including the design thereof as well as a usable guide in simple language covering operating, maintenance and fault finding procedures.

Where appropriate copies of approved final design calculations shall form part of the manuals

It shall provide complete particulars, charts and diagrams with regard to lubrication, servicing, overhauling as well as testing operations and maintenance of all items of equipment referred to above.

The Operation and Maintenance Manuals shall further provide all the information required to identify and obtain replacement parts and should include parts lists and the addresses of local suppliers as well as pictorial presentations of the sequences of disassembly and assembly of major as well as sub-assemblies down to the component parts.

A collection of manufacturer's descriptive leaflets, instruction sheets, charts, lists, pamphlets and the like will not be acceptable in place of the Instruction Manual, though they shall be provided as complementary thereto.

As soon as he is able to do so, and in any case not later than the time at which any item of the Works is delivered to the Site, the Contractor shall submit for the Engineer's approval a set of instructions appropriate to the erecting, testing and commissioning, operation and running maintenance of that item. These instructions shall take the form of a draft of the relevant part of the Instruction Manual.

5.2.2 Binding

The manuals shall be securely bound in A4 size, hard backed plastic waterproof 4-ring binders with clear pockets on the spine and front cover for the insertion of title slips. The binders shall be marked on the outside front cover and the side cover with the name and number of the Contract, description of the equipment supplied and date of completion. A master index applicable to all binders as well as a detailed index to the particular binder shall be provided in each binder.

5.2.3 Layout

The manuals shall contain all the information required to enable the equipment to be used for the purpose for which it was designed and to maintain it in an operating condition. At least the following aspects shall be covered in the Operation and Maintenance Manuals:

- Title Page
- Contents
- Lethal Warnings & Safety Precautions
- Introduction and Leading Particulars including design criteria and detailed design calculations where appropriate
- Detailed Description of Equipment and Technical Schedules
- Equipment data sheets and equipment technical manuals
- Installation Instructions
- Operating instructions (including Pre-start, safety and shut down procedures)
- Routine Servicing and Maintenance Procedures

- Fault diagnostics and repair procedures
- Detailed schedule of plant components giving material, corrosion protection, part nr, etc.
- Spare parts list : Suppliers/Agents must be provided
- Test procedures and certificates (including appendices to design calculations where appropriate)
- Relevant drawings

The sections shall be separated by plastic dividers, clearly and visibly marked to match the index.

5.2.4 Quality

Information and data supplied in the Manuals shall be original documents or high quality copies thereof. Copies of faxes shall not be accepted. Where these manuals contain sections which have been translated, one copy of the translated sections in the original language shall also be submitted in a similar file and cross-referenced with the related manual(s).

5.2.5 Approval

Two draft copies of these manuals shall be delivered to the Engineer, for his approval, before the commencement of the commissioning of the equipment. The final version of the manuals will further incorporate any amendments found necessary during execution of commissioning.

5.3 Materials and Workmanship

5.3.1 Introduction

This part of the Specification sets out the general standards of materials to be supplied by the Contractor and mention of any specific material or Plant does not necessarily imply that such material or Plant is to be included in the Works.

All component parts of the Plant shall, unless otherwise specified, comply with the provisions of this part and be subject to the approval of the Engineer.

The names of the manufacturers of materials and equipment proposed for incorporation in the Works, together with performance reports, capacities, certified test reports and other significant information pertaining to such manufacturers, shall be furnished when requested by the Engineer, who shall have power to reject any parts which, in his opinion, are unsatisfactory or not in compliance with the Specification and such parts shall be replaced by the Contractor without additional payment.

The Contractor shall submit proof of local maintenance support services and that all plant installed can be maintained and repaired using local backup services.

5.3.2 Compliance with Standards

The materials, design and workmanship shall be in accordance with the appropriate Specification current at the time of manufacture unless otherwise specified. Providing the Contractor has stated in his Tender that any part of the works offered conforms to some other equal or better Standard and the Employer has accepted such offer, such other Standard shall prevail.

Should the Contractor desire for any reason to deviate from the Standards specified or the aforesaid equal or better Standard, he shall submit for the Engineer's approval a statement of the exact nature of the deviation, fully supported by copies of the equivalent Standard (in English) and complete Specification of the alternative materials proposed. It shall be the responsibility of the Contractor to demonstrate that any alternative Standards proposed are equal or superior to those specified.

Within this Specification the Particular Requirements shall take preference over the General Standards.

Refer to Clause 8 for a list of applicable standards.

5.3.3 **Material**

All material and Plant, where not specified, shall comply with the relevant Standard Specifications

All materials incorporated in the Works shall be the most suitable for the duty concerned and shall be new and of first class commercial quality, free from imperfection and selected for long life and minimum maintenance.

All parts subject to submergence or subject to relative movement shall be of corrosion-resistant metals or other materials as appropriate. All parts in direct contact with various chemicals shall be completely resistant to corrosion and abrasion by those chemicals. All parts shall maintain their properties with minimum deterioration due to passage of time, exposure of light or any other cause.

Particular attention shall be paid to the prevention of corrosion due to the close proximity of dissimilar metals. Where it is necessary to use dissimilar metals in contact, these shall be selected so that the bimetallic corrosion potential is minimised or preferably eliminated by the use of standard isolating procedures.

All materials, supplies or articles used in the works shall be new products of recognised reputable manufacturers with established dealerships and/or agencies in Angola or the Republic of South Africa and subject to the approval of the Engineer. Products will be approved only when the Engineer shall have been notified and have satisfied himself as to their strength, reliability, durability and suitability for the application intended.

To assist the Engineer in this matter the Contractor shall furnish performance data, references to completed works and any other relevant information together with samples of materials for approval. Materials, equipment and other articles incorporated in the Works without the approval of the Engineer may be subsequently rejected by the Engineer.

No welding, burning, filling or plugging of defective castings or any other components will be permitted without the Engineer's agreement in writing. Any steel casting which has, with the Engineer's consent, been repaired by welding shall be subjected to all necessary testing and detection methods to confirm the absence of imperfections, such as prescribed by BS 4080 and BS 4124.

5.3.4 **Workmanship**

Workmanship and general finish shall be of first class commercial quality and in accordance with best workshop practice. Preference may be given to contractors who employ recognised quality management principles/procedures.

The fabrication, machining and finish (incl. corrosion protection procedures) of all parts shall be such that when the work is assembled both in the shop and at the Site, the appropriate tolerances and clearances shall be obtained. The clearances used shall be sufficiently small to avoid vibration but all moving parts shall operate freely and shall be such that the risk of undue wear or jamming under load or on account of debris, temperature effects, encrustation or other causes is minimised.

All burrs shall be removed, flame cut edges dressed and sharp edges ground off to a radius of at least 3 mm and smoothed. Holes shall be drilled, not punched.

All similar items of Works and their component parts shall be completely interchangeable. Spare parts shall be manufactured from the same type of materials as the originals and shall fit all similar items of Works. Machinery fits on renewable parts shall be accurate and to specified tolerances so that replacements made to manufacturer's Drawings may be readily installed.

All equipment shall operate without harmful vibration and with minimum of noise. All revolving parts shall be statically and dynamically balanced so that when running at all operating speeds and any load up to a maximum, there shall be no vibration due to lack of balance

All parts which can be worn or damaged by dust shall be totally enclosed in a dust-proof housing.

Fabrication of stainless steel shall be in accordance with the various most recent fabrication guidelines as those published by British Stainless Steel Association (BSSA) or equivalent American or German associations.

5.4 Fasteners

Nuts, bolts, studs and washers for incorporation in the Works shall conform to the requirement of the appropriate British or other approved standard. Nuts and bolts for pressure parts shall be the best quality bright steel, machined on the shank and under the head and nut. Bolts shall be of such standard length that a minimum of two to four complete threads shall show through the nut when in the fully tightened condition. Washers shall be provided under all nuts. Mating surfaces shall be adequately protected against corrosion whilst awaiting assembly of the faces and bolting all to the approval of the Engineer.

All bolting shall comply with the general requirements of BS EN 1090.

Mild steel bolts, rag bolts, nuts and washers shall conform with BS 4360 grade 43D or such higher grade as may be required for steel temperatures down to -30°C as regards material. Nuts and bolts shall conform to BS 4190 as regards dimensions. Washers shall conform to BS 4320 as regards dimensions unless otherwise specified.

Stainless steel bolts, nuts and washers shall be according to BS 6105 and from a grade of stainless steel approved by the Engineer. Threads shall be rolled and of a high quality surface finish.

High strength friction grip bolts, nuts, load indicator washers and washers shall comply with BS 4395 and BS 4604 and shall be hot dip galvanised. High strength friction grip bolts shall be tightened in accordance with the manufacturer's recommendations and the tension shall be re-checked not less than 3 hours after first tightening and then the bolts shall be re-tightened to the initial load all to the approval of the Engineer.

Metal coatings and other treatments applied to fasteners shall be carried out in a manner which will not cause hydrogen embrittlement of the parent material. Bolts, screws and nuts shall conform to the requirements of SANS 135, SANS 136 and SANS 1143 as applicable.

Fitted bolts shall be a light driving fit in the reamed holes they occupy, shall have the screwed portion of a diameter such that it will not be damaged in driving and shall be marked in a conspicuous position to ensure correct assembly at Site. Unless otherwise specified the tolerance on the specified diameter of dowels shall be -0.05 mm to -0.[illegible]0 mm for use in holes for fitted bolts.

Service bolts shall have the same nominal diameter as the specified permanent bolts. Where it is important that there shall be no movement prior to final connection, sufficient dowels, close tolerance bolts or high strength friction grip bolts shall be used to locate the work. All service bolts shall be replaced by the specified permanent bolts.

Washers, locking devices and anti-vibration arrangements shall be provided where necessary and shall be subject to the approval of the Engineer.

Where bolts pass through tapered structural members matching taper washers shall be fitted where necessary and be orientated correctly to ensure that no bending stress is caused in the bolt.

Where there is a risk of corrosion, bolts and studs shall be designed so that the maximum stress in the bolt and nut does not exceed half of the yield stress of the material under all conditions. The shear

value of high strength friction grip bolts shall be reduced in proportion to the reduced tensile stress compared with the normal design stress

No tapped holes in mild steel shall be allowed. Where tapped holes are unavoidable, this shall be done into stainless steel.

Where bolts and nuts are required to be removed and re-assembled on a regular basis, these shall be of stainless steel

All high tensile bolts and studs used shall have the grade stamped or engraved on the end.

The threads of bolts and studs shall be cleaned and coated with a graphite/grease compound before assembly. The threads of all bolts and studs used with the equipment supplied shall be to the same standard.

5.5 Welding

5.5.1 Primary Requirements for Welding

Welder's Qualification

The Contractor shall only use welders suitably qualified in accordance with BS EN 1090 or in accordance with such appropriate sections of BS 4871, BS 4872 or in terms of the relevant part of SANS Code of Practice 10044, and shall submit to the Engineer copies of the qualifications of all welders to be employed in the fabrication of items prior to commencement of any such fabrication.

The Engineer shall have the authority to order that any welder whose work he deems to be questionable shall be re-tested in his presence. No separate payment shall be made for such tests. Welders will be required to be re-qualified for the welding procedures in respect of which they have approved qualifications should they have failed to be employed on work involving these procedures for a period of six months or longer.

Weld Procedure Specification

The Contractor shall also submit to the Engineer for this acceptance a copy of his Weld Procedure Specifications (WPS) in terms of the relevant part of the aforementioned Codes. These documents shall contain full details of welding procedure, detail Drawings of welds and weld preparations. The Contractor shall carry out, without additional payment, such welding procedure tests as the Engineer may order to prove the sufficiency of his proposed procedures.

No welding shall commence until all welding procedures have been approved by the Engineer in writing. No alteration shall be made to any previously approved procedure without prior approval of the Engineer.

Welding Standards and Heat Treatment

All welding of the various types of steel used in fabrication under this Contract shall be in accordance with the relevant South African or British Standards, or as specified below, and shall include for preheating of the components where required.

In particular the requirements for materials, details of butt and fillet welds, welding procedure details, inspection and testing and heat treatment as specified in BS 5135 for the welding of mild steel and carbon manganese steels, respectively, shall apply.

The welding of stainless steel shall be in accordance with the various most recent welding guidelines published by the British Stainless Steel Association (BSSA) or equivalent American or German associations.

All welding for hydro-mechanical steelwork shall be continuous. Where possible, all fillet welds are to be returned at the ends. Welding equipment, electrodes and rods shall conform to the requirements of

the appropriate AWS or BS Specifications such as BS EN 60974 for metal-arc welding equipment and BS EN 1011 / ISO/TR17671 for arc welding of stainless steels.

The storage and handling of all consumables shall be in accordance with BS 5135.

All components subjected to heat during fabrication shall be properly stress relieved in accordance with the requirements in the relevant SANS or BS Specifications and in particular the most recent guidelines published by the BSSA in the case of stainless steels. All stainless steel areas affected by welding shall be pickled and passivated in accordance with the most recent fabrication guidelines published by BSSA.

All welds between plates 25 mm or greater in thickness whether carried out in the shop or at the Site shall be stress-relieved by an approved post-weld heat treatment unless otherwise agreed in writing by the Engineer. Final machining shall be done after stress relieve and the Contractor shall submit proof to the Engineer that the specific items has been stress relieved

5.5.2 Acceptance tests for Welding

General Requirements for Quality Assurance

All welds shall be continuous and even, with no contact gaps, and crevices left between members or unfilled re-entrant corners which would harbour moisture or dirt and prevent the satisfactory application and retention of the corrosion protective system.

Removal of slag from welds which will be subject to tensile stresses shall be carried out by grinding or blast cleaning. Peening shall be carried out only where approved by the Engineer.

The finish of the welded joint shall be free from irregularities, weld splatter, grooves and depressions. Undercutting at the welded joint shall not be permitted. Where welds are ground smooth, grinding shall where possible be in the direction of the principle stress. All fabrications which are subsequently to be machined in any way shall be stress relieved prior to machining.

The soundness of welding shall be meticulously confirmed by the Contractor by means of examinations and non-destructive testing as described below.

All welds shall be visually examined and shall conform to the requirements stated in BS EN 1090 or appropriate AWS standard. In addition to the visual examination the welds shall also be inspected and tested by other non-destructive methods referred to below with the extent of additional testing varying with the type of loading and exposure to which the weld will be subjected.

The Contractor shall keep a complete record of all examinations and testing of welds, copies of which shall be submitted to the Engineer on request. Any rectification of faulty welds as a consequence of the above examination procedures shall also be recorded and filed with the test records.

Fillet Welds

The fabricator shall place at the disposal of the Engineer's representative a set of gauges to allow for fillet welds to be checked for throat thickness and profile.

Highly stressed fillet welds and fillet welds exposed to water either on a permanent or intermittent basis (neglecting the protection system to be applied) shall be checked by means of magnetic particle inspection (MPI) or penetrant testing to prove that the weld metal, the heat affected zones and the surrounding parent metal are all free from cracks. Magnetic particle testing of welds shall be carried out in accordance with BS EN 9934 while the method for penetrant testing shall conform to the requirements of BS EN 571.

These tests shall constitute at least 10 percent of the total length of the weld. The length of weld actually examined shall include the sections at the start and end of the weld, sections at any weld junctions and

further sections evenly spaced between the aforementioned sections. If any test section shows defects the untested length of weld on both sides of the tested section, extending up to a test section found to be free from defects, shall be tested in full.

Butt Welds

The quality of butt welded joints which are under stress or exposed to water (as for fillet welds above) or in plate exceeding 10 mm in thickness, shall be tested by means of radiographic examination (RT) in accordance with BS EN 1435.

All but welds in plates 10 mm thick and over shall be tested radiographically in full. For highly stressed or butt welds exposed to water (as referred to above) at least 20 percent of the length of individual butt welds shall be examined radiographically. The length of weld examined shall include the particular sections referred to above for fillet welds.

When examined radiographically butt welds shall comply with the requirements as stated in the standard BS specifications. If any radiograph reveals one of the unacceptable defects referred to in the aforementioned Code, a further radiography of about 300 mm minimum length shall be taken on both sides (if applicable) and adjacent to the section of weld showing the defects.

If these two additional tests reveal no unacceptable defects, the defects in the middle section shall be repaired and fully re-examined radiographically. Providing that the repair is satisfactory in terms of the foregoing, the relevant section of weld shall be accepted. If any one or both of the additional radiographs reveal unacceptable defects, the whole untested section of weld up to the next tested section, which showed no unacceptable defects on first stage radiography, shall be radiographed. Unacceptable defects shall be repaired and again re-examined by radiography.

5.5.3 **Weld defects and repair**

The Engineer shall be notified of all defects before any repair work is commenced and the repair technique shall be subject to the approval of the Engineer. Where ordered by the Engineer repairs shall be subject to radiographic and/or ultrasonic testing.

No weld shall be repaired more than twice.

6. CORROSION PROTECTION AND QUALITY CONTROL

Exterior surfaces, except for machined surfaces, shall be corrosion protection with a two-pack epoxy applied to minimum DFT of 250 microns and in accordance with manufacturer's product data sheet. In severe corrosive conditions, special protection may be specified. The standard shade of manufacturer is acceptable unless otherwise specified elsewhere.

Exterior machined surfaces shall be coated with suitable rust preventive.

The interior of the gear units shall be clean, free from scale, welding spatter and foreign objects and as a minimum requirement sprayed or flushed with suitable rust preventive that can be removed with solvent. The rust preventive shall be applied through all openings while the gear unit is slow-rolled.

The cleanliness of shot blasted steel surfaces shall not be less than SA2.5 of ISO 8501-1.

Within 4 hours of blast cleaning (or less if relative humidity exceeds 70 %) apply a suitable primer which shall be suitable for overcoating with two pack epoxy material on external surfaces.

Priming shall be allowed to cure for minimum of 24 hours before machining.

Internal steel areas of bearing housings and carbon steel oil systems, auxiliary equipment (piping) shall be coated with suitable oil-soluble rust preventive. Each unit shall be properly packed with adequate cushioning material to withstand transit damage.

Paint finishing shall be done after final shop test running. The tenderer shall submit on request his standard finish paint specification for approval.

All equipment shall be assembled and tested for straightness tolerance. The Contractor shall further allow the inspections by the Engineer to satisfy himself that the Works are cleared of all weld splatter, burrs before the items are sent for corrosion protection.

On completion of corrosion protection but before the items are dispatched to site, the Contractor shall make provision for a final inspection. This shall include all necessary dry film thickness and pinhole tests. The Contractor shall further ensure that all quality control records are up to date and provided to the Engineer.

In addition the elements shall be shop assembled to check the functionality of the completed components.

7. TESTING AND COMMISSIONING

Gearboxes shall be tested together with the driving motors and driven equipment as required in the standard specification on testing and commissioning.

The Contractor shall make provision in her/his bill for first oil fill of both gearboxes and all consumable that may be required to fit both units.

8. STANDARDS

All materials and Plant provided under this Section shall comply with the latest revision of the following standards:

The Occupational, Health and Safety Act, (Act 85 of 1993 and its regulations)

The Electricity Act, (Act 88 of 1996)

IEC 60529	:	Degrees of protection for enclosure
IEC 60815 – 4-17	:	EMC, testing and measurement techniques
SANS 1804-2:2012	:	Induction Motors – Low-voltage three-phase standard motors
BS EN 1561:2011	:	Founding – Grey Cast Iron
AGMA 6013-A06	:	Standard for Industrial Enclosed Gear Drives
ISO 281:2007	:	Rolling bearings – dynamic load ratings and rating life
SANS ISO 9001	:	Quality Management Systems
SANS 60034	:	Rotating electrical machines
SANS 10111	:	Engineering Drawings
BS 4080	:	Methods for non-destructive testing of steel castings
BS EN 9934	:	Non-destructive testing: Magnetic Particle Inspection
BS EN 1090	:	Qualification of Welders
BS 5135	:	Specification for arc welding of carbon and carbon manganese steels
ISO 8501-1	:	Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of un-coated steel substrates and of steel substrates after overall removal of previous coatings.

9. MEASUREMENTS AND PAYMENT

6.001 Design and other documentation **Unit: lump sum (Sum)**

The rates tendered shall include full compensation for the design of the complete installation including full design calculations, detail working drawings for all items, specifications, schematic diagrams, electrical drawings and wiring diagrams layout drawings, operating and maintenance instructions, programmes of work (manufacture and on-site) and any other work as specified.

6.002 Supply and deliver of Plant to Site **Unit: number (No.)**

Or: lump sum (Sum)

Measurement shall be made on the basis of the Plant or associated items supplied and delivered to Site.

The rates tendered shall include for full compensation for the supply and delivery including, supply of raw materials and bought-out items and associated operating equipment, fabrication/manufacture/assembly, quality assurance and quality control, factory acceptance test (including attendance on inspection/tests witnessed by the Engineer), type and routine tests, application of finishes (paint/corrosion protection), trial erection and dismantling, preparation and packing for transport, loading, transport from place of manufacture to the Site; insurances during transport to Site.

6.003 Installation of Plant **Unit: number (No)**

Or: lump sum (Sum)

Measurement will be made on the basis of plant/equipment and/or associated items installed.

The rates tendered shall include for full compensation for the installation including the provision of all labour, equipment, transport, materials and temporary works necessary to install the complete works, on-site quality assurance and quality control, inspection and testing (including attendance at tests witnessed by the Engineer), the installation of all auxiliary equipment, pipe work, etc.), necessary for the operation of the installation until taken over by the Client, the putting into service of the complete installation.

The rate shall also include for all testing and the provision of equipment therefore including all disruptions to installation caused by such testing.

6.004 Testing and Commissioning **Unit: lump sum (Sum)**

Payment for Testing and Commissioning will separately be made to final installation. The rates tendered shall include full compensation for all testing including labour, supervision, materials, lubricant, special tools, instruments, etc. necessary for the testing, assuming responsibility for all operations necessary during testing, (including attendance to tests witnessed by the Engineer), remedial work and any other work as specified. The rate shall also allow for the specified periodic visits during the Defects Notification Period.

6.005 Spares **Unit: Provisional Sum (Prov. Sum)**

The Contractor shall list and price the spare parts considered to be necessary as required for the mechanical portion of the works. The total amount for spares derived for each part of the Works shall be carried forward to the Bill of Quantities. The contractor shall also allow for additional gearbox oil twice the volume of the gearbox housings offered to be stored neatly in durable plastic containers.

A provisional sum has been allowed for in the bill, the actual sum to be paid shall be based on the unit rates priced in the Bill of Quantities for the actual spares ordered and supplied and the Client is entitled to purchase all, some or none of the items listed.

The rate tendered shall provide for the manufacture, supply and delivery to Site of the spares ordered and shall include permanent packing for long term storage. The spares shall be manufactured at the same time as the installed items.

6.006 Preparation of Operating and Maintenance Manuals and Drawings **Unit: lump sum (Sum)**

Payment will be made per full set of Operating and Maintenance Manuals and record Drawings submitted to the Engineer in three hard copies and one soft copy in PDF format on DVD.

The rate tendered shall include for full compensation of all costs incurred in preparing and submitting to the Engineer of the specified Operating and Maintenance Manuals and Drawings.

No taking over certificate will be signed unless the operating and maintenance manuals and drawings have been received and approved

10. APPENDIX A: DATASHEETS

APPENDIX A

		GRAVING DOCK SUBSTATION REFURBISHMENT (PORT OF EAST LONDON)
TITLE GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES ELECTRICAL MOTORS LOW VOLTAGE		PAGE 1/2 REV 1

TI: TYPE OF ISSUE — A - PRELIMINARY; B - FOR APPROVAL; C - FOR KNOWLEDGE; D - FOR QUOTATION; E - FOR CONSTRUCTION; F - AS PURCHASED; G - AS BUILT; H - CANCELLED

Rev.	TI	Description	By	Ckd	APP.	Aut.	Date
1	D	FOR QUOTATION	GO	HN	NdS	CR	2010/2015

Instructions on Filling Out This Form

I - Potential Suppliers should fill out the left column of the "Proposed" field with one of the following options: "M R" (Meets Requirements) or "D" (Deviation)

II - Suppliers must list any items marked "D" and any other clarifications in the "Deviations List", of the Technical Requisition. To include information in addition to this arrangement this datasheet, suppliers should proceed in the same manner

III - The explanatory notes at the end of the Data Sheet are to be filled out by the issues and not by Suppliers.

Supplier:	Proposal:
Identification (TAG):	Quantity: 2

Item	Description	Unit	Specification		Proposed
1	GENERAL				
1.1	Manufacturer		(Specify)		
1.2	Country of Origin		(Specify)		
1.3	Type of Motor (Induction, Synchronous, etc.)		Induction (TEFC)		
1.4	Place to be tested		(Specify)		
1.5	Altitude	masl	0 sea level		
1.6	Ambient temperature	°C	30 (max.)		
2	STANDARD REQUIREMENTS				
2.1	Voltage supply	V	400		
2.2	Number of phases	No	3 @ 50 Hz		
2.3	Number of poles	-	4		
2.4	Synchronous speed	rpm	1500		
2.5	Motor shaft output at site conditions (P)	kW	315		
2.6	Frame size	-	(Specify)		
2.7	Enclosure rating (IP rating)	-	IP 55		
2.8	Mounting arrangement	-	Flange		
2.9	Shaft axis	-	Vertical down		
2.10	Insulation	-	F		
2.11	Duty Class (S1, S2 or S3)	-	S1		
2.12	Full Load Current (FLC)	A	(Specify)		
2.13	DOL starting current ..... x FLC)	A	(Specify)		
2.14	Method of starting (DOL / STAR-DELTA)	-	DOL (Soft-starter)		
2.15	Drive details (i.e. direct, belt or gearbox)	-	Gearbox		
2.16	Moment of Inertia (MK^2) at full speed	$kg.m^2$	(Specify)		
2.17	Direction of rotation looking at shaft end	-	Bi-directional		
2.18	Power factor at duty point	cos Ø	(Specify)		
2.19	Motor Efficiency (Full Load, 75% Load and 50% Load)	%	(Specify)		
2.20	Thermal protection fitted (thermistor/ PT100)	Yes/No	Yes		

APPENDIX A

		GRAVING DOCK SUBSTATION REFURBISHMENT (PORT OF EAST LONDON)	
TITLE GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES ELECTRICAL MOTORS LOW VOLTAGE			PAGE 2/2 REV 1

Item	Description	Unit	Specified	Proposed	
2.21	Locked rotor torque	Nm	(Specify)		
2.22	Pull-up torque	Nm	(Specify)		
2.23	Break down torque	Nm	(Specify)		
2.24	Anti-condensation Heaters fitted	Yes/No	Yes		
2.25	DE bearing type (sleeve, roller, ball, etc.)	-	(Specify)		
2.26	NDE bearing type (sleeve, roller, ball, etc.)	-	(Specify)		
2.27	Bearings are bi-directional	Yes/No	Yes		
2.28	Method of lubrication (oil, grease, etc.)	-	(Specify)		
2.28	Recommended bearing brand	-	SKF, FAG, NSK or NTN		
2.29	DE bearings temperature probe fitted (PT100)	Yes/No	Yes		
2.30	NDE bearings temperature probe fitted (PT100)	Yes/No	Yes		
2.31	Cable entry (location, i.e. top/bottom and left/right)	-	Bottom		
2.32	Cable entry (type and size)	-	State		
2.33	Zorc's Fitted	Yes/No	N		
2.34	Motor Painting (B26 to SANS 1091)	Yes/No	Yes		
2.35	Method of cooling the Motor (air, water, etc.)	-	Air		
2.36	External motor cooling fan & motor	Yes/No	Y		
2.37	Instrumentation voltage	V	220		
3	GENERAL DETAILS				
3.1	Total weight of motor	kg	(Specify)		
3.2	Plinth size required	mx m	(Specify)		
3.3	Performance Test STD (SANS, BS5316, ISO 9906, etc)		SANS 1804-2		
3.4	Noise Level (measured at 3m from pump)	dBA	75		
3.5	Vibration (radial direction)	mm/s	(Specify)		
3.6	Vibration (axial direction)	mm/s	(Specify)		
3.7	Can bearings carry full load 2x motor rotor weight?	Yes/No	Yes		
4	FINANCIAL DETAILS				
4.1	Cost per unit (motor, base frame & coupling)	ZAR			Price in BOQ
4.2	Performance testing cost per unit	ZAR			Price in BOQ
4.3	Cost per vacuum unit (If se[illegible]ring)	ZAR	N/A		
4.4	Cost per pressure gau[illegible]	ZAR			Price in BOQ
4.5	Cost per Zorc	ZAR	N/A		
4.6	Total cost per pump	ZAR			Price in BOQ
4.7	Delivery time	Weeks	(Specify)		

Explanatory Notes

01 - Suplier shall refer ro reference documents listed on the requisition to complete equipment specification.

02 - Suplier shall confirm and/or provide all equipment data while filing the proposed column.

REFERENCE DOCUMENTS

APPENDIX A-

		GRAVING DOCK SUBSTATION REFURBISHMENT (PORT OF EAST LONDON)
TITLE GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES GEARBOX SINGLE REDUCTION		PAGE 1/2 REV 1

TI. TYPE OF ISSUE: A - PRELIMINARY; B - FOR APPROVAL; C - FOR KNOWLEDGE; D - FOR QUOTATION; E - FOR CONSTRUCTION; F - AS PURCHASED; G - AS BUILT; H - CANCELLED

Rev.	TI	Description	By	Ckd	APP.	Aut.	Date
1	D	FOR QUOTATION	GO	HN	NdS	CR	11052021

Instructions on Filling Out This Form

I - Potential Suppliers should fill out the left column of the "Proposed" field with one of the following options "MR" (Meets Requirements) or "D" (Deviation)

II - Suppliers must list any items marked "D" and any other clarifications in the "Deviations List", of the Technical Requisition. To include information in addition to the columns of the datasheet, suppliers should proceed in the same manner

III - The explanatory notes at the end of the Data Sheet are to be filled out by the Issuer and not by Suppliers.

Supplier:	Proposal:
Identification (TAG):	Quantity: Refer to BOQ

Item	Description	Unit	Specified	Proposed	
1	GENERAL				
1.1	Manufacturer	-	(Specify)		
1.2	Country of Origin	-	(Specify)		
1.3	Place to be tested	-	(Specify)		
1.4	Altitude	masl	at sea level		
1.5	Ambient temperature	°C	30 (max)		
2	GEARBOX DETAILS				
2.1	Type of Gearbox (parallel, right angle shaft)	-	parallel, single reduction		
2.2	Input Shaft Speed	rpm	1490		
2.3	Output Shaft Speed	rpm	375		
2.4	Output Torque	Nm	6876		
2.5	Service factor	-	2.0		
2.6	Rated Output Torque	Nm	(Specify)		
2.7	Moment of Inertia of Load (MR^2) at full speed (incl. water)	$kg.m^2$	82.6		
2.8	Gearbox Efficiency	%	98.5 (at least)		
2.9	Additional cooling required?	Yes/No	(Specify)		
2.10	Moment of Inertia at Output Shaft (MR^2)	$kg.m^2$	(Specify)		
2.11	Type of bearings on Input Shaft	-	(Specify)		
2.12	Type of bearings on Output Shaft	-	(Specify)		
2.13	Recommended bearing brand	-	SKF, FAG, NSK or NTN		
2.14	Can Input Bearing carry full load 2x motor rotor weight?	Yes/No	Yes		
2.15	Can Output Bearing carry full load 2x pump impeller weight?	Yes/No	Yes		
2.16	Recommended bearing brand	-	SKF, FAG, NSK or NTN		
2.17	Minimum bearing life rating	-	100,000 hrs (at least)		
2.18	Type of gears (spur, worm, helical, etc.)	-	helical		
2.19	Is gearbox housing fitted with sight glass indicating min and max. levels?	Yes/No	Yes		
2.20	Is gearbox housing fitted with lifting lugs?	Yes/No	Yes		
2.21	PT100 Bearing Temperature probes fitted on LSS and HSS?	Yes/No	Yes		
2.22	PT100 Oil Temperature probes fitted?	Yes/No	Yes		

APPENDIX A

		GRAVING DOCK SUBSTATION REFURBISHMENT (PORT OF EAST LONDON)	
TITLE GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES GEARBOX SINGLE REDUCTION			PAGE 2/2 REV 1

3	CONSTRUCTION MATERIALS				
3.1	Housing	-	Cast iron, Epoxy coated and lined		
3.2	Gears	-	Alloy steel, hardened		
3.3	Shaft	-	(Specify)		
4	GENERAL DETAILS				
4.1	Total weight of gearbox	kg	(Specify)		
4.2	FAT Performance test done?	Yes/No	Yes, min. 3 hrs		
5	HEALTH & SAFETY				
5.1	Noise Level	dBA	(Specify)		
6	FINANCIAL DETAILS				
6.1	Cost per unit	ZAR			Price in BOQ
6.2	Performance testing cost per unit	ZAR			Price in BOQ
6.3	Delivery time	Weeks	(Specify)		

Explanatory Notes

01 - Suplier shall refer ro reference documents listed on the requisition to complete equipment specification.

02 - Suplier shall confirm and/or provide all equipment data while filling the proposed column.

REFERENCE DOCUMENTS

11 APPENDIX B: MECHANICAL SCHEDULE OF QUANTITIES

CLIENT : **Port of East London**

CONTRACT NO : **RFQ RME 404/2016**

CONTRACT TITLE : **GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES**

SCHEDULE OF QUANTITIES

NB TENDERERS MUST COMPLETE THE SCHEDULE OF QUANTITIES IN BLACK INK

SECTION A

ITEM NO.	PAY REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (ZAR)
A. 1		**REMOVAL OF EXISTING PLANT** - Removal of main motors on Site (by Client)	No.	2	No rate	No price
A. 2	6.001	**DESIGN AND OTHER DOCUMENTATION** - Design of installation including design calculations, detailed workshop drawings, schematic diagrams, electrical drawings, etc. on items below where applicable	Sum	1		
A. 3	6.002	**SUPPLY AND DELIVER OF NEW PLANT TO SITE** **ADAPTOR PLATES** - Adaptor Plates	No.	2		
A. 4		- Fasteners	Sum	1		
A. 5		**GEARBOXES** - Gearboxes Vertical Parallel Shaft Single Reduction	No.	2		
A. 6		- Shaft mounted fan for Gearboxes (if required)	No.	2		
A. 7		- PT100 Oil Temperature Sensors (incl. wiring)	No.	2		
A. 8		- PT100 Bearing Temperature Sensors (incl. wiring)	No.	4		
A. 9		**COUPLINGS** - Couplings Flexible Type (LSS) (c/w fasteners)	No.	2		
A. 10		**LV ELECTRICAL TEFC MOTORS** - 315 kW TEFC Electrical Motors, 400V, 50Hz	No.	2		
A. 11		- PT100 Bearing Temperature Sensors (incl. wiring)	No.	4		
A. 12		- PT100 Windings Temperature Sensors (incl. wiring)	No.	4		
A. 13		- Anti-condensation heaters	No.	2		
A. 14		- Surge Arrestors	No.	1		
CARRIED FORWARD:						

CLIENT	:	**Port of East London**
CONTRACT NO	:	**RFQ RME 404/2016**
CONTRACT TITLE	:	**GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES**

SCHEDULE OF QUANTITIES

NB TENDERERS MUST COMPLETE THE SCHEDULE OF QUANTITIES IN BLACK INK — Section C

ITEM NO.	PAY REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (ZAR)
	6.004	**TESTING AND COMMISSIONING OF PLANT AT SITE**				
C. 1		- 315 kW TEFC Electrical Motors, 400V, 50Hz	No.	2		
C. 2		- Gearbox units	No.	2		
C. 3		- Couplings Flexible Type (LSS) (c/w fasteners)	No.	2		
C. 4		- Final testing and commissioning of above as combination	No.	2		
	6.005	**SPARES**				
C. 5		- Essential Spares for mechanical equipment		1		
		a)	No.			
		b)	No.			
		c)	No.			
		d)	No.			
		e)	No.			
		f)	No.			
		g)	No.			
		h)	No.			
		i)	No.			
		j)	No.			
	6.006	**PREPARATION OF O&M MANUALS AND DRAWINGS**				
C. 6		- O&M Manuals for complete Installation	Sum	1		
C. 7		- Drawings for complete Installation	Sum	1		
CARRIED FORWARD:						

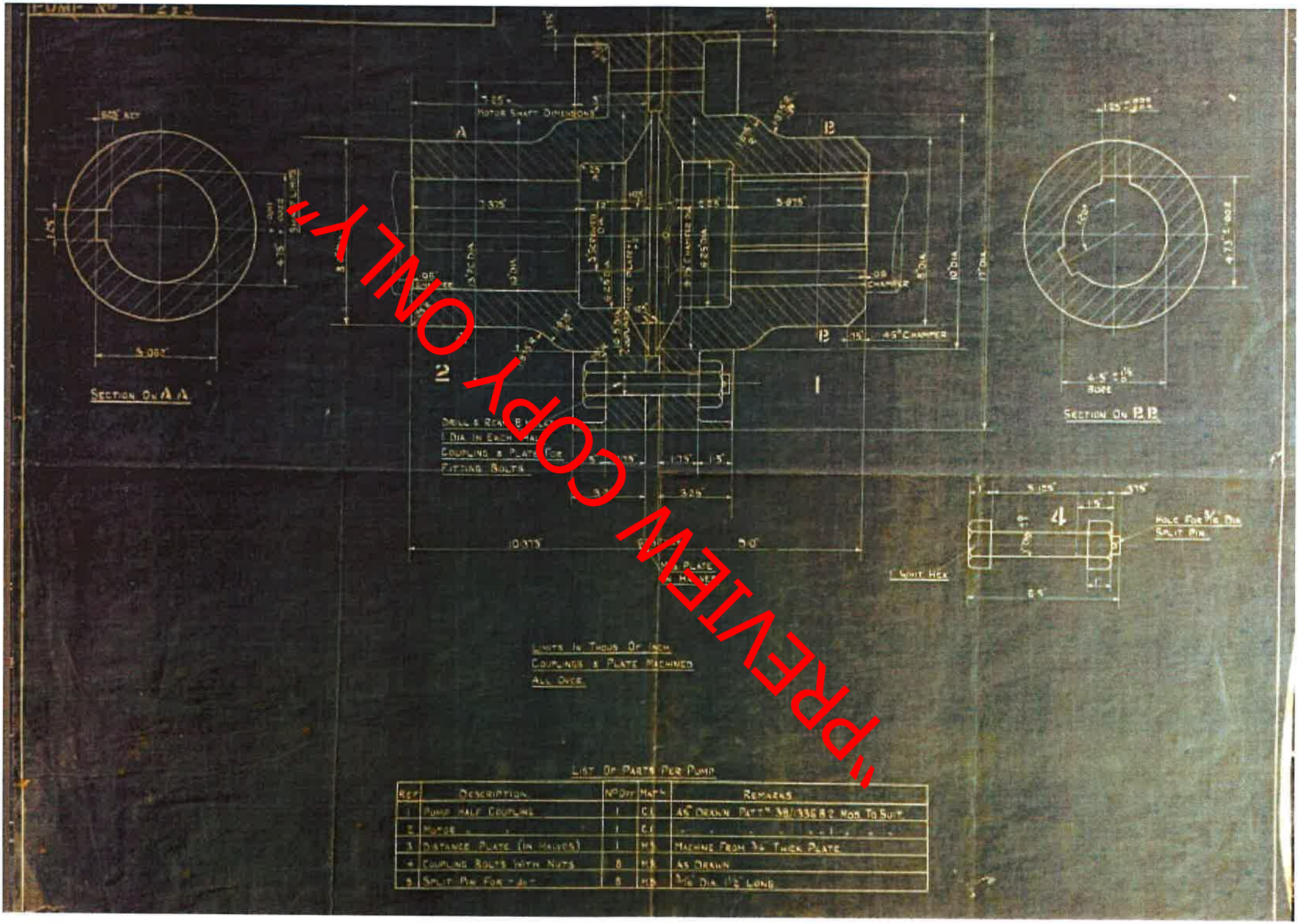
CLIENT	:	**Port of East London**
CONTRACT NO	:	**RFQ RME 404/2016**
CONTRACT TITLE		GRAVING DOCK SUBSTATION REFURBISHMENT: 400V INDUCTION MOTOR, GEARBOX & RELATED SERVICES

OVERALL SUMMARY OF SECTIONS

SHEDULE OF QUANTITIES	**AMOUNT (ZAR)**
SECTION 'A' : Supply and delivery of Plant	
SECTION 'B' : Installation of Plant	Not Required
SECTION 'C' : Testing and Commissioning of Plant	
TOTAL:	
SIGNED ON BEHALF OF TENDERER :	

TOTAL AMOUNT FROM TENDERER:

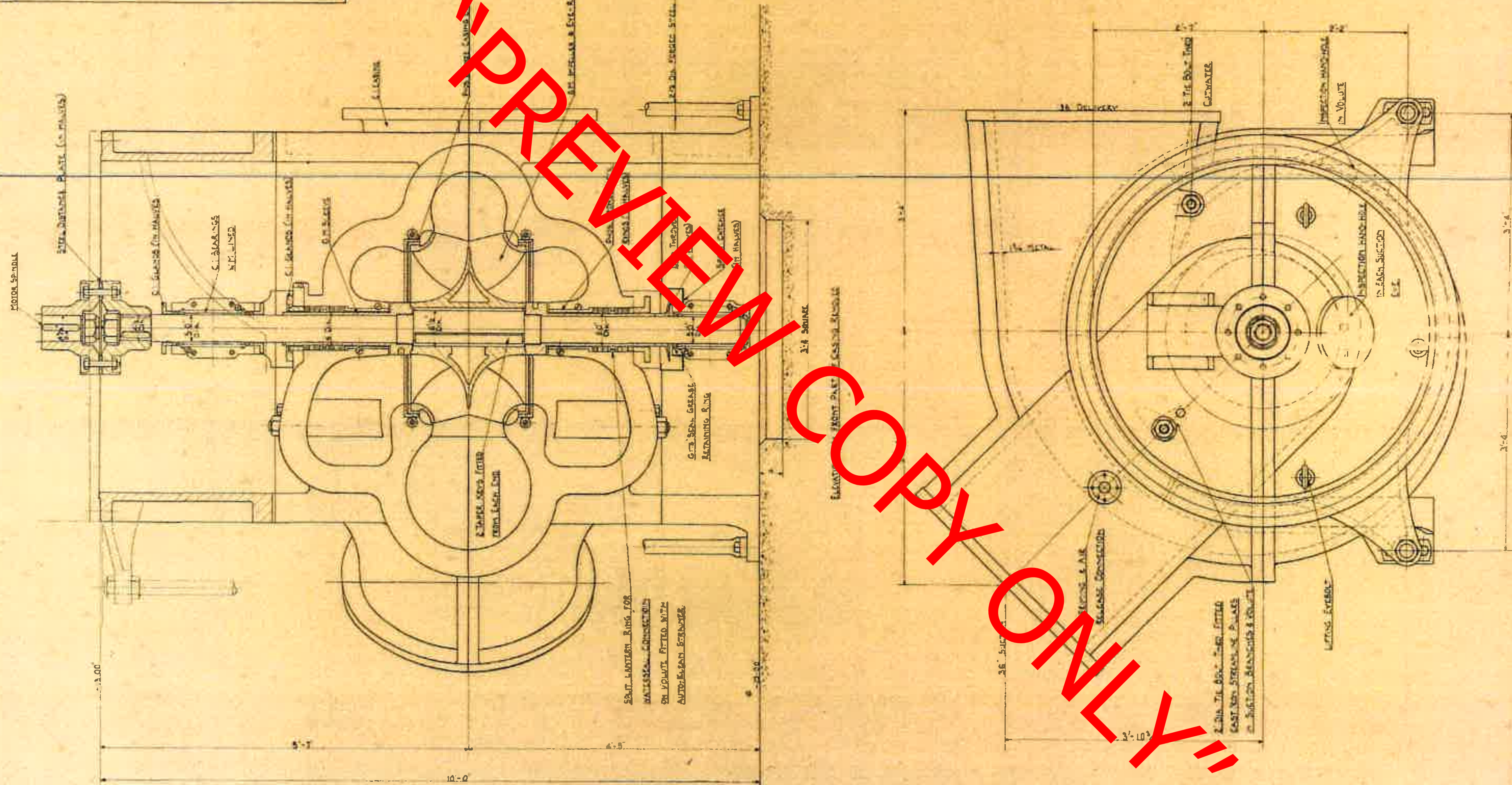
12. APPENDIX C: DRAWINGS



List Of Parts Per Pump

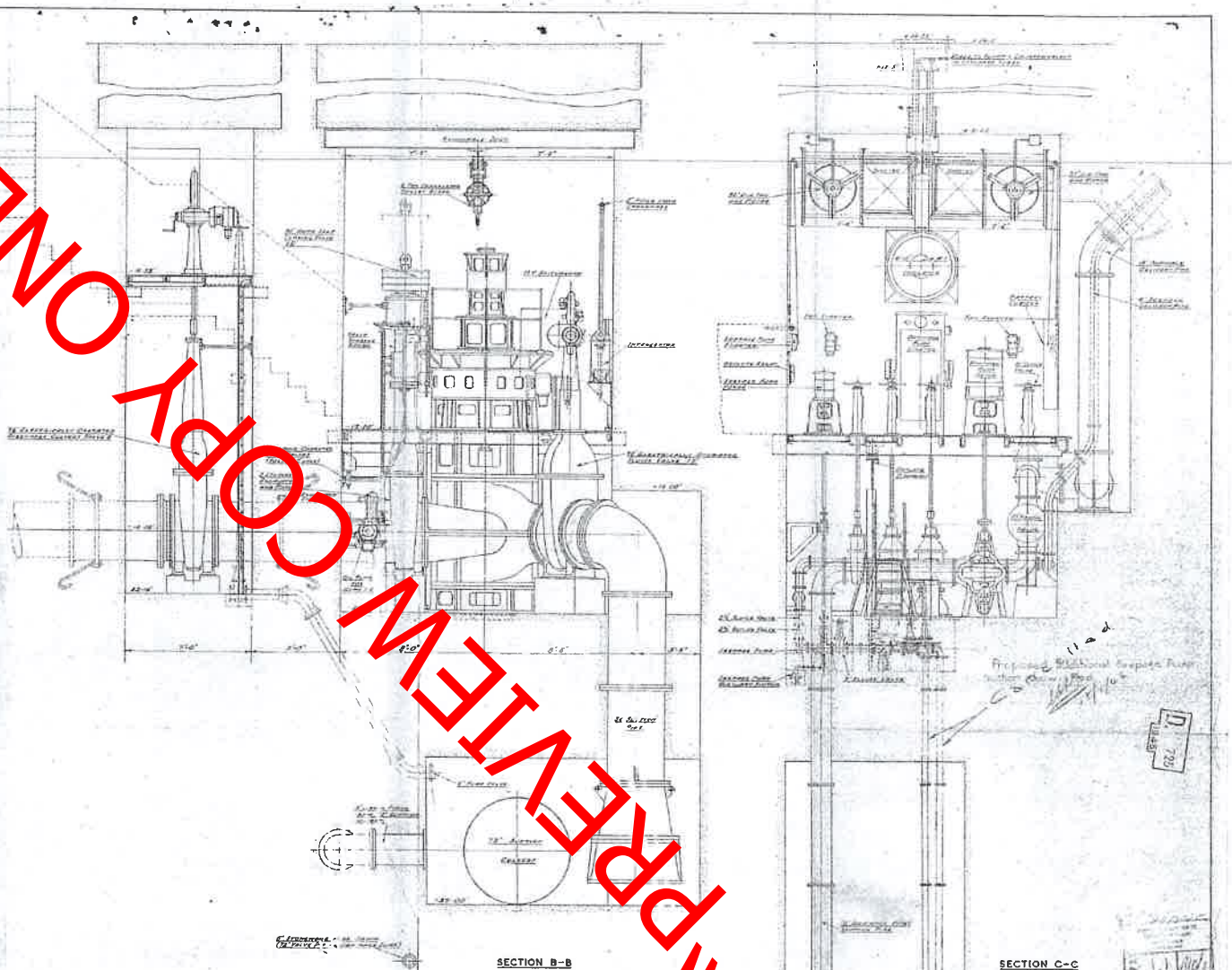
Ref	Description	No Off	Mat'l	Remarks
1	Pump Half Coupling	1	C.I.	As Drawn Patt'n 38/1336 B2 Non To Suit
2	Motor	1	C.I.	
3	Distance Plate (In Halves)	1	M.S.	Machine From ¾ Thick Plate
4	Coupling Bolts With Nuts	8	M.S.	As Drawn
5	Split Pin For 4	8	M.S.	Dia ½ Long

EAST LONDON, SOUTH AFRICA GRAVING DOCK
DOCK PUMPING MACHINERY.
SECTIONAL ARRANGEMENT OF 36" VERTICAL SPINDLE
SPLIT CASING DOCK PUMP
C.P. SA/10025I/42/S. II.H.K 7978. 24-12-43.
SCALE - 1½" TO 1 FT
PUMP Nº 1 & 2



ORDER Nº	DATE	A BOOK REF DATE	B BOOK REF DATE	C BOOK REF DATE	D BOOK REF DATE	E BOOK REF DATE	F BOOK REF DATE		DRAWN BY E.C. / TRACED BY D.J.S. / CHECKED BY	DRAWING Nº
46800		ISSUED BY	ISSUED BY	ISSUED BY	ISSUED BY	ISSUED BY	ISSUED BY	GWYNNES PUMPS LTD		44/1310

EAST LONDON, SOUTH AFRICA.
GRAVING DOCK.
DOCK PUMPING MACHINERY.
GEN. ARRGT. SECTIONAL ELEVATIONS THROUGH PUMP HOUSE.
C.P. 8A/100351/43/8. IIIH/K 7978. 24-12-43.
SCALE - ½ IN. = 1 FT.



SECTION B-B

SECTION C-C

GWYNNES PUMPS LTD.

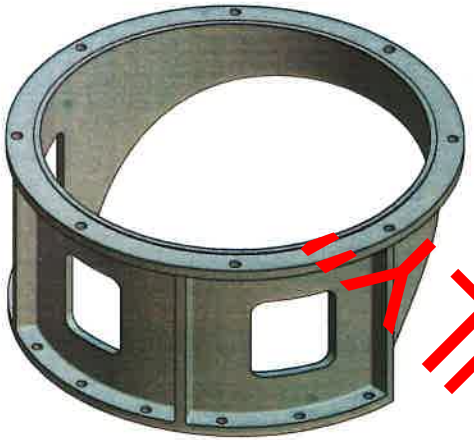
ORDER No		A	B	C
46800				

DRG. No A4/1207

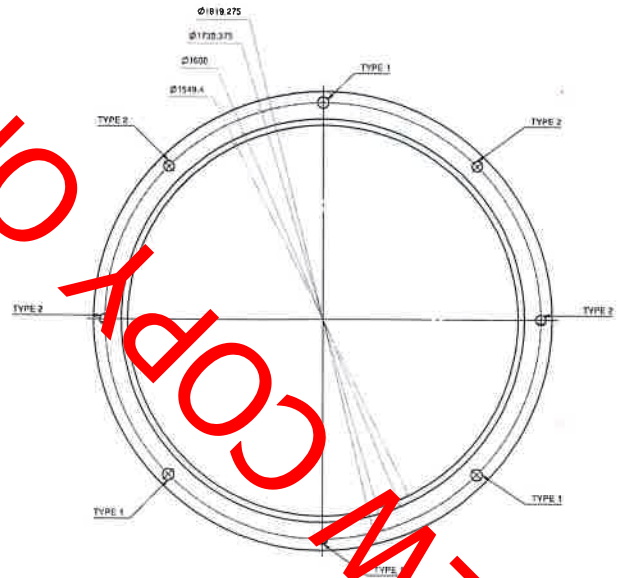
4 SHEETS SHEET 3

A

IMPORTANT:
DRAWING FOR TENDER PURPOSES ONLY
CONTRACTOR TO VERIFY DIMENSIONS ON-SITE

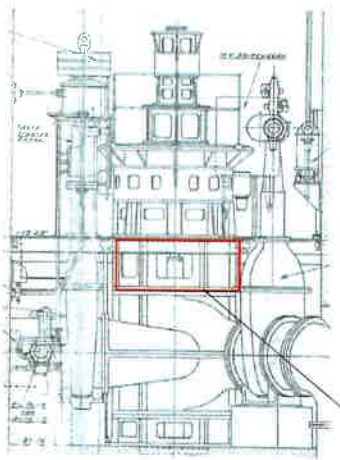


ISOMETRIC VIEW
SCALE 1:10

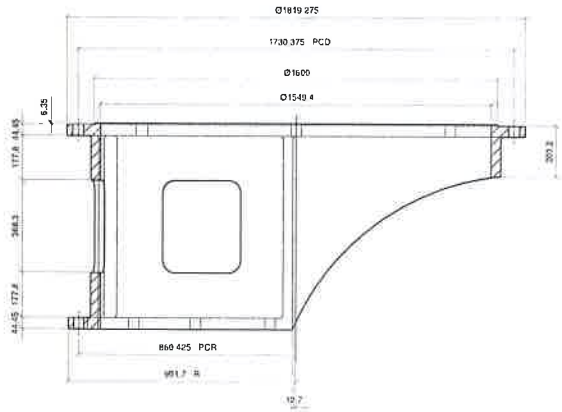


PLAN VIEW
SCALE 1:10

DETAILS FOR 8 EQUISPACED HOLES		
HOLE TYPE	NO. OF HOLES	HOLE DETAILS
TYPE 1	4	44.45 mm DRILLED
TYPE 2	4	41.275 mm TAPPED



LOCATION OF MOTOR SUPPORT BASEFRAME - UPPER PART



SIDE SECTION VIEW
SCALE 1:10

CLIENT	REV	DATE	REVISION DETAILS	APP
TRANSNET				
	0	20.05.15	FOR TENDER	M.NEL

DRAWN	DESIGNED
M. BULBULIA	
CHECKED	
G. OEGEMA	
APPROVED	DATE
H.NEL	

PROJECT: PORT OF EAST LONDON

TITLE: PUMPHOUSE
MOTOR SUPPORT BASEFRAME
UPPER PART

FOR TENDER

PROJECT No.: 111398

SCALE: AS SHOWN | SIZE: A1

DRAWING No.: 111398-PEL-ME-001 | REV: 0

ANNEXURE C: TECHNICAL SUBMISSION QUESTIONNAIRE

Previous/Current Relevant Experience

Note to tenderers:

Tenderers are required to demonstrate their experience in the supply and delivery of similar goods and to this end shall supply a sufficiently detailed reference list (minimum 2) with contact details of previous and existing customers. Must have supplied and erected similar projects successfully. The experience will be based on the number of similar project deliverables

List of References

Name of Company	Contact Person & Contact Details	Number of Motor and Gearbox supplied	Contract Period

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

ANNEXURE D : TECHNICAL SUBMISSION QUESTIONNAIRE

1. DELIVERY LEAD TIME

Note to tenderers

The Tenderer is required to demonstrate that he has sufficient current and future capacity to carry out the work as detailed in the RFQ and that he has capacity and plans in place to meet the required delivery schedule as required. To this end, the following must be provided by the Tenderer:

1) Supply and delivery lead time calculated from the date of receipt of purchase order:

_____ Weeks.

2) Tenderer shall provide the Engineer with a minimum of (1) week notification from the witnessing of inspections and factory testing.

ACCEPTED	YES	NO

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

freight rail

ANNEXURE E

TECHNICAL COMPLIANCE SHEET –RME CPT 404/2016

SUPPLY AND DELIVERY OF 400V INDUCTION MOTOR AND GEARBOX

The compliance response is to contain ONLY the following statements, **"Comply", or "Do not comply"**.

Noted is to be applied against statements and either of the other responses for all other clauses. Where either "Partial Compliance" is inserted, remarks as to the reason for the deviation from the requirement is required

Main Specification:			
Item	**Specification Clause No.**	**Compliance Response**	**Explanation / Deviation / Reason**
1	Clause 1		
2	Clause 2		
3	Clause 4.1		
4	Clause 4.2		
5	Clause 4.3.1		
6	Clause 4.3.2		
7	Clause 4.3.3		
8	Clause 4.4		
9	Clause 4.5.1		
10	Clause 4.5.2		
11	Clause 4.5.3		
12	Clause 5.1.1		
13	Clause 5.1.2		
14	Clause 5.1.3		
15	Clause 5.1.5		
16	Clause 5.2.1		
17	Clause 5.2.2		

18	Clause 5.2.3		
19	Clause 5.2.4		
20	Clause 5.2.5		
21	Clause 5.3.1		
22	Clause 5.3.2		
23	Clause 5.3.3		
24	Clause 5.3.4		
25	Clause 5.4		
26	Clause 5.5.1		
27	Clause 5.5.2		
28	Clause 5.5.3		
29	Clause 6		
30	Clause 8		
31	Clause 9		

Respondent's Signature **Date & Company Stamp**

TFR, a division of

TRANSNET SOC LTD

Registration Number 1990/000900/30

[hereinafter referred to as **Transnet]**

REQUEST FOR QUOTATION [RFQ] NO RME CPT/404/2016

FOR THE SUPPLY, DELIVERY, TESTING AND COMMISSIONING OF 400V INDUCTION MOTOR AND GEARBOX

FOR DELIVERY TO: PORT OF EAST LONDON, EASTERN CAPE

ISSUE DATE:	**04 MAY 2016**
CLOSING DATE:	**17 MAY 2016**
COMPULSORY RFQ BRIEFING	**11 MAY 2016**
CLOSING TIME:	**10:00**

Section 1
NOTICE TO BIDDERS

Quotations which must be completed as indicated in Section 2 of this RFQ are to be submitted as follows:

METHOD: [post and/or courier]
CLOSING VENUE: [courier and/or tender box at physical address]

Proposals must reach the Secretariat, Acquisition Council before the closing hour on the date shown below, and must be enclosed in a sealed envelope which must have inscribed on the outside:

Closing date and time: **17 May 2016 at 10:00 Sharp**

Closing address: *[Refer to options in Delivery Instructions for RFQ below]*

No documents will be issued between 12h45 to 13h30

All envelopes must reflect the return address of the Respondent on the reverse side.

A. DELIVERY INSTRUCTIONS FOR RFQ

Delivery by Post

If delivered by hand, the envelope is to be deposited in the Transnet tender box which is located at the addressed as follows:

The Secretariat
Transnet Acquisition Council
P O Box 2986
Bellville, 7535

a. The measurements of the "tender slot" are 400mm wide x 100mm high, and Respondents must please ensure that response documents or files are no larger than the above dimensions. Responses which are too bulky [i.e. more than 100mm thick] must be split into two or more files, and placed in separate envelopes, each such envelope to be addressed as above.

Dispatch by Hand and Courier

If dispatched by courier, the envelope must be addressed as follows and delivered to the Office of The Chairperson, Transnet Freight Rail Acquisition Council and a signature obtained from that Office:

The Secretariat
Transnet Acquisition Council
Transnet Park
06TH Floor
Transnet Park
Robert Sobukwe Road
Bellville

Please note that this RFQ closes punctually at **10:00 on 17 May 2016.**

Please note deadline for questions/RFQ clarifications is before 12h00 on the 13 May 2016

B. FORMAL RFQ BRIEFING

i. **A compulsory RFQ briefing will be conducted at Transnet National Ports Authority, Port Admin Building, Boardroom, No.1 Hely Road, Quiney, East London on the 11th of May 2016 at 11h00 for a period of ± 1hour**.

ii. The site will be visited after the briefing.

iii. Respondents to provide own transportation.

iv. Respondents must bring their own safety shoes and reflective vest (PPE clothing) for the site meetings.

v. Respondents failing to attend the compulsory RFQ briefing and site meetings will be disqualified.

Please note that this RFQ closes punctually at **10:00 on 17 May 2016.**

1 Responses to RFQ

Responses to this RFQ [**Quotations]** must not include documents or reference relating to any other quotation or proposal. Any additional conditions must be embodied in an accompanying letter.

2 Broad-Based Black Economic Empowerment [B-BBEE]

Transnet fully endorses and supports the Government's Broad-Based Black Economic Empowerment Programme and it would therefore prefer to do business with local business enterprises who share these same values. As described in more detail in the attached B-BBEE Claim Form Transnet will allow a "preference" to companies who provide a valid B-BBEE Verification Certificate.

The value of this bid is estimated to exceed R1 000 000 (all applicable taxes included) and therefore the **90/10** system shall be applicable.

Respondents are required to complete Annexure A [the B-BBEE Preference Point Claim Form] and submit it together with proof of their B-BBEE Status as stipulated in the Claim Form in order to obtain preference points for their B-BBEE status.

Note: Failure to submit a valid and original B-BBEE certificate or a certified copy thereof at the Closing Date of this RFQ will result in a score of zero being allocated for B-BBEE.

3 Communication

Respondents are warned that a response will be liable for disqualification should any attempt be made by a Respondent either directly or indirectly to canvass any officer(s) or employee of Transnet in respect of this RFQ between the closing date and the date of the award of the business.

A Respondent may, however, before the closing date and time, direct any written enquiries relating to the RFQ to the following Transnet employee before the clarification deadline:

Name: Tshegofatso Shaku Email: Tshegofatso.Shaku@transnet.net

Telephone: 021 940 1876

Respondents may also, at any time after the closing date of the RFQ, communicate with the Secretariat of the Transnet Acquisition Council on any matter relating to its RFQ response:

Name: Iwan Theron Email: Iwan.Theron@transnet.net

Telephone 021 940 1896

4 Legal Compliance

The successful Respondent shall be in full and complete compliance with any and all applicable national and local laws and regulations.

5 Changes to Quotations

Changes by the Respondent to its submission will not be considered after the closing date and time.

6 Pricing

All prices must be quoted in South African Rand on a fixed price basis, excluding VAT.

7 Prices Subject to Confirmation

Prices quoted which are subject to confirmation will not be considered.

8 Binding Offer

Any Quotation furnished pursuant to this Request shall be deemed to be an offer. Any exceptions to this statement must be clearly and specifically indicated.

9 Disclaimers

Transnet is not committed to any course of action as a result of its issuance of this RFQ and/or its receipt of a Quotation in response to it. Please note that Transnet reserves the right to:

- modify the RFQ's goods / service(s) and request Respondents to re-bid on any changes;
- reject any Quotation which does not conform to instructions and specifications which are detailed herein;
- disqualify Quotations submitted after the stated submission deadline;
- not necessarily accept the lowest priced Quotation or an alternative bid;
- reject all Quotations, if it so decides;
- place an order in connection with this Quotation at any time after the RFQ's closing date;
- award only a portion of the proposed goods / service/s which are reflected in the scope of this RFQ;
- split the award of the order/s between more than one Supplier/Service Provider should it at Transnet's discretion be more advantageous in terms of, amongst others, cost or developmental considerations ; or
- make no award at all.

Should a contract be awarded on the strength of information furnished by the Respondent, which after conclusion of the contract, is proved to have been incorrect, Transnet reserves the right to cancel the contract.

Transnet reserves the right to award business to the highest scoring bidder/s unless objective criteria justify the award to another bidder.

Transnet reserves the right to conduct Post Tender Negotiations (PTN) with selected Respondents or any number of short-listed Respondents, such PTN to include, at Transnet's discretion, any evaluation criteria listed in the RFQ document.

Should the preferred bidder fail to sign or commence with the contract within a reasonable period after being requested to do so, Transnet reserves the right to award the business to the next highest ranked bidder, provided that he/she is still prepared to provide the required goods at the quoted price.

10 Specification/Scope of Work

Refer to attached Annexure B

Returnable Document

RFQ FOR THE SUPPLY, DELIVERY, TESTING AND COMMISSIONING OF 400 INDUCTION MOTOR AND GEARBOX
CLOSING VENUE: TENDER BOX, GROUND FLOOR, TRANSNET PARK ROBERT SOBUKWE ROAD, BELLVILLE,
CLOSING DATE & TIME: 17 MAY 2016 AT 10:00
VALIDITY PERIOD: 90 BUSINESS DAYS

SECTION 2
EVALUATION CRITERA AND RETURNABLE DOCUMENTS

11 EVALUATION CRITERIA

Transnet will utilise the following criteria [not necessarily in this order] in choosing a Supplier/Service Provider, if so required:

Criterion/Criteria	Explanation
Administrative responsiveness	Completeness of response and returnable documents
Substantive responsiveness	Prequalification criteria, if any, must be met and whether the Bid materially complies with the scope and/or specification given. • Annexure C: Technical Submission Questionnaire on experience • Quality Control Plan • Annexure D: Technical Submission Questionnaire on delivery lead-time • Annexure E: Technical Compliance Sheet completed, signed and submitted • Appendix A : Datasheets Completed by the bidder • Appendix B : Mechanical Schedule of Quantities completed by the bidder • SECTION 3 : Quotation Form (to be completed in full)
Functionality Threshold	As prescribed in terms of the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations, Respondents are to note that functionality is included as a threshold with a prescribed percentage threshold of 60%. Previous/ Current relevant experience, Quality Control Plan and Delivery lead-time will be part of the technical evaluation.
Final weighted evaluation based on 90/10 preference point	• Pricing and price basis • B-BBEE status of company - Preference points will be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table indicated in Annexure A: B-BBEE Claim Form.

Functionality – (Minimum threshold of 60%)

Technical Criteria	Weighting (%)
Previous/Current relevant experience	40%
Quality Control Plan including but not limited to the following: • Design Process • Manufacturing Process • Installation Process • Delivery to Site	40%
Delivery lead-time	20%
	100%

The minimum threshold for technical/functionality [Stage Three] must be met or exceeded for a Respondent's Proposal to progress to Stage Four for Final evaluation

12 Validity Period

Transnet desires a validity period of 90 [ninety] Business Days from the closing date of this RFQ.

This RFQ is valid until _____90 days_____.

13 Disclosure of Prices Quoted

Respondents must indicate here whether Transnet may disclose their quoted prices and conditions to other Respondents:

YES ☐ NO ☐

14 Returnable Documents

Returnable Documents means all the documents, Sections and Annexures, as listed in the tables below.

All Returnable Sections, as indicated in the header and footer of the relevant pages, must be signed, stamped and dated by the Respondent.

a) Respondents are required to submit with their Quotations the **mandatory Returnable Documents**, as detailed below.

Failure to provide all these Mandatory Returnable Documents at the Closing Date and time of this RFQ will result in a Respondent's disqualification. Respondents are therefore urged to ensure that all these Documents are returned with their Quotations.

Returnable Document

Please confirm submission of these mandatory Returnable Documents by so indicating [Yes or No] in the tables below

Mandatory Returnable Documents	Submitted [Yes or No]
SECTION 3 : Quotation Form (to be completed in full)	
APPENDIX A : Datasheets Completed by the bidder	
APPENDIX B : Mechanical Schedule of Quantities completed by the bidder	
Annexure C: Technical Submission Questionnaire on experience signed and completed by the bidder	
Annexure D: Technical Submission Questionnaire on delivery lead-time signed and completed by the bidder	
Annexure E: Technical Compliance Sheet signed and completed by the bidder	
Quality Control Plan	

b) In addition to the requirements of section (a) above, Respondents are further required to submit with their Quotations the following **essential Returnable Documents** as detailed below.

Failure to provide all these Returnable Documents may result in a Respondent's disqualification. Respondents are therefore urged to ensure that all these documents are returned with their Quotations.

Essential Returnable Documents	Submitted [Yes or No]
SECTION 2 : Evaluation criteria and list of returnable documents	
- SECTION 4 : RFQ Declaration and Breach of Law Form	
- SECTION 5 : RFQ Clarification Request Form	
- SECTION 6 : Certificate of attendance of Compulsory RFQ Briefing	
- Valid and original, or a certified copy, of your entity's B-BBEE Verification Certification as per the requirements stipulated in Annexure A: B-BBEE Claims Form Note: failure to provide these required documents at the closing date and time of the RFQ will result in an automatic score of zero being allocated for preference	
- Original valid Tax Clearance Certificate [Consortia / Joint Ventures must submit a separate Tax Clearance Certificate for each party]	
Annexure A – B-BBEE Preference Points Claim Form	

CONTINUED VALIDITY OF RETURNABLE DOCUMENTS

The successful Respondent will be required to ensure the validity of all returnable documents, including but not limited to its Tax Clearance Certificate and valid B-BBEE Verification Certificate, for the duration of any contract emanating from this RFQ. Should the Respondent be awarded the contract [**the Agreement]** and fail to present Transnet with such renewals as and when they become due, Transnet shall be entitled, in addition to any other rights and remedies that it may have in terms of the eventual Agreement, to terminate such Agreement forthwith without any liability and without prejudice to any claims which Transnet may have for damages against the Respondent.

Returnable Document

SECTION 3
QUOTATION FORM

I/We_____

Here by offer to supply the goods/services at the prices quoted in the Price Schedule below, in accordance with the conditions related thereto.

I/We agree to be bound by those terms and conditions in:

- the Standard RFQ Terms and Conditions for the Supply of Goods or Services to Transnet; and
- any other standard or special conditions mentioned and/or embodied in this Request for Quotation.

I/We accept that unless Transnet should otherwise decide and so inform me/us, this Quotation [and, if any, its covering letter and any subsequent exchange of correspondence], together with Transnet's acceptance thereof shall constitute a binding contract between Transnet and me/us.

I/We further agree that if, after I/we have been notified of the acceptance of my/our Quotation, I/we fail to deliver the said goods/service/s within the delivery lead-time quoted, Transnet may, without prejudice to any other legal remedy which it may have, cancel the order and recover from me/us any expenses incurred by Transnet in calling for Quotations afresh and/or having to accept any less favourable offer.

Price Schedule

I/We quote as follows for the Service required, at Port of East London in Eastern Cape, excluding VAT:
(To be completed in full)

Item No	Description of Goods /Services	Total Delivered Price (ZAR)
1	Supply and delivery of Plant (Refer to Appendix B)	
2	Testing and Commissioning of Plant (Refer to Appendix B)	
	Total Delivered Price (Excl. VAT)	

Delivery Lead-Time from date of purchase order : _____ [days/weeks]

Returnable Document

Notes to Pricing:

a) All Prices must be quoted in South African Rand, exclusive of VAT

b) To facilitate like-for-like comparison bidders must submit pricing strictly in accordance with this price schedule and not utilise a different format. Deviation from this pricing schedule could result in a bid being disqualified.

c) Price must be fixed for 6 months from the date of the purchase order

Please note that should you have offered a discounted price(s), Transnet will only consider such price discount(s) in the final evaluation stage if offered on an unconditional basis.

By signing this Quotation Form the Respondent is deemed to acknowledge that he/she has made himself/herself thoroughly familiar, and agrees, with all the conditions governing this RFQ, including those contained in any printed form stated to form part hereof, including but not limited to the documents stated below and Transnet SOC Ltd will recognise no claim for relief based on an allegation that the Respondent overlooked any such condition or failed properly to take it into account for the purpose of calculating tendered prices or otherwise:

1. Specifications and drawings included in this RFQ - if applicable, and
2. The following documents all of which are available on Transnet's website or upon request:
   2.1. General Bid Conditions;
   2.2. Standard RFQ Terms and Conditions for the Supply of Goods or Services to Transnet;
   2.3. Supplier Integrity Pact;
   2.4. Non-disclosure Agreement, and
   2.5. Vendor Application Form and all supporting documents (first time vendors only)

   Alternatively, for all existing vendors, please provide vendor number(s) here:

Transnet Operating Division	Unique Vendor Number	Yes / No
Transnet Group		
TFR, etc.		

In the Yes/No column above, please confirm that all the information e.g. company address and contact details, banking details etc. are still correct as at the time of allocation of the vendor number(s). Alternatively, Respondents are required to provide the updated information with their bid submission.

SIGNED at _____ on this _____ day of _____ 20___

SIGNATURE OF WITNESSES ADDRESS OF WITNESSES

1 _____ _____

Name _____ _____

Returnable Document

2 _____ _____

Name _____ _____

SIGNATURE OF RESPONDENT'S AUTHORISED REPRESENTATIVE: _____

NAME: _____

DESIGNATION: _____

Returnable Document

SECTION 4

RFQ DECLARATION AND BREACH OF LAW FORM

NAME OF ENTITY: _____

We _____ do hereby certify that:

1. Transnet has supplied and we have received appropriate responses to any/all questions [as applicable] which were submitted by ourselves for RFQ Clarification purposes;

2. we have received all information we deemed necessary for the completion of this Request for Quotation [**RFQ**];

3. we have been provided with sufficient access to the existing Transnet facilities/sites and any and all relevant information relevant to the Supply of the Goods as well as Transnet information and Employees, and has had sufficient time in which to conduct and perform a thorough due diligence of Transnet's operations and business requirements and assets used by Transnet. Transnet will therefore not consider or permit any pre- or post-contract verification or any related adjustment to pricing, service levels or any other provisions/conditions based on any incorrect assumptions made by the Respondent in arriving at his Bid Price;

4. at no stage have we received additional information relating to the subject matter of this RFQ from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the RFQ documents;

5. we are satisfied, insofar as our entity is concerned, that the processes and procedures adopted by Transnet in issuing this RFQ and the requirements requested from Bidders in responding to this RFQ have been conducted in a fair and transparent manner; and

6. furthermore, we declare that a family, business and/or social relationship **exists / does not exist** [delete as applicable] between an owner / member / director / partner / shareholder of our entity and an employee or board member of the Transnet Group including any person who may be involved in the evaluation and/or adjudication of this Bid.

7. In addition, we declare that an owner / member / director / partner / shareholder of our entity **is / is not** [delete as applicable] an employee or board member of the Transnet Group.

8. If such a relationship as indicated in paragraph 6 and/or 7 exists, the Respondent is to complete the following section:

Returnable Document

FULL NAME OF OWNER/MEMBER/DIRECTOR/
PARTNER/SHAREHOLDER: ADDRESS:

_____

_____

Indicate nature of relationship with Transnet:

_____

_____

[Failure to furnish complete and accurate information in this regard will lead to the disqualification of a response and may preclude a Respondent from doing future business with Transnet]

9. We declare, to the extent that we are aware or become aware of any relationship between ourselves and Transnet [other than any existing and appropriate business relationship with Transnet] which could unfairly advantage our entity in the forthcoming adjudication process, we shall notify Transnet immediately in writing of such circumstances.

BREACH OF LAW

10. We further hereby certify that *I/we* ***have/have not been*** [delete as applicable] found guilty during the preceding 5 [five] years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Respondent is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences. This includes the imposition of an administrative fine or penalty.
    Where found guilty of such a serious breach, please disclose:
    NATURE OF BREACH:
    _____
    _____
    _____
    DATE OF BREACH:_____
    Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Respondent from the bidding process, should that person or entity have been found guilty of a serious breach of law, tribunal or regulatory obligation.

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SIGNED at _____ on this _____ day of _____ 20___

For and on behalf of _____ duly authorised hereto	AS WITNESS:
Name:	Name:
Position:	Position:
Signature:	Signature:
Date:	Registration No of Company/CC _____
Place:	Registration Name of Company/CC _____

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RFQ FOR THE SUPPLY, DELIVERY, TESTING AND COMMISSIONING OF 400 INDUCTION MOTOR AND GEARBOX

ANNEXURE A : B-BBEE PREFERENCE POINTS CLAIM FORM

This preference form contains general information and serves as a claim for preference points for Broad-Based Black Economic Empowerment [**B-BBEE**] Status Level of Contribution.

1. INTRODUCTION

1.1 A total of 10 preference points shall be awarded for B-BBEE Status Level of Contribution.

1.2 Failure on the part of a Bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System [**SANAS**] or a Registered Auditor approved by the Independent Regulatory Board of Auditors [**IRBA**] or an Accounting Officer as contemplated in the Close Corporation Act [**CCA**] together with the bid will be interpreted to mean that preference points for B-BBEE Status Level of Contribution are not claimed.

1.3 Transnet reserves the right to require of a Bidder, either before a Bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by Transnet.

2. GENERAL DEFINITIONS

2.1 **"all applicable taxes"** include value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;

2.2 **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

2.3 **"B-BBEE status of contributor"** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

2.4 **"Bid"** means a written offer in a prescribed or stipulated form in response to an invitation by Transnet for the provision of goods, works or services;

2.5 **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 [Act No. 53 of 2003];

2.6 **"comparative price"** means the price after the factors of a non-firm price and all unconditional discounts that can utilised have been taken into consideration;

2.7 **"consortium or joint venture"** means an association of persons for the purpose of combining their expertise, property, capital, efforts, skills and knowledge in an activity for

the execution of a contract;

2.8 **"contract"** means the agreement that results from the acceptance of a bid by Transnet;

2.9 "**EME**" means any enterprise with an annual total revenue of R5 [five] million or less as per the 2007 version of the B-BBEE Codes of Good Practice and means any enterprise with an annual total revenue of R10 [ten] million or less as per the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928;

2.10 **"firm price"** means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs and excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract;

2.11 **"functionality"** means the measurement according to predetermined norms, as set out in the bid documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a bidder;

2.12 **"non-firm prices"** means all prices other than "firm" prices;

2.13 **"person"** includes reference to a juristic person;

2.14 "**QSE**" means any enterprise with an annual total revenue between R5 [five] million and R35 [thirty five] million as per the 2007 version of the B-BBEE Codes of Good Practice and means any enterprise with an annual total revenue of between R10 [ten] million and R50 [fifty] million as per the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928

2.15 "**rand value**" means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties;

2.16 **"subcontract"** means the primary contractor's assigning or leasing or making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract;

2.17 **"total revenue"** bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Empowerment Act and promulgated in the Government Gazette on 9 February 2007;

2.18 **"trust"** means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person; and

2.19 **"trustee"** means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.

3. ADJUDICATION USING A POINT SYSTEM

3.1 The Bidder obtaining the highest number of total points for the evaluation criteria as enumerated in Section 2 of the RFP will be awarded the contract, unless objective criteria justifies the award to another bidder.

3.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts.

3.3 Points scored will be rounded off to 2 [two] decimal places.

3.4 In the event of equal points scored, the Bid will be awarded to the Bidder scoring the highest number of preference points for B-BBEE.

3.5 However, when functionality is part of the evaluation process and two or more Bids have scored equal points including equal preference points for B-BBEE, the successful Bid will be the one scoring the highest score for functionality.

3.6 Should two or more Bids be equal in all respect, the award shall be decided by the drawing of lots.

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

4.1 In terms of the Preferential Procurement Regulations, 2011, preference points shall be awarded to a Bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of Points [Maximum 10]
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

4.2 Bidders who qualify as EMEs in terms of the 2007 version of the Codes of Good Practice must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EME's with B-BBEE Status Level Certificates.

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4.3 Bidders who qualify as EMEs in terms of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928 are only required to obtain a sworn affidavit on an annual basis confirming that the entity has an Annual Total Revenue of R10 million or less and the entity's Level of Black ownership.

4.4 In terms of the 2007 version of the Codes of Good Practice, Bidders other than EMEs must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.

4.5 The Department of Trade and Industry recently revised the Codes of Good Practice on 11 October 2013 [Government Gazette No. 36928]. The Revised Codes will replace the Black Economic Empowerment Codes of Good Practice issued on 9 February 2007. The Revised Codes provide for a transitional period ending 30 April 2015. During the transitional period, companies may elect to be measured in terms of the Revised Codes or the 2007 version of the Codes. Companies which are governed by Sector-specific Codes will be measured in terms of those Sector Codes.

4.6 As such, Transnet will accept B-BBEE certificates issued based on the Revised Codes. Transnet will also continue to accept B-BBEE certificates issued in terms of the 2007 version of the Codes provided it was issued before 1 May 2015. Thereafter, Transnet will only accept B-BBEE certificates issued based on the Revised Codes.

4.7 In terms of the Revised Codes of Good Practice, Bidders who qualify as QSEs must comply with all the elements of B-BBEE for the purposes of measurement. QSEs that are at least 51% or 100% Black owned are only required to obtain a sworn affidavit on an annual basis confirming that the entity has an Annual Total Revenue of R50 million or less and the entity's Level of Black ownership. Large enterprises must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.

4.8 A trust, consortium or joint venture will qualify for points for its B-BBEE status level as a legal entity, provided that the entity submits its B-BBEE status level certificate.

4.9 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate bid.

4.10 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialised scorecard contained in the B-BBEE Codes of Good Practice.

4.11 A person will not be awarded points for B-BBEE status level if it is indicated in the Bid

documents that such a Bidder intends subcontracting more than 25% [twenty-five per cent] of the value of the contract to any other enterprise that does not qualify for at least the same number of points that such a Bidder qualifies for, unless the intended subcontractor is an EME that has the capability and ability to execute the subcontract.

4.12 A person awarded a contract may not subcontract more than 25% [twenty-five per cent] of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is subcontracted to an EME that has the capability and ability to execute the subcontract.

4.13 Bidders are to note that in terms of paragraph 2.6 of Statement 000 of the Revised Codes of Good Practice issued on 11 October 2013 in terms of Government Gazette No. 36928, any representation made by an entity about its B-BBEE compliance must be supported by suitable evidence or documentation. As such, Transnet reserves the right to request such evidence or documentation from Bidders in order to verify any B-BBEE recognition claimed.

5. B-BBEE STATUS AND SUBCONTRACTING

5.1 **Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:**

B-BBEE Status Level of Contributor _____ = _____ [maximum of 20 points]

Note: Points claimed in respect of this paragraph 5.1 must be in accordance with the table reflected in paragraph 4.1 above and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or a sworn affidavit in the case of an EME or QSE.

5.2 **Subcontracting:**

Will any portion of the contract be subcontracted? YES/NO [delete which is not applicable]

If YES, indicate:

(i) What percentage of the contract will be subcontracted? .....%

(ii) The name of the subcontractor .....

(iii) The B-BBEE status level of the subcontractor .....

(iv) Is the subcontractor an EME? YES/NO

5.3 Declaration with regard to Company/Firm

(i) Name of Company/Firm.....

(ii) VAT registration number.....

(iii) Company registration number.....

(iv) Type of Company / Firm [TICK APPLICABLE BOX]

☐Partnership/Joint Venture/Consortium

☐One person business/sole propriety

☐Close Corporations

☐Company (Pty) Ltd

(v) Describe Principal Business Activities

.....

.....

.....

(vi) Company Classification [TICK APPLICABLE BOX]

☐Manufacturer

☐Supplier

☐Professional Service Provider

☐Other Service Providers, e.g Transporter, etc

(vii) Total number of years the company/firm has been in business.....

BID DECLARATION

I/we, the undersigned, who warrants that he/she is duly authorised to do so on behalf of the company/firm, certify that points claimed, based on the B-BBEE status level of contribution indicated in paragraph 4 above, qualifies the company/firm for the preference(s) shown and I / we acknowledge that:

(i) The information furnished is true and correct.

(ii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 6 above, the contractor may be required to furnish documentary proof to the satisfaction of Transnet that the claims are correct.

(iii) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, Transnet may, in addition to any other remedy it may have:

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) restrict the Bidder or contractor, its shareholders and directors, and/or associated entities, or only the shareholders and directors who acted in a fraudulent manner, from obtaining business from Transnet for a period not

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exceeding 10 years, after the *audi alteram partem* [hear the other side] rule has been applied; and/or

(e) Forward the matter for criminal prosecution.

WITNESSES:

1. .....

2. .....

SIGNATURE OF BIDDER

DATE:.....

COMPANY NAME:

.....

ADDRESS:.....

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RFQ FOR THE SUPPLY, DELIVERY, TESTING AND COMMISSIONING OF 400 INDUCTION MOTOR AND GEARBOX

Section 6: RFQ CLARIFICATION REQUEST FORM

RFQ No: RME CPT/ 404/2016

RFQ deadline for questions / RFQ Clarifications: Before 12:00 on 13 May 2016

TO:	Transnet SOC Ltd
ATTENTION:	Tshegofatso Shaku
EMAIL	[Tshegofatso.Shaku@transnet.net]
DATE:	_____
FROM:	_____
	_____

RFQ Clarification No *[to be inserted by Transnet]* .....

REQUEST FOR RFQ CLARIFICATION