



**DEPARTMENT OF WATER AND SANITATION  
REPUBLIC OF SOUTH AFRICA**

DUE AT 11:00 ON

6 June 2019

**TENDER DWS 04-0419 WTE**

**FOR THE DESIGN, MANUFACTURE, SUPPLY, DELIVERY TO SITE,  
INSTALLATION AND COMMISSIONING OF:**

**ONE PASSENGER LIFT,  
COMPLETE WITH GUIDE RAILS, OPERATING SYSTEM AND MAINTENANCE  
CONTRACT**

FOR

**OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT:  
DE HOOP DAM**

**DISTRICT SEKHUKHUNE**

**LIMPOPO PROVINCE**

**SUBMIT TENDER DOCUMENT**

TO

POSTAL ADDRESS:  
DIRECTOR-GENERAL: WATER AND SANITATION  
PRIVATE BAG X 313  
PRETORIA, 0001

OR

**TO BE DEPOSIT IN:**  
THE TENDER BOX AT THE ENTRANCE  
OF ZWAMADAKA BUILDING  
157 SCHOEMAN STREET  
PRETORIA, 0002

**TENDERER:** (Company address and stamp)

**COMPILED BY:  
DEPARTMENT OF WATER AND SANITATION:**

**DIRECTORATE: MECHANICAL AND ELECTRICAL ENGINEERING**

**OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT:**

**DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

**ENQUIRIES:** Director: Mechanical & Electrical Engineering  
("The Engineer") Department of Water and Sanitation  
Room 334  
Sedibeng Building  
185 Schoeman Street  
PRETORIA

Private Bag X313  
PRETORIA  
0001

**COMPILED BY:** J.S. Potgieter  
Sub-directorate Mechanical Design  
  
Tel: (012) 336-8342; 082 809 0726  
Fax: (012) 336-8330

**APRIL 2019**



**DEPARTMENT OF WATER AND SANITATION**

**TENDER DWS 04-0419 WTE**

**SCHEDULE OF DOCUMENTS**

**THIS TENDER COMPRISES THE FOLLOWING DOCUMENTS:**

			<b>PAGE COLOUR</b>
1.	SECTION 1	PREFACE .....	WHITE
2.	SECTION 2	INSTRUCTIONS TO TENDERERS .....	YELLOW
3.	SECTION 3	GENERAL CONDITIONS OF CONTRACT .....	PINK
4.	SECTION 4	ADMINISTRATIVE FORMS .....	WHITE
5.	SECTION 5	PROJECT SPECIFICATION .....	BLUE
6.	SECTION 6	PARTICULAR SPECIFICATIONS .....	GREEN
7.	SECTION 7	TECHNICAL SCHEDULES .....	WHITE
8.	SECTION 8	BILL OF QUANTITIES AND PRICING .....	WHITE
9.	SECTION 9	DIAGRAMS AND TECHNICAL DRAWINGS .....	WHITE

# **OLIFANTS RIVER WRDP DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

## **SECTION 1: PREFACE**

## **SECTION 1: PREFACE**

This Tender calls for the design, manufacture, supply, delivery to Site, installation and commissioning of the equipment and ancillaries as indicated below and as specified in Particular Specification DHP 47 in Section 6 of this Tender Document and generally as shown on the Drawings included. The Site shall be the OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT, DE HOOP DAM in the Limpopo Province.

The following equipment is included in this Tender:

One electrically operated general-purpose passenger lift complete with rails, electric motor, all switch-and control gear, operating in the lift shaft of De Hoop Dam. A maintenance contract as specified shall also be included in the supply.

The materials used for the manufacture of the passenger lift will be mainly mild steel and stainless steel.

The complete installation and commissioning at Site of all equipment are included in this Tender.

From Pretoria (or Johannesburg) the shortest route is via the N4 (or N12) to Middelburg, turning off onto route R555 to Steelpoort. From the R555 the access to Site is shown on the attached route map (See Section 9 of Tender Document). Tenderers shall take note of the fact that stretches of the R555 road is in a very poor condition.

The various delivery dates shall be in accordance with Clause DHP 47.1.4 of Particular Specification DHP 47 in Section 6 of this Tender Document.

## **EVALUATION CRITERIA**

The 80/20 preference points system as prescribed in the Preferential Procurement Regulations, 2017 Pertaining to the Preferential Procurement Policy Framework Act, (ACT NO 5 OF 2000) (PPPFA) will be applied to evaluate this bid. The lowest acceptable bid will score 80 points for price and a maximum of 20 points will be awarded for attaining the Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution. Bids received will be evaluated on the three (3) phases namely **Mandatory Requirements, Functionality Compliance and Price and Preference.**

### **Administrative Compliance**

Bidders are required to comply with the following listed below:-

- Tax compliant with SARS (To be verified by CSD and SARS).
- Completion, signing and submission of SBD forms with the bid documents (SBD1, SBD3.1, SBD3.2, SBD4, SBD6.1, SBD8 and SBD9).
- Active registration with Companies and Intellectual Property Commission (CIPC), to be verified on CSD.
- Provide technical brochures with full technical specifications of all equipment offered under this Bid
- Complete technical schedules as attached to Tender Specification.
- Completion of "Form of Tender", "Appendix to Form of Tender", "Annexures A, B, C, D, F, G".

### **Phase 1: Mandatory Requirements / Documents.**

Failure to submit any of the documents listed below will render your bid non-responsive and you will be disqualified.

- Active registration and valid minimum grading with the Construction Industry Development Board of CIDB 4SI or above.
- Attend Compulsory Briefing Session.

### **Phase 2: Technical Compliance.**

Bidders must score at least **65 out of 100** in respect of functionality in order to qualify for advancement to Phase 3. A bidder that scores less than **65 out of 100** will be regarded as submitting a non-responsive bid and will be disqualified. Bidders who fail to obtain a minimum score for each criterion will be disqualified.

The weight that will be allocated to each functionality criteria as follows(unless otherwise stated):

**1 = poor, 2 = average, 3 = good, 4 = very good, and 5 = excellent**

The evaluators are to score the bidder on a scale of 1 to 5 and use the scored value to determine the archived weight of the criterion.

Criteria	Sub-Criteria	Points Value	Weight of Criterion	Bidder Score
<b>Ability and Capability</b>	Demonstrated skills and experience of each key personnel for this project; for example but not limited to, contracts administrator, site supervisor, site foremen, engineers, health and safety and environmental representatives (Complete "Annexure G").		15	
<b>Company Experience</b>	11 or more	5	10	
	8-10 years	4		
	5-7 years	3		
	2-4 years	2		
	Less than 2 years	1		
<b>Methodology</b>	Project plan and broad methodologies in line with the task descriptions outlined under project scope/task description and technical specifications and schedules, with clear milestones, installation methods and timeframes for each task to be completed (Complete form "Appendix To Form Of Tender").		15	
	Excellent – significantly above requirements	5		
	Very Good – above requirements	4		
	Good – meets requirements	3		
	Inadequate – below requirements	2		
	Poor – significantly below requirements	1		
<b>Similar Work Undertaken</b>	List of work of similar nature to that contained in this Contract (Complete "Annexure B").		15	
<b>Technical Schedules</b>	Information contained in Technical Schedules demonstrate equipment of high quality, according to the Specification.		45	
	Excellent – significantly above requirements	5		
	Very Good – above requirements	4		
	Good – meets requirements	3		
	Inadequate – below requirements	2		
	Poor – significantly below requirements	1		
<b>TOTAL</b>			100	

**Phase 3: 80/20 Principle will be applied in terms of the new Preferential Procurement Regulations, 2017 pertaining to the PPPFA Act no 5 of 2000.**

During this phase, bidders will be further evaluated based on 80points for price and 20 points for attaining the B-BBEE Status Level of Contributor in accordance with the table in SBD 6.1

In order to claim the B-BBEE Status Level of Contributor points, bidders must submit original and valid B-BBEE Status Level Verification Certificates or certified copies thereof, issued by accredited Verification Agency/s by SANAS or Registered Auditor approved by Independent Regulatory Board of Auditor (IRBA), together with their bids to substantiate their B-BBEE rating claims. The Exempted Micro Enterprise must submit a letter from the Accounting Officer who is appointed in terms of Close Corporation Act. EMEs are allowed to submit a sworn affidavit obtainable from the Department of Trade and Industry website.

Bidders who do not submit B-BBEE Status Level Verification Certificates or are non-compliant contributors to B-BBEE do not qualify for preference points for B-BBEE but will not be disqualified from the bidding process. They will score points out of 80 for price only and zero (0) points out of 20for B-BBEE.

**FOR ENQUIRIES**

**FURTHER TECHNICAL INFORMATION:** queries and questions of clarity can be addressed to Mr J.S Potgieter as follows: Tel: 012 336 8342 email: [potgieterj@dwa.gov.za](mailto:potgieterj@dwa.gov.za) The **Bid number and the subject name** of this Bid should be clearly identified on the subject line when an enquiry is made.

**OLIFANTS RIVER WRDP  
DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

**SECTION 2:  
INSTRUCTIONS TO TENDERERS**





**REPUBLIC OF SOUTH AFRICA**  
**DEPARTMENT OF WATER AND SANITATION**  
**INSTRUCTIONS TO TENDERERS**

1. All recipients of these tender documents, whether they submit a Tender or not, shall treat the details of the documents as PRIVATE AND CONFIDENTIAL.

2. **ISSUE OF DOCUMENTS**

Two complete sets of tender documents with drawings are issued to each Tenderer against a deposit (if required) of the amount stated in these documents. This deposit shall be paid when making application for the documents from the Director-General, Tender Section, Department of Water And Sanitation, Zwa Madaka Building entrance, 157 Francis Baard Street, Pretoria, or Private Bag X313, Pretoria, 0001.

All payments and deposits shall be made in the currency of the Republic of South Africa and cheques shall be made payable to the Director-General: Water And Sanitation, who shall be entitled to cash any cheque.

The tender deposit is none refundable.

Any amendments to published tender documents will be forwarded by certified mail only to those Tenderers who requested tender documents from the Department. Tenderers shall indicate in the space provided on the Appendix to Form of Tender and / or the Technical Schedules which, if any, amendments they have received.

3. **ADDITIONAL INFORMATION**

- 3.1 Tenderers are referred to "Government Directives With Regard to Procurement" - obtainable from the office of the Chief Director: Supply Chain Management, Private Bag X 313, Pretoria, 0001, and which shall be regarded as an integral part of these tender documents.

The conditions contained in Government Directives With Regard to Procurement shall apply unless they are in conflict with any portion of the Instructions to Tenderers, Conditions of Contract, Specifications, Appendices, Annexures, and Schedules of this enquiry document, in which case this enquiry document shall take precedence.

Tenderers are also referred to the Departmental General Conditions of Contract as more fully explained under "CONDITIONS OF CONTRACT".

- 3.2 Tenderers shall acquaint themselves with the nature of the Site, rail facilities and road conditions and with all conditions and circumstances that may affect their Tenders, and shall be deemed to have knowledge thereof.

If an official site inspection is to be held, it will be specified in the Project Specification, and the site inspection certificate included in these documents shall be completed.

- 3.3 If any additional information is required as to the interpretation of any part of this enquiry, immediate application should be made to the Engineer.

4. **CONDITIONS OF CONTRACT**

- 4.1 All Tenderers shall be deemed to have waived, renounced and abandoned any conditions printed or written upon any stationery used by them for the purpose of or in connection with the submission of tenders which are in conflict with the conditions laid down in the Tender Documents.

- 4.2 No alteration, amendment or variation of the Conditions of Contract will be permitted and, in the event of any such alterations, amendments or variations being stipulated as a condition of tender by the Tenderer, the Tender will be rendered invalid and will not be considered.

- 4.3 Tenderers shall comply strictly with the Conditions of Contract, Enquiry Specification, Appendices, Annexures, Schedules and Forms forming this enquiry document. Tenders which, in the opinion of the Employer, do not so comply will not be considered in the selection of the successful Tenderer.

- 4.4 Any Tenderer who has duly submitted an offer which in all respects complies with the Specification may, at his own initiative, also submit an ALTERNATIVE OFFER at the same time or any time prior to the closing time of tenders. Provided that the Tenderer's offer to specification is acceptable to the Engineer in every respect, his alternative offer may also be considered for purposes of the award of the Contract. Any deviation from specification or alternative condition of tender must be clearly stated and any saving or additional expenditure for the State brought about by each deviation or alternative proposal must be quantified in the tender documents.

If a Tenderer wishes to submit alternative tenders, two separate complete sets of Schedules, Forms, etc., shall be filled in and submitted in respect of each alternative Tender, clearly marked "Alternative A" or "Alternative B" etc.

Details of all departures from, or modifications to the Specification, in the case of alternative Tenders, shall be clearly stated in Annexure A.

- 4.5 If the Tenderer is a supplier but not the actual manufacturer and will be sourcing the product(s) from another company, a letter from that company(ies)/supplier(s) confirming firm supply arrangement(s) in this regard, has to accompany the Tender and failure to submit the document, may invalidate the Tender.

## 5. GENERAL REQUIREMENTS

- 5.1 Wherever required the Tenderer shall state all statutory costs included in his tender price. The Contract will not be exempt from ruling Value Added Tax.

Tenderers shall allow in their Tenders for all labour, materials, machinery and everything necessary for the execution and completion of the Contract in accordance with the Tender Documents. No alteration may be made in the Form of Tender, Price Schedules or other documents, and the Tender will be deemed to comply entirely with the terms of the documents.

An addition to the Price Schedules is permissible to cover any item which the Tenderer regards as technically essential and which he considers has otherwise been omitted from the Schedule. Full technical details shall be given in a covering letter.

- 5.2 The Tenderer shall give details in the Annexure to Price Schedules of all importing costs on which the Contract Price is based together with a schedule of importing charges and rates of exchange ruling at the date of tender.
- 5.3 Tenderers may submit with their Tender a statement of work previously carried out by them, to facilitate the adjudication of the Tender, by completing Annexure B.
- 5.4 Tenderers shall submit with their Tenders the names and addresses of the principal Subcontractors which they propose to employ and the section of the Works on which they would be employed by completing Annexure C.
- 5.5 Notwithstanding any information that may be contained in any covering letter, Maker's specification, technical literature, or other documents accompanying the Tender, the attached Schedules shall be completed in full at the time of tendering.

All spaces in the Standard Bid Documents (SBD Forms) and other Annexures shall be completed in full. The Price Schedules annexed shall be fully priced out and the summary thereof filled in on the Tender Form.

The Form of Agreement, Form of Performance Bond and Form of Manufacture Payment Bond are NOT to be completed at the time of tendering.

The tender documents shall NOT be separated in any way nor shall any pages be detached from the original documents.

- 5.6 Tenderers shall submit with their Tenders an outline programme of works on the Appendix to Form of Tender. Within 4 weeks of receipt of order, the successful Tenderer shall submit a detailed Programme of Works.
- 5.7 The tender offer shall comprise two copies of the following:
- 5.7.1 Tenderer's covering letter, if any, otherwise Tenderer's name and address.
- 5.7.2 All data sheets, illustrative literature and Tenderer's drawings as required by these tender documents.
- 5.7.3 These tender documents, duly completed in full and signed as required in clause 7 of these instructions.
- 5.7.4 For administrative purposes, Tenderers are requested to photostat their completed FORM OF TENDER and enclose the loose copy inside the front cover of their tender document.

## 6. PREFERENCE FOR GOODS MANUFACTURED OR ASSEMBLED LOCALLY

- 6.1 The Tenderer shall complete and sign the appropriate Affidavits on the Declaration Certificate for Local Production and Content, Form SBD 6.2. Tenderers are required to state the value of plant, equipment or components manufactured in South Africa to enable the local content of goods to be determined. Unless this information is correctly given Tenders may be disqualified.

## 7. SIGNATURES

- 7.1 The Tender shall be signed on all the forms included in this Tender wherever indicated, including the forms annexed hereto with all blanks in the Tender, Appendices, Annexures and Schedules filled in. Failure to do so may invalidate the offer.
- 7.2 The Tender, if by an individual, shall be signed by that individual or by someone on his behalf duly authorised thereto and proof of such authority must be produced. If the Tender is by a company it shall be signed by a person or persons duly authorised thereto by a Resolution of a Board of Directors, a copy of which Resolution, duly certified by

the Chairman of the Company shall be submitted with the tender documents. If the Tender is submitted by a joint venture of more than one person and/or companies and/or firms it shall be accompanied by the following:

- 7.2.1 The original or a notarially certified copy of the original document under which such joint venture was constituted which must define precisely inter alia the conditions under which the joint venture will function, its period of duration and the participation of the several constituent persons and/or companies and/or firms.
- 7.2.2 A certificate signed by or on behalf of each participating person and/or company and/or firm authorising the person who signed the Tender to do so.

## 8. SUBMISSION

- 8.1 Two copies of the Tender Documents shall be duly completed, signed and submitted as follows:

- 8.1.1 The original Tender, together with the covering letter and supporting documents, shall be sealed in an envelope endorsed:

"ORIGINAL TENDER FOR TENDER W/WF \_\_\_\_\_

DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

and the name of the Tenderer shall be clearly shown."

- 8.1.2 The duplicate copy of the Tender, together with duplicate copies of the covering letter and supporting documents, shall be sealed in a separate envelope endorsed:

"DUPLICATE OF ORIGINAL TENDER FOR TENDER W/WF \_\_\_\_\_

DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

and the name of the Tenderer shall be clearly shown."

- 8.1.3 Both the "Original" and "Duplicate" copies of the Tender, each in their separate sealed envelopes, shall be placed in a single sealed envelope endorsed:

"ORIGINAL TENDER FOR TENDER W/WF \_\_\_\_\_

and the name of the Tenderer shall be clearly shown."

- 8.2 Tenders in duplicate, sealed and endorsed as above, will be received by: See front cover of this document not later than 11:00 on the date stipulated.

- 8.3 The additional copy of the Tender Documents may be retained by the Tenderer for his records.

- 8.4 Tenders by telegraph or fax will not be accepted. Late Tenders will be rejected.

NOTE: Tenderers are strongly advised to deliver Tenders well before the deadline, as under NO CIRCUMSTANCES will any late Tender be accepted.

## 9. ADJUDICATION

- 9.1 Tenders shall hold good and remain valid for acceptance for a period of 90 days commencing as from the closing time and date for tender offers.

- 9.2 The Employer reserves the right to adjust any arithmetical or other patent errors in the Tender. Any adjustments in this respect made by the Engineer to the Tender will be communicated to the Tenderer prior to the acceptance of the Tender.

- 9.3 The Employer does not bind himself to accept the lowest or any Tender nor to assign any reason for the rejection of a Tender and may if he so desires divide the Contract between any two or more Tenderers and will not be held liable for any expense incurred in submitting Tenders.

- 9.4 Tenders, where the prices tendered for erection and site testing are less than  $\frac{2}{3}$  the average of the comparative tendered prices of the remaining Tenders for the same item, will be rejected.
- 9.5 The Tenderer shall, within 7 days from the date on which he was requested to do so, submit a full report on his financial standing from his banker. The Department may, in its discretion condone any failure to comply with the foregoing condition.

The Department also reserves the right to approach the Tenderer's banker or guarantor(s) as indicated in the tender document, with a view to ascertaining whether the required guarantee will be furnished.



**OLIFANTS RIVER WRDP  
DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

**SECTION 3:  
PART I:  
GENERAL CONDITIONS OF  
CONTRACT**

**PART II:  
PARTICULAR CONDITIONS OF  
CONTRACT**

**PART III:  
APPENDIX TO TENDER**

**(SEE SECTION 4: ADMINISTRATIVE FORMS)**

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**CONDITIONS OF CONTRACT FOR  
SUPPLY AND INSTALLATION OF  
GENERAL MECHANICAL AND ELECTRICAL WORKS**

## **SUPPLY AND INSTALLATION OF GENERAL MECHANICAL AND ELECTRICAL WORKS**

### **CONDITIONS OF CONTRACT**

#### **PART I - GENERAL CONDITIONS**

The Conditions of Contract comprise Part I – “General Conditions” – which form part of the “Conditions of Contract for “Plant and Design – Build for Electrical and Mechanical Works and for Building and Engineering Works Designed by the Contractor” First Edition 1999 published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC) and the following Part II – “Particular Conditions”, which include amendments and additions to such General Conditions.



**SUPPLY AND INSTALLATION OF  
GENERAL MECHANICAL AND ELECTRICAL WORKS**

**CONDITIONS OF CONTRACT**

**PART II - PARTICULAR CONDITIONS  
(REVISION 0)**

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## CONDITIONS OF CONTRACT

### PART II - PARTICULAR CONDITIONS (REVISION 0)

#### CLAUSE 1 - GENERAL PROVISIONS

##### Sub-Clause 1.1.1 – The Contract

1.1.1.3.1 **“Letter of Acceptance”** – in the third line of the definition after the words “...and signed by both Parties...” add the words “... and which combined annexed memoranda shall be termed the Memorandum of Understanding”.

1.1.1.5 **“Employer’s requirements”** delete the text of this Sub-Clause and replace with: “.....means the relevant clauses or sections in the Tender documents, and any additions and modifications to such clauses or sections in accordance with the Contract, specifying the purpose, scope and/or design and/or other technical criteria for those elements of the Scope of the Works which are to be designed by the Contractor.”

Add the following new sub-clauses:

##### Sub-Clause 1.1.2 – Parties and Persons

At the end of Sub-Clause 1.1.2 add the following:

“1.1.2.11 **“Authorised Signatory”** means a person who is a Director or other Officer of the Employer, Engineer or Contractor, who is authorised to sign or countersign, on behalf of and by so doing to commit their respective company, organisation or joint venture.

##### Sub-Clause 1.2 – Interpretation

Add the following after sub-paragraph (d):

“(e) In these Conditions, provisions including the expression **“Cost plus reasonable profit”** require this profit to be one twentieth (5%) of this Cost.

##### Sub-Clause 1.3 – Communication

Delete first paragraph and replace with:

“All communications shall be:”

Add the following to the end of sub-paragraph (a), before “...;and...” “...,except that any Notice issued in terms of the Contract by the Contractor to the Engineer or vice versa shall not be issued via electronic transmission...”

##### Sub-Clause 1.5 – Priority of Documents

Delete the documents listed (a) to (h) and substitute:

- “(a) the completed Contract Agreement,
- (b) the Letter of Acceptance (including Memorandum of Understanding),
- (c) the completed Letter of Tender and Appendix to Tender,
- (d) the Conditions of Contract Part II – Particular Conditions,
- (e) the Conditions of Contract Part I – General Conditions,
- (f) the Environmental Management Plan, if applicable,



- (g) Employer's Requirements,
- (h) the Drawings, if applicable,
- (i) the Price Schedules,
- (j) the completed Tender Schedules,
- (k) the Contractors' Proposal and any other documents forming part of the Contract.

All Addenda and the Memorandum of Understanding, if any, which modify the terms of the Tender Documents take precedence only over the document to which they relate."

#### **Sub-Clause 1.8 – Care and Supply of Documents**

In paragraph one, line three, delete "...six copies of each of the Contractor's Documents..." and replace with "...one plastic film transparency and four paper prints of all Drawings, and four copies of each of the Contractor's Documents, but in the case of Drawings one plastic film transparency copy and four paper print copies shall be similarly supplied. The Contractor may submit electronic copies of the Contractor's Documents and Drawings subject to agreement by the Engineer."

In the last paragraph, last line, after the word "...Party..." add the words "...and the Engineer..."

Add to the end of the last paragraph "...and the Engineer shall issue any necessary clarification or instruction."

#### **Sub-Clause 1.12 – Confidential Details**

Add the following paragraph after the first paragraph:

"The Contractor shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out obligations under it or to comply with applicable Laws. The Contractor shall not publish, permit to be published, or disclose any particulars of the Works in any trade or technical paper or elsewhere without the previous agreement of the Employer."

### **CLAUSE 2 – THE EMPLOYER**

#### **Sub-clause 2.4 – Employer's Financial Arrangements**

Delete this sub-clause.

#### **Sub-clause 2.5 – Employer's Claims**

In the second paragraph delete the words "...after the Employer became aware..." and replace with "..., and not later than 28 days after the Employer became aware, or should have become aware,..."

### **CLAUSE 3 – THE ENGINEER**

#### **Sub-Clause 3.1 – Engineer's Duties and Authority**

At the end of Sub-Clause 3.1, add the following:

- "(d) If the Engineer is not the Department of Water and Sanitation, he is in terms of his appointment by the Employer required to obtain the specific approval of the Employer for the execution of the following:
  - (a) The issuing of an order to suspend the progress of the Works, the extra costs resulting from which order is to be borne by the Employer in terms of Sub-Clause 8.9. [*Consequences of Suspension*]

- (b) The issuing of an order to vary the Works in terms of Clause 13 [*Variations and Adjustments*], the estimated effect of which will be to increase the Contract Price by an amount exceeding R200 000-00.
- (c) The approval or rejection of any claim by the Contractor."

Provided that such approval by the Employer shall not be required for instructions or notices which, in the sole opinion of the Engineer, are required to meet an emergency, relating to safety or security of the works or of any person or property, or are otherwise required to ensure the safety or security of the Works or of any person or property.

- (e) Where the Engineer, as defined in Sub-Clause 1.1.2.4, is not a single named individual, the Engineer shall within 7 days of the date of the Letter of Acceptance, and in any event before the Commencement Date, notify to the Contractor in writing the name of the individual whom the Employer has agreed will act on behalf of the Engineer and the detailed delegation of Authority granted to that individual. The Engineer shall thereafter, in like manner, after receiving the authority of the Employer, notify the Contractor of any replacement of the named individual and/or any changes to such delegation. Such replacement or change shall not take effect until such notification has been received by the Contractor.

### **Sub-Clause 3.2 – Delegation by the Engineer**

In the first paragraph, delete the last sentence and replace with:

"Unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to finally determine any matter in accordance with Sub-Clause 3.5 [*Determinations*]."

In the last paragraph, delete the contents of sub-paragraph (b) and replace with:

"if the Contractor questions any determination, instruction, opinion or valuation of an assistant, the Contractor shall refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination, certificate, instruction, opinion or valuation."

## **CLAUSE 4 – THE CONTRACTOR**

### **Sub-Clause 4.1 – Contractor's General Obligations**

At the end of the fifth paragraph add:

"The Engineer shall comment on these proposals to the Contractor within 28 days or as agreed with the Contractor."

Add the following paragraph:

"The Contractor shall attend meetings that the Engineer considers necessary to facilitate the Works."

### **Sub-Clause 4.2 – Performance Security**

Replace the second paragraph of Sub-Clause 4.2 with:

"The Contractor shall deliver the Performance Security to the Employer within 14 days of the date of issue of the Letter of Acceptance. The Performance Security shall be issued by a bank registered in terms of the Banks Act, 1965 (Act no. 23 of 1965) or from an insurer registered in terms of the Insurance Act, 1943 (Act no. 27 of 1943) and approved by the Employer and having an office or banking facility in the Republic of South Africa. The Performance Security shall be subject to approval by the Employer and shall be in the form prescribed in the tender documents."

Replace the first sentence of the third paragraph with:

"The Performance Security shall be valid until the issue of the Taking-Over Certificate of the Works as a whole."

Replace "Performance Certificate" with "Taking-Over Certificate" in the fourth line of the third paragraph.

Replace "Performance Certificate" with "Taking-Over Certificate" in the last paragraph.

#### **Sub-Clause 4.8 – Safety Procedures**

In sub-paragraph (a) insert the words "...laws and..." before "...regulations..."

#### **Sub-Clause 4.17 – Contractor's Equipment**

Add the following paragraph:

"Where the words "plant" and "construction plant" are used in the Specifications, they shall have the same meaning as "Contractor's Equipment".

#### **Sub-Clause 4.18 – Protection of Environment**

Add the following to the first paragraph:

"and shall ensure compliance with all the environmental requirements of the project specifications."

#### **Sub-Clause 4.21 – Progress Report**

Add the following new sub-paragraphs:

- " (i) Unpriced copies of all orders for major equipment items and contracts for the information of the Engineer.
- (j) Updated programme indicating report time line in hard copy and electronic copy including all updates."

Add the following paragraph at the end of the sub-clause:

"The Contractor shall provide a "Close-Out" report which shall contain the following:

- (i) An agreed summary of the information provided under items listed under this clause
- (ii) Contractor's Documents as described under Sub-Clause 1.1.6.1
- (iii) Any other documents specified under the Specification
- (iv) A data book that shall contain vendor data (Technical) and/or all test and taking-over certificates, manuals, ceded or ongoing guarantees, and other similar records forming a record of the important issues relative to the Contract."

#### **Sub-Clause 4.22 – Security of Site**

Add the following paragraph:

"(c) the Contractor shall be responsible for the protection of his personnel and property, the Engineer's personnel and property and the Works against criminal elements."

#### **Sub-Clause 4.25 – Promotional Material**

The Contractor shall not exhibit or permit to be exhibited any advertisement on the Works, Site, constructional plant or temporary Works. All notices on Site shall be subject to the approval of the Engineer before erection and shall be immediately removed if the Engineer so requires. The Contractor shall not use the name of this, or any other Project related to the Department of Water and Sanitation, or any illustration of the scheme or personnel therein for advertisement purposes without the prior written authority of the Employer, which will not be unreasonably withheld.

### **CLAUSE 5 – DESIGN**

#### **Sub-Clause 5.2 – Contractor's Documents**

Add the following new Paragraph between Paragraphs 3 and 4.



Within 28 days of the issue of the Letter of Acceptance, the Contractor shall commence to submit the Contractor's Documents for the Engineer's Approval, as required. The Contractor shall continue to make submissions at a reasonable rate so that all the Contractor's Documents are completed within a further 56 days or in accordance with a programme to be approved by the Engineer.

## **CLAUSE 6 – STAFF AND LABOUR**

### **Sub-Clause 6.3 – Persons in Service of the Employer**

Delete Clause 6.3 in its entirety and replace with:

"Save by mutual agreement in writing the Contractor shall for the duration of the Contract be debarred from employing or offering employment incidental to any duties under the Contract to any person in the employ of the Employer or the Engineer and similarly the Employer and the Engineer shall for the duration of the Contract be debarred from employing or offering employment incidental to any duties under the Contract to any person in the employ of the Contractor."

## **CLAUSE 7 – PLANT, MATERIALS AND WORKMANSHIP**

### **Sub-Clause 7.4 – Testing**

Insert the following new paragraph at the end of the sub-clause:

"Where completion in sections has been specified for any section of the Works then a test or tests as determined in negotiation with the Contractor, or failing such agreement, determined by the Engineer, will be required to be undertaken. Such Tests on Practical Completion of the Works may include some or all of the pre-commissioning tests specified for the Works. However it may be necessary to repeat some such pre-commissioning tests at the stage of the pre-commissioning of the Works or the Project Works at the discretion of the Engineer. Such Tests on Practical Completion are to determine that the works can safely undertake the next stage of testing."

### **Sub-Clause 7.5 – Rejection**

After the last paragraph add the following new paragraph:

"If, despite the Engineer's rejection of Plant, Materials or Workmanship as above, the Employer decides at his discretion, having regard to the circumstances of the specific case only, to accept the item of work for any reason, such concession will not constitute any precedent nor detract in any other way from the Contract or Contractor's obligations and responsibilities for otherwise full compliance. In this event, the concession will be made subject to a reduced payment for the Plant, Materials or Workmanship as determined by the Engineer in accordance with Sub-Clause 3.5. Such concession will be without prejudice to the Employer's rights and the Contractor's obligations under the Contract and such determination will not be subject to Clause 20 and if the Contractor does not accept the Engineer's determination, the item of work will be treated under Sub-Clause 7.6."

### **Sub-Clause 7.6 – Remedial Work**

At the end of sub-paragraph (c) add:

"(d) carry out at the Contractor's expense any additional work required to obviate the need to remove, replace, re-execute or re-design any work which due to the Contractor's default is not in accordance with the Contract so that the same may be retained."

## **CLAUSE 8 – COMMENCEMENT, DELAYS AND SUSPENSION**

### **Sub-Clause 8.1 – Commencement of Work**

Replace "42 days" with "28 days" in the third line of the first paragraph.

### **Sub-Clause 8.3 – Programme**

Between the second and third last paragraphs, add the following new paragraph:

"Any float included in the Contractor's programme is available to the Contractor to assist in the attainment of the programme for the Work. Such float shall, however, be taken account of by the Engineer in assessing and managing the duration and progress of the Works and the Contractor shall co-operate with the Engineer in that regard and in the beneficial use of such float to the advantage of the project. Where there is remaining float in the programme at the time of an Employer Risk event as defined in Sub-clause 17.3, an extension of time shall only be granted to the extent that the associated delay is predicted by the Engineer, after consultation with each Party, to reduce to below zero the total float on the activity paths affected by the delay."

Add the following paragraphs:

"The programme must be submitted in bar chart format. If applicable, expected interface dates with other Contractors are to be shown."

Where the Engineer, in accordance with Sub-clause 8.13, orders in writing the acceleration of the Works or any portion of the Works (which has not been delayed through any fault of the Contractor) in order to achieve completion before the Contract or extended Contract Completion Date, the estimated or extra costs shall be for the Employer's account and shall be based on the Cost or estimated cost incurred by the Contractor plus reasonable profit. Such expediting allowance or, where applicable, the basis for calculation of cost, shall be agreed in writing before any expediting work is commenced. These costs will be included in the Contract in the form of an amendment to the Contract prior to payment, failing which no additional expediting allowance or costs will be for the Employer's account."

#### **Sub-Clause 8.7 – Delay Damages**

In the first paragraph, after the words "... Taking Over Certificate." add a new sentence "If more than one Section is late, the maximum daily penalties for delay that will be applied shall be that for whichever relevant Section has the highest damages value."

#### **Sub-Clause 8.10 – Payment for Plant and Materials in Event of Suspension**

Add at the end of sub-paragraph (b) after "...instructions..." insert "...and if the Contractor has submitted to the Engineer a certificate indicating that ownership is vested in the Contractor signed by the Contractor and the Subcontractor/supplier on whose property the Plant and/or Materials is kept."

Add the following new Sub-Clause after Sub-Clause 8.12:

#### **Sub-Clause 8.13 – Provision for Accelerated Completion**

If the Employer wishes to complete the Works within a revised time being less than the Time or extended Time for Completion prescribed by Sub-Clause 8.2, the Engineer shall direct the Contractor to submit to him within the period specified in the direction:

- (a) the Contractor's priced proposals for achieving the revised time, together with any consequential amendments to the programme; or
- (b) the Contractor's explanation why he is unable to achieve completion within the revised time.

If the Employer accepts the Contractor's proposals in (a) above, as amended or otherwise, an amendment in writing shall be prepared and executed stating:

- (a) the revised Time for Completion;
- (b) the revisions to the programme, including any relevant critical path and any supporting documentation;
- (c) the amount or manner by which the Contract Price shall be adjusted;
- (d) any other relevant amendment to the Contract which has been agreed.



- (e) any agreement shall be concluded between the Contractor and the Employer before the Contractor is required to commence any acceleration to the Works."

## **CLAUSE 10 – EMPLOYER'S TAKING OVER**

### **Sub-Clause 10.1 – Taking Over of the Works and Sections**

For supply-only Contracts, at the end of the last paragraph add a new paragraph as follows:

"Provided that notwithstanding the issue of a Taking-Over Certificate in respect of any Section of the Works pursuant to paragraph (a), the provisions of Sub-Clause 14.9 hereof shall not apply until satisfactory completion of the "Tests on Completion" by the Employer as spelt out in Clause 9.1 above."

The Taking Over Certificate will be issued after all the equipment supplied under this contract has successfully undergone all the required tests at the manufacturers works before being safely delivered and offloaded in the permanent storage on site.

The Tests on Completion will be carried out by the Employer after the installation of all the equipment supplied under this contract has been completed. The Contractor is to satisfy himself that the installation is correct and that all Tests on Completion as defined in Clause 9.1 have been undertaken to prove that the equipment is fit for purpose.

### **Sub-Clause 10.3 – Interference with Tests on Completion**

In the first paragraph, second line after the word "...responsible...", delete the remainder of the sentence and replace with "...the Works shall be regarded as being suspended".

Delete the first sentence of the second paragraph

## **CLAUSE 11 – DEFECTS LIABILITY**

### **Sub-Clause 11.1 – Completion of Outstanding Work and Remedying Defects**

At the start of Sub-Clause 11.1, add the following:

"In these Conditions the expression "Defects Notification Period" shall mean the Defects Notification Period named in the Appendix to Tender, calculated from the Completion Date stipulated in the Taking-Over Certificate issued by the Engineer for the whole of the Works implemented under this Contract in accordance with Sub-Clause 10.1 (the last day of such period being hereinafter called the Expiry Date).

Provided that, in the case of any Section or part of the Works in respect of which a Taking-Over Certificate is issued under Sub-Clause 10.1 or 10.2, as the case may be, the "Defects Notification Period" shall mean the period commencing on the date on which such Taking-Over Certificate is issued under Sub-Clause 10.1 or 10.2, as the case may be, and ending on the Expiry Date."

At the end of Sub-Clause 11.1, add the following:

"If any work is required to remedy defects or damage for which the Contractor is liable (i.e. any amendment, reconstruction, replacements, renewals, remedying or other faults) are such that, in the opinion of the Engineer, it may affect the performance of the Works or any Section or part of the Works, the Engineer may instruct that the Tests on Completion under Clause 9 be repeated to the extent necessary or that such other tests as the Engineer considers necessary be undertaken. The instruction shall be made by notice within 28 days after the amendment, reconstruction, replacements, renewals, remedying defects, or other faults has been completed.

The Contractor shall bear all the costs (which shall include the Employer's costs) and risks related to such repeat or other tests."

### **Sub-Clause 11.6 – Further Tests**

At the end of Sub-Clause 11.6 add the following:

"In the case of any defect in the Plant for which the Contractor is liable which requires repair or replacement of the Plant or any part thereof the Defects Notification Period for such repaired or replaced Plant or part shall commence from the date on which such Plant or part has recommenced operation (and if necessary has passed any repeated Tests on Completion) and shall extend from such date for the period specified in the Appendix to Tender."

## **CLAUSE 13 – VARIATIONS AND ADJUSTMENTS**

### **Sub-Clause 13.1 – "Right to Vary"**

In the second paragraph line 4 after the word "Works" delete the word "or". In line 5 after the word "Guarantees" delete the full stop and add the words "...or (iv) it will impinge on the Contractor's design responsibilities."

### **Sub-Clause 13.3 – Variation Procedure**

In the first paragraph, line two; after the words "as practicable," add the following " or in the time requested by the Engineer, but in any case not later than 42 days after such request,".

### **Sub-Clause 13.7 – Adjustments for Changes in Legislation**

At the end of Sub-Clause 13.7, add the following:

"Provided that for the purpose of this Sub-Clause notices of statutory price increases issued from time to time through the South African Government Gazette shall not constitute a change in Laws and all such price increases shall be deemed included in the provisions of Sub-Clause 13.8. Such statutory price increases shall include, but not be limited to, fuel price increases, minimum wages, licensing fees, border clearance fees, customs and other duties, contributions to Workman's Compensation and the Unemployment Insurance Fund, and the like".

### **Sub-Clause 13.8 – Adjustments for Changes in Cost**

Delete the text of this Sub-Clause and substitute:

"Except as hereinafter provided for in this Sub-Clause and subject to Clause 12.3, the rates and prices in the Contract shall be final and binding throughout the Contract.

Where in this Sub-Clause 13.8 reference is made to the indices published by Statistics South Africa or by THE STEEL AND ENGINEERING INDUSTRIES FEDERATION OF SOUTH AFRICA (SEIFSA), such indices shall be final and binding on the Parties unless one of the Parties queries any such index to the Engineer within 28 days of its final publication. The Engineer shall employ its best endeavours to obtain clarification, ratification or modification to such index from Statistics South Africa or SEIFSA, whereupon the index shall become final and binding on the Parties. If no such clarification, ratification or modification is received within 90 days of the query to the Engineer then the last published index shall be final and binding on the Parties.

As sole compensation for any increases or decreases in any charges elemental to the rates and prices in the Contract, which increases or decreases may arise subsequent to tendering from whatsoever cause, adjustment of the Contract Price shall be calculated for each monthly statement pursuant to Sub-Clause 14.3, the Statement at Completion pursuant to Sub-Clause 14.10 and the Final Statement pursuant to Sub-Clause 14.11 in accordance with the provisions of this Sub-Clause as detailed below:

#### **a) Steel Pipes, valves, pipe specials and fittings**

- (i) The value apportioned to Steel Pipes in the certificate issued in terms of Clause 14.3 hereof, shall be increased or decreased by the amount obtained by multiplying "Ac" defined in (ix) below by the Contract Price Adjustment factor ( $f_1$ ) determined according to the formulae:



for supply and delivery items:  $f_i = (1 - x)(a \frac{L1_t}{L1_o} + b \frac{M_t}{M_o} - 1)$

for installation, testing, commissioning and general items:  $f_i = (1 - x)(\frac{L2_t}{L2_o} - 1)$

in which the symbols have the following meaning:

- (ii) "x" shall be the proportion of "Ac" which is not subject to adjustment. This proportion shall be 0,15.
- (iii) "a" and "b" shall be the coefficients nominated by the Contractor or, if he has chosen not to so nominate then those listed by the Engineer in the same Tender Schedule, which are deemed, irrespective of the actual constituents of the work, to represent the proportionate value of respectively, labour and materials. The arithmetical sum of "a" and "b" shall in all cases be unity.
- (iv) "L1" shall be the Labour Index and shall be the "SEIFSA Index of Actual Labour Cost" as published by SEIFSA in Table C-3.
- (v) "L2" shall be the Labour Index and shall be the "SEIFSA Index of Actual Labour Cost (Field Force)" as published by SEIFSA in Table C-3(a).
- (vi) "M" shall be the materials index and shall be the index for "Steel Tube, Pipe and Fittings Production Price Index" as published by Statistics South Africa in Statistical News Release PO142.1 as published by SEIFSA in Table I.
- (vii) The suffix "o" denotes the base indices applicable to the base month which shall be the month prior to the month in which the closing date for the tender falls.
- (viii) The suffix "t" denotes the current indices applicable to the month in which the last day of the period to which the relevant payment certificate relates falls, which shall not be earlier than the twentieth day of the month unless otherwise agreed by the Engineer in writing.
- (ix) For the purpose of calculating the adjustment to the value of the relevant certificates, the amount "Ac" shall be determined by the formula:

$Ac = T - S - D - E - Ap$  in which the symbols have the following meanings:

- (x) "T" shall be the total value of the portion of the certificate under consideration excluding any advance payments before the deduction of any retention monies, liquidated damages, or repayment of advances and before any adjustments made in terms of this Sub-Clause 13.8.
- (xi) "S" shall be the aggregate of (a), (b) and (c) referred to below and included in "T"
  - (a) the value of any work done by Nominated Subcontractor/s and not subject to the Contractor price adjustment provision of the principal Contractor;
  - (b) the value of any extra or additional work;
  - (c) the value of any work done against Provisional Sums;

where special arrangements for price adjustments in respect of those amounts were made and recorded at the time the work was ordered.

- (xii) "D" shall be the value of work included in "T" done at new rates or prices fixed in terms of Sub-Clause 12.3 where those rates or prices are not based on labour, Contractor's Equipment or material costs in force at the time of tendering. When new rates or prices are based on tendered rates or prices applicable at the base month of the indices, the value of work done at such new rates

or prices shall not be included in the value of "D".

- (xiii) "E" shall be the amount included in "T" paid for any day work executed at current rates plus percentage allowances as set out in Sub-Clause 13.6, where those rates are not based on labour Contractor's Equipment or material costs in force at the time of tendering and indicated in the Day Work Schedule which is included in Section 8 hereof. Generally when Day Work rates are based on tendered rates or on current costs de-escalated to the base month of the indices, the value of work done at these rates shall not be included in the value of "E".
- (xiv) "Ap" shall be the sum of "Ac" amounts determined in terms of this Sub-Clause for all certificates issued in accordance with Clause 14 preceding in time the certificate under consideration.
- (xv) Save only for additional work or variations ordered to be carried out after the Time for Completion, (as extended, if applicable under Clause 8.4) the Contract Price Adjustment Factor to be applied to certificates relating to work done or materials supplied after the Time for Completion, shall be half (50% of) the factors calculated by inserting in the formulae referred to in (i) above, indices applicable at the Time for Completion.
- (xvi) If any index relevant to any particular certificate is not known at the time the certificate is valued the latest available index shall be used and an adjustment made when the index relevant to that particular certificate is published."

**b) Mechanical and Electrical Works**

- (i) The value of each Mechanical and Electrical portion of the certificate issued in terms of Clause 14.3 hereof, shall be increased or decreased by the amount obtained by multiplying "Ac" defined in (ix) below by the Contract Price Adjustment factor ( $f_1$ ) determined according to the formulas:

for supply and delivery items: 
$$f_1 = (1 - x) \left( a \frac{L1_t}{L1_o} + b \frac{M_t}{M_o} - 1 \right)$$

for installation, testing, commissioning and general items: 
$$f_1 = (1 - x) \left( \frac{L2_t}{L2_o} - 1 \right)$$

in which the symbols have the following meaning:

- (ii) "x" shall be the proportion of "Ac" which is not subject to adjustment. This proportion shall be 0,10.
- (iii) "a" and "b" shall be the coefficients nominated by the Contractor in or, if he has chosen not to so nominate then those listed by the Engineer in the same Tender Schedule, which are deemed, irrespective of the actual constituents of the work, to represent the proportionate value of respectively, labour and materials. The arithmetical sum of "a" and "b" shall in all cases be unity.
- (iv) "L1" shall be the Labour Index and shall be the "SEIFSA Index of Actual Labour Cost" as published by SEIFSA in Table C-3.
- (v) "L2" shall be the Labour Index and shall be the "SEIFSA Index of Actual Labour Cost (Field Force)" as published by SEIFSA in Table C-3(a).
- (vi) "M" shall be the materials index and shall be the index for "Mechanical or Electrical Engineering Materials Production Price Index" as published by Statistics South Africa in Statistical News Release PO142.1 as published by SEIFSA in Table G. For 3CR12 items the materials index shall be Table Q1(A) Corrosion Resistant Steel 3CR12.



- (vii) The suffix "o" denotes the base indices applicable to the base month which shall be the month prior to the month in which the closing date for the tender falls.
- (viii) The suffix "t" denotes the current indices applicable to the month in which the last day of the period to which the relevant payment certificate relates falls, which shall not be earlier than the twentieth day of the month unless otherwise agreed by the Engineer in writing.
- (ix) For the purpose of calculating the adjustment to the value of the relevant certificates, the amount "Ac" shall be determined by the formula:

$Ac = T - S - D - E - Ap$  in which the symbols have the following meanings:

- (x) "T" shall be the total value of the portion of the certificate under consideration excluding any advance payments before the deduction of any retention monies, liquidated damages, or repayment of advances and before any adjustments made in terms of this Sub-Clause 13.8.
- (xi) "S" shall be the aggregate of (a), (b) and (c) referred to below and included in "T"
  - (a) the value of any work done by Nominated Subcontractor/s and not subject to the Contractor price adjustment provision of the principal Contractor;
  - (b) the value of any extra or additional work;
  - (c) the value of any work done against Provisional Sums;

where special arrangements for price adjustments in respect of those amounts were made and recorded at the time the work was ordered.

- (xii) "D" shall be the value of work included in "T" done at new rates or prices fixed in terms of Sub-Clause 12.3 where those rates or prices are not based on labour, Contractor's Equipment or material costs in force at the time of tendering. When new rates or prices are based on tendered rates or prices applicable at the base month of the indices, the value of work done at such new rates or prices shall not be included in the value of "D".
- (xiii) "E" shall be the amount included in "T" paid for any day work executed at current rates plus percentage allowances as set out in Sub-Clause 13.6, where those rates are not based on labour Contractor's Equipment or material costs in force at the time of tendering and indicated in the Schedule. Generally when Day Work rates are based on tendered rates or on current costs de-escalated to the base month of the indices, the value of work done at these rates shall not be included in the value of "E".
- (xiv) "Ap" shall be the sum of "Ac" amounts determined in terms of this Sub-Clause for all certificates issued in accordance with Clause 14 preceding in time the certificate under consideration.
- (xv) Save only for additional work or variations ordered to be carried out after the Time for Completion, (as extended, if applicable under Clause 8.4 the Contract Price Adjustment Factor to be applied to certificates relating to work done or materials supplied after the Time for Completion, shall be half (50% of) the factors calculated by inserting in the formulae referred to in (i) above, indices applicable at the Time for Completion.
- (xvi) If any index relevant to any particular certificate is not known at the time the certificate is valued the latest available index shall be used and an adjustment made when the index relevant to that particular certificate is published."

## **CLAUSE 14 – CONTRACT PRICE AND PAYMENT**

### **Sub-Clause 14.2 – Advance Payment**

Delete Clause 14.2 in its entirety.

#### **Sub-Clause 14.3 – Application for Interim Payment Certificates**

Add the end of the first paragraph after Sub-Clause 4.21 [Progress Reports] add the following:-

, including: -

- (a) Mechanical Inspection clearance
- (b) Corrosion Protection clearance
- (c) Completed delivery certificates – Form ME2
- (d) Examination and test certificates
- (e) "As made" drawings
- (f) Operating and Maintenance instruction manuals

#### **Sub-Clause 14.5 – Plant and Materials intended for the Works**

Delete the first paragraph and replace with the following:-

If this Sub-Clause applies, Interim Payment Certificates shall include under sub-paragraph (e) of sub-clause 14.3, (i) an amount for manufacture and materials purchased up to 70 % of the total amount ordered for the equipment but still at the manufacturing works and not having been delivered to site, and not in the possession of the Employer, (ii) an amount for plant and materials which have been sent to site for incorporation into the Permanent Works, and (iii) a reduction when such Plant and Materials is included as part of the Permanent Works under sub-paragraph a) of Sub-Clause 14.3 [Applicable for Interim Payment Certificates].

After c) add d) as follows:-

d) the relevant manufacture and materials purchased by the Contractor, but not having been delivered to site nor in possession of the Employer:-

- (i) the Contractor shall provide security in a form acceptable to the Employer equal to the total amount of payments to be made to the Contractor.
- (ii) The total amount of such security, provided by the Contractor to the Employer, may be varied by the Contractor, with the consent of the Employer from time to time provided that the Employer will be covered at all times to the total amount paid by the Employer to the Contractor for items not yet in possession of the Employer.
- (iii) The Employer shall have the right to recoup any money due to him by the Contractor for any clause whatsoever, irrespective of whether, such claim is liquidated or not, before making any payment to the Contractor under this clause and no money shall accrue to or become due and payable to the Contractor in terms of this Contract until such other claims have been paid in full.
- (iv) no sum paid on account by the Employer shall affect or prejudice his rights against the Contractor or relieve the Contractor of any of his obligations for the due fulfilment of the Contract and the acceptance by the Contractor of any such sum shall not affect or prejudice the rights of the Contractor against the Employer,

#### **Sub-Clause 14.6 – Issue of Interim Payment Certificates**

Replace "28 days" with "14 days" in the second line of the first paragraph.

#### **Sub-Clause 14.7 – Payment**

Delete sub paragraphs a), b) and c) of the first paragraph and replace with "according to the agreed schedule of progress payments referred to in Clause 14.4".

#### **Sub-Clause 14.8 – Delayed Payment**

Delete the text of the second paragraph and insert the following:

"These financing charges shall be calculated at the annual rate of 1% above the prime overdraft rate

charged by the Standard Bank of South Africa Limited in Pretoria on the due date."

#### **Sub-Clause 14.15 – Currencies of Payment**

Replace this Sub-Clause with the following:

"The currency of account shall be the South African Rand and all payments made in accordance with the Contract shall be South African Rand."

#### **Sub-Clause 14.16 – Unfulfilled Obligations**

Notwithstanding the issue of the Final Certificate, the Contractor and subject to sub-clause 14.15, the Employer shall remain liable for the fulfilment of any obligation incurred under the provisions of the Contract prior to the issue of the Final Certificate which remain unperformed at the time such certificate is issued, and for the purpose of determining the nature and extent of any such obligation the Contract shall be deemed to remain in force between the parties hereto.

### **CLAUSE 16 – SUSPENSION AND TERMINATION BY CONTRACTOR**

#### **Sub-Clause 16.1 – Contractor's Entitlement to Suspend Work**

In line one, after the word "If" insert ", without the prior agreement of the Contractor,".

In the first paragraph, line six; "or" should read "of".

At the start of the second paragraph insert after "The" the words "prior agreement or the".

### **CLAUSE 19 – FORCE MAJEURE**

#### **Sub-Clause 19.2 – Notice of Force Majeure**

First paragraph, line four, delete the words "...within 14 days..." and replace with "...within 7 days...".

#### **Sub-Clause 19.6 – Optional Termination, Payment and Release**

In (c) add the following new sentence at the end of the existing sentence  
"Costs associated with preparation of Tenders or scope of work or any costs incurred prior to Contract award is for each party's own account and will not form part of cancellation costs"

### **CLAUSE 20 – CLAIMS, DISPUTES AND ARBITRATION**

#### **Sub-Clause 20.1 – Contractor's Claims**

Fifth paragraph, line six, insert after "If..." the text "...it is agreed by the Engineer that...".

#### **Sub-Clause 20.4 – Obtaining Dispute Adjudication Board's Decision**

Add the following paragraph after the first paragraph:

"Provided that the DAB will not be empowered to address any matter unless the Party referring a dispute to the DAB provides, at the minimum, copies of the following full documents:

- a) the written opinion, instruction, determination, certificate or valuation of the Engineer;
- b) the Party's written objection to such opinion, instruction, determination, certificate or valuation of the Engineer;
- c) the Engineer's written response to such objection, and
- d) a written definition by the Party of the resulting dispute.

The DAB will then confirm in writing to both Parties and the Engineer its acceptance of the referral and the validity of the dispute."



**Sub-Clause 20.6 – Arbitration**

First paragraph, line two, delete "international".

Sub-paragraph (a), delete "Arbitration of the International Chamber of Commerce" and insert "the Association of Arbitrators (Southern Africa)".

Add the following sub-paragraph:

"(d) The place of Arbitration shall be Johannesburg, Republic of South Africa."



**OLIFANTS RIVER WRDP  
DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

**SECTION 4:  
ADMINISTRATIVE FORMS TO BE  
COMPLETED BY TENDERER**

## LIST OF FORMS TO BE COMPLETED BY ALL TENDERERS

### ***A. FORMS TO BE COMPLETED PRIOR TO SUBMITTING THE TENDER***

FORM DESCRIPTION	FORM DESIGNATION
1. INVITATION TO BID	SBD 1
2. TAX CLEARANCE CERTIFICATE REQUIREMENTS	SBD 2 & TCC 001
3. AUTHORITY FOR SIGNATORY	
4. PRICING SCHEDULE (SEE SECTION 8: BILL OF QUANTITIES AND PRICING)	SBD 3.1
5. DECLARATION OF INTEREST	SBD 4
6. PREFERENTIAL PROCUREMENT REGULATIONS: PURCHASES	SBD 6.1
7. FORM OF TENDER	
8. APPENDIX TO FORM OF TENDER	
9. APPENDIX TO TENDER	
10. DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES	SBD 8
11. CERTIFICATE OF INDEPENDENT BID DETERMINATION	SBD 9
12. PROPOSED ALTERATIONS TO SPECIFICATION	ANNEXURE A
13. SCHEDULE OF SIMILAR WORK UNDERTAKEN BY TENDERER	ANNEXURE B
14. SCHEDULE OF PROPOSED SUBCONTRACTORS	ANNEXURE C
15. SCHEDULE OF IMPORTING CHARGES	ANNEXURE D
16. QUALITY SYSTEM QUESTIONNAIRE	ANNEXURE F
17. SCHEDULE OF QUALIFICATIONS / EXPERIENCE OF INSPECTORS	ANNEXURE G

### ***B. FORMS TO BE COMPLETED WHEN REQUESTED AFTER AWARDING OF THE TENDER***

FORM DESCRIPTION	FORM DESIGNATION
1. VENDOR MASTER MAINTENANCE	SAP Version 2
2. FORM OF AGREEMENT (ERECTION)	
3. PERFORMANCE BOND FOR CONTRACT	
4. FORM OF MANUFACTURE PAYMENT BOND	
5. DELIVERY CERTIFICATE	ME 2
6. CERTIFICATE OF COMMISSIONING	

## PART A INVITATION TO BID

<b>YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE DEPARTMENT OF WATER AND SANITATION</b>					
BID NUMBER:	DWS 04-0419 WTE	CLOSING DATE:	6 June 2019	CLOSING TIME:	11:00
DESCRIPTION	THE MANUFACTURE, SUPPLY, DELIVERY TO SITE, INSTALLATION AND COMMISSIONING OF ONE PASSENGER LIFT, GUIDE RAILS, OPERATING SYSTEM AND MAINTENANCE CONTRACT FOR OLIFANTS RIVER RESOURCES DEVELOPMENT PROJECT AT DE HOOP DAM.				
<b>BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)</b>					
157 FRANCIS BAARD STREET					
ZWAMADAKA BUILDING					
PRETORIA					
0001					
<b>BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO</b>			<b>TECHNICAL ENQUIRIES MAY BE DIRECTED TO:</b>		
CONTACT PERSON	BID OFFICE		CONTACT PERSON	J.S POTGIETER	
TELEPHONE NUMBER	012 336 7596/7066/7780/6562/6544		TELEPHONE NUMBER	012 336 8342	
FACSIMILE NUMBER			FACSIMILE NUMBER		
E-MAIL ADDRESS	bidenquirieswte@dws.gov.za		E-MAIL ADDRESS	potgieterj@dwa.gov.za	
<b>SUPPLIER INFORMATION</b>					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE No:	MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX]  <input type="checkbox"/> Yes <input type="checkbox"/> No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX]  <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES &amp; QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]</b>					
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?		<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER PART B:3 ]
<b>QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS</b>					
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
DOES THE ENTITY HAVE A BRANCH IN THE RSA?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.					

## PART B TERMS AND CONDITIONS FOR BIDDING

<b>1. BID SUBMISSION:</b>
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2. <b>ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED--(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.</b>
1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
1.4. <b>THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).</b>
<b>2. TAX COMPLIANCE REQUIREMENTS</b>
2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.6 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

**NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.**

SIGNATURE OF BIDDER: .....

CAPACITY UNDER WHICH THIS BID IS SIGNED: .....  
(Proof of authority must be submitted e.g. company resolution)

DATE: .....

**B. AUTHORITY FOR SIGNATORY**      *(Example)*

Signatories for Companies, Partnerships or Close Corporations must establish their authority thereto by attaching a copy of the relevant resolution of their Board of Directors, Members or Partners duly signed and dated. An example is shown below for a Company:

"By resolution of the Board of Directors at a meeting on ..... 20..... at.....

Mr/Ms .....  
.....

whose signature appears below, has been duly authorised to sign all documents in connection with this

Tender for Contract No ....., and any contract which may arise there from, on behalf of  
(company, block capitals) .....

SIGNATURE OF RESPONSIBLE PERSON OF COMPANY: .....

IN HIS CAPACITY AS: .....

DATE: .....

SIGNATURE OF SIGNATORY AUTHORISED TO  
SIGN ON BEHALF OF COMPANY: .....

WITNESSES: .....

*(NOTE: This is a typical example of an authority for signature. Signatures of both Responsible Person and authorised Signatory are required on the certificate provided by the Tenderer )*

**PRICING SCHEDULE – FIRM PRICES**  
**(Purchases)**

**SBD 3.1**

**NOTE: ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED.**

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT.

CLOSING TIME 11:00 ON: .....	BID NO.: W.....
NAME OF BIDDER: .....	

**OFFER TO BE VALID FOR 90 DAYS FROM CLOSING DATE OF BID**

ITEM NO	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)
As per Bill of Quantities	As per Bill of Quantities	As per Bill of Quantities	As per Bill of Quantities
		15 % VAT	
		<b>TOTAL BID PRICE</b>	<b>R</b>

- Required by: Directorate Construction for OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT
- At (Place of delivery): DE HOOP DAM
- Brand and model: .....
- Country of origin: .....
- Period required for delivery after receipt of order: .....
- Delivery period: FIRM / NOT FIRM
- Does the item offered comply with any recognise Standards body, e.g. SABS? \* YES / NO
- If so furnish valid certificate to this end ATTACHED / NOT ATTACHED
- Is offer strictly to specification? \* YES / NO
- If not to specification, state deviation(s) .....
- Delivery basis. See note hereunder .....

**NOTE:** All delivery costs must be included in the bid price, for delivery at the prescribed destination.

\* Delete whichever is not applicable.

\*\* "all applicable taxes" includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.



# water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

## ANNEXURE B

### SBD 4

### DECLARATION OF INTEREST

1. Any legal person, including persons employed by the state<sup>1</sup>, or persons having a kinship with persons employed by the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid (includes an advertised competitive bid, a limited bid, a proposal or written price quotation). In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons employed by the state, or to persons connected with or related to them, it is required that the bidder or his/her authorised representative declare his/her position in relation to the evaluating/adjudicating authority where-
  - the bidder is employed by the state; and/or
  - the legal person on whose behalf the bidding document is signed, has a relationship with persons/a person who are/is involved in the evaluation and or adjudication of the bid(s), or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and or adjudication of the bid.
2. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**
  - 2.1 Full Name of bidder or his or her representative: .....
  - 2.2 Identity Number:.....
  - 2.3 Position occupied in the Company (director, trustee, shareholder<sup>2</sup>, member):  
.....
  - 2.4 Registration number of company, enterprise, close corporation, partnership agreement or trust:  
.....
  - 2.5 Tax Reference Number: .....
  - 2.6 VAT Registration Number: .....
  - 2.6.1 The names of all directors / trustees / shareholders / members, their individual identity numbers, tax reference numbers and, if applicable, employee / PERSAL numbers must be indicated in paragraph 3 below.

<sup>1</sup>"State" means –

- (a) any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
- (b) any municipality or municipal entity;
- (c) provincial legislature;
- (d) national Assembly or the national Council of provinces; or



(e) Parliament.

"Shareholder" means a person who owns shares in the company and is actively involved in the management of the enterprise or business and exercises control over the enterprise.

2.7 Are you or any person connected with the bidder presently employed by the state? YES / NO

2.7.1 If so, furnish the following particulars:

Name of person / director / trustee / shareholder/ member: .....  
Name of state institution at which you or the person connected to the bidder is employed : .....  
Position occupied in the state institution: .....

Any other particulars:  
.....  
.....  
.....

2.7.2 If you are presently employed by the state, did you obtain the appropriate authority to undertake remunerative work outside employment in the public sector? YES / NO

2.7.2.1 If yes, did you attach proof of such authority to the bid document? YES / NO

(Note: Failure to submit proof of such authority, where applicable, may result in the disqualification of the bid.

2.7.2.2 If no, furnish reasons for non-submission of such proof:

.....  
.....  
.....

2.8 Did you or your spouse, or any of the company's directors / trustees / shareholders / members or their spouses conduct business with the state in the previous twelve months? YES / NO

2.8.1 If so, furnish particulars:

.....  
.....  
.....

2.9 Do you, or any person connected with the bidder, have any relationship (family, friend, other) with a person employed by the state and who may be involved with the evaluation and or adjudication of this bid? YES / NO

.....

.....

.....

.....

**YES/NO**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**YES/NO**

.....

.....

.....

### 3 Full details of directors / trustees / members / shareholders.

[illegible]

**4 DECLARATION**

I, THE UNDERSIGNED (NAME).....

CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 2 and 3 ABOVE IS CORRECT.  
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME SHOULD THIS  
DECLARATION PROVE TO BE FALSE.

.....  
Signature

.....  
Date

.....  
Position

.....  
Name of bidder

November 2011



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

SBD 6.1

### PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

**NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.**

#### 1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable; or

1.3 Points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	80
B-BBEE STATUS LEVEL OF CONTRIBUTOR	20
Total points for Price and B-BBEE must not exceed	100

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser 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 the purchaser.

## 2. DEFINITIONS

- (a) **“B-BBEE”** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (b) **“B-BBEE status level of contributor”** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (c) **“bid”** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;
- (d) **“Broad-Based Black Economic Empowerment Act”** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (e) **“EME”** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (f) **“functionality”** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.
- (g) **“prices”** includes all applicable taxes less all unconditional discounts;
- (h) **“proof of B-BBEE status level of contributor”** means:
  - 1) B-BBEE Status level certificate issued by an authorized body or person;
  - 2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;
  - 3) Any other requirement prescribed in terms of the B-BBEE Act;
- (i) **“QSE”** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (j) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

## 3. POINTS AWARDED FOR PRICE

### 3.1 THE 80/20 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

**80/20**

$$P_s = 80 \left( 1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

- $P_s$  = Points scored for price of bid under consideration
- $P_t$  = Price of bid under consideration
- $P_{\min}$  = Price of lowest acceptable bid

#### 4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

- 4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must 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 (80/20 system)
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

#### 5. BID DECLARATION

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

#### 6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

- 6.1 B-BBEE Status Level of Contributor:      = .....(maximum of 20 points)  
(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.)

#### 7. SUB-CONTRACTING

- 7.1 Will any portion of the contract be sub-contracted?

(Tick applicable box)

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

- 7.1.1 If yes, indicate:

- What percentage of the contract will be subcontracted.....%
- The name of the sub-contractor.....
- The B-BBEE status level of the sub-contractor.....
- Whether the sub-contractor is an EME or QSE

(Tick applicable box)

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

- v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations, 2017:

<b>Designated Group: An EME or QSE which is at least 51% owned by:</b>	<b>EME</b> √	<b>QSE</b> √
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
<b>OR</b>		
Any EME		
Any QSE		

**8. DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:.....

8.2 VAT registration number:.....

8.3 Company registration number:.....

**8.4 TYPE OF COMPANY/ FIRM**

Partnership/Joint Venture / Consortium

One person business/sole propriety

Close corporation

Company

(Pty) Limited

[TICK APPLICABLE BOX]

**8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES**

.....  
 .....  
 .....  
 .....  
 .....

**8.6 COMPANY CLASSIFICATION**

Manufacturer

Supplier

Professional service provider

Other service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

8.7 Total number of years the company/firm has been in business:.....

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of



contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser 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) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audialterampartem* (hear the other side) rule has been applied; and
  - (e) forward the matter for criminal prosecution.

**WITNESSES**

- 1. ....
- 2. ....

.....  
SIGNATURE(S) OF BIDDERS(S)

DATE: .....

ADDRESS .....

.....

.....

**REPUBLIC OF SOUTH AFRICA**  
**DEPARTMENT OF WATER AND SANITATION**

TENDER DWS 04-0419 WTE

FORM OF TENDER

WORKS: \_\_\_\_\_

To: Director-general

Tenderer: \_\_\_\_\_

Department of Water And Sanitation

Address: \_\_\_\_\_

Private Bag X313

PRETORIA

0001

Telegraphic address: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Sir

1. Having examined the Drawings, Conditions of Contract, Specifications, Schedules, Annexures and Appendices thereto, for the execution of the abovenamed Works, we, the undersigned, offer to design, manufacture, paint, deliver, off-load, the whole of the said Works in conformity with the said Drawings, Conditions of Contract, Specifications, Schedules, Annexures and Appendices for the sum of \_\_\_\_\_ South African Rand (R \_\_\_\_\_) inclusive of Value Added Tax, (currently amounting to ...%), or such other sum as may be ascertained in accordance with the said Conditions of Contract.
2. We acknowledge that all parts of the Drawings, Conditions of Contract, Specifications, Schedules, Annexures and Appendices to this Tender form part of our Tender.
3. We undertake to -
  - (a) submit drawings and manuals as specified; and
  - (b) design, manufacture, deliver, off-load, install, commission, test and complete the Works not later than the dates stated in the Appendix to Form of Tender.
4. If our Tender is accepted, we will obtain the guarantee of an Insurance or Registered company or Bank (to be approved by you) to be jointly and severally bound with us in the sum of R \_\_\_\_\_ being 10% of the sum named in paragraph 1, above, for the due performance of the Contract under the terms of a Performance Bond in the form appended hereto with such modifications as you may approve.
5. We agree to abide by this Tender for the period of 90 days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. Unless and until a formal Agreement is prepared and executed, this Tender, together with your written acceptance thereof, shall constitute a binding Contract between us, and shall be deemed for all purposes to be the Contract Agreement.
7. We understand that you are not bound to accept the lowest, or any tender you may receive and that you will not defray any expenses incurred by us in tendering.
8. We undertake, if our Tender is accepted, to establish a Registered Office in the Republic of South Africa which will be our domicilium citandi et executandi in South Africa and to notify you of this address.
9. We have duly attached to this Tender the documents called for in the Instructions to Tenderers and have completed all the forms, affidavits, schedules and appendices where applicable.

DATED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ AT \_\_\_\_\_

WITNESS

1. \_\_\_\_\_

TENDERER'S SIGNATURE: \_\_\_\_\_

2. \_\_\_\_\_

in the capacity of \_\_\_\_\_  
duly authorised to sign tenders for and on behalf of

(IN BLOCK CAPITALS)

**TENDERERS SHALL COMPLETE THIS FORM FOR EACH OF THE ITEMS OFFERED AND ATTACH IT TO THEIR OFFERS.**

### PROGRAMME

The Tenderer is required to enter below a firm programme of which he is capable calculated in WEEKS FROM THE DATE OF RECEIPT OF THE LETTER OF ACCEPTANCE. (Refer to Particular Specification.)

Item	Guaranteed programme (weeks after Order)	
	Required	Offered
Provision of drawings and information necessary for civil construction	n.a.	
Provision of programme and schedules for manufacture, works tests, delivery to Site, erection, commissioning and performance testing	4	
Completion of delivery of materials to Manufacturer's Works		
Completion of manufacture of all plant/equipment	As per specified delivery dates where applicable	
Completion of Workshop Testing	As per specified delivery dates where applicable	
Delivery to Site	As per specified delivery dates where applicable	

### AFFIRMATION

- Amendment No's. \_\_\_\_\_ have been received and our Tender incorporates their requirements, modifications and amendments.
- We further state that
  - our price is firm/not firm
  - our delivery period for equipment is firm/not firm
  - an import permit is required/not required
  - our offer is fully to Specification/is not to Specification as stated in Annexure A and/or our covering letter.

NAME AND ADDRESS OF OVERSEAS PRINCIPALS: (if applicable)

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---

NAME OF TENDERER: \_\_\_\_\_

SIGNATURE OF TENDERER: \_\_\_\_\_

DATE: \_\_\_\_\_

## APPENDIX TO TENDER

### SUPPLY AND INSTALLATION OF GENERAL MECHANICAL AND ELECTRICAL WORKS

(Note: With the exception of the items for which the Employer's requirements have been inserted, the following information must be completed before the Tender is submitted.)

ITEM	SUB-CLAUSE	ENTRY
Employer's name and address	1.1.2.2 & 1.3	DEPT. of WATER AND SANITATION PRIVATE BAG X 313 PRETORIA 0001
Contractor's name and address	1.1.2.3 & 1.3	<hr/> <hr/> <hr/> <hr/>
Engineer's name and address	1.1.2.4 & 1.3	MR J.S. POTGIETER DEPT. of WATER AND SANITATION
Time for completion of the works	1.1.3.3	See Tender document
Defects Notification Period	1.1.3.7	365 days
Electronic transmission systems	1.3	Facsimile transmissions only
Governing law	1.4	Republic of South Africa
Ruling language	1.4	English
Language for communications	1.4	English
Time for access to the Site	2.1	____ days after Commencement Date
Amount of Performance Security	4.2	Normally 10 % of the Accepted Contract Amount, in the currencies and proportions in which the contract price is payable.
Period for notifying unforeseeable errors, faults and defects in the Employer's Requirements	5.1	30 days
Delay damages for the works	8.7 & 14.15(b)	0,5 % of the Final Contract Price per week, in the currencies and proportions in which the Contract Price is payable.

---

Initials of signatory of Tender \_\_\_\_\_



## APPENDIX TO TENDER (Continued)

Adjustments for Changes in Cost; Table(s) of adjustment data	13.8	n.a. (Firm price)
Percentage of retention	14.3	10 % on all payments
Minimum amount of Interim Payment Certificates	14.6	_____% of the Accepted Contract Amount
Currency \.currencies of payment	14.15	South African Rand
The DAB shall be	20.2	a DAB of three members
Appointment (if not agreed) to be made by	20.3	The President of FIDIC or a person appointed by the President.

---

Initials of signatory of Tender \_\_\_\_\_



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

SBD 8

### DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1 This Standard Bidding Document must form part of all bids invited.
- 2 It serves as a declaration to be used by institutions in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3 The bid of any bidder may be disregarded if that bidder, or any of its directors have-
  - a. abused the institution's supply chain management system;
  - b. committed fraud or any other improper conduct in relation to such system; or
  - c. failed to perform on any previous contract.
- 4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? <b>(Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied).</b>  The Database of Restricted Suppliers now resides on the National Treasury's website ( <a href="http://www.treasury.gov.za">www.treasury.gov.za</a> ) and can be accessed by clicking on its link at the bottom of the home page.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? <b>The Register for Tender Defaulters can be accessed on the National Treasury's website (<a href="http://www.treasury.gov.za">www.treasury.gov.za</a>) by clicking on its link at the bottom of the home page.</b>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

4.3.1	If so, furnish particulars:		
4.4	Was any contract between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.4.1	If so, furnish particulars:		

**SBD 8**

### **CERTIFICATION**

**I, THE UNDERSIGNED (FULL NAME).....  
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION  
FORM IS TRUE AND CORRECT.**

**I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT,  
ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION  
PROVE TO BE FALSE.**

.....  
**Signature**

.....  
**Date**

.....  
**Position**

.....  
**Name of Bidder**

Js365bW



## **water & sanitation**

Department:  
Water and Sanitation  
**REPUBLIC OF SOUTH AFRICA**

**SBD 9**

### **CERTIFICATE OF INDEPENDENT BID DETERMINATION**

- 1 This Standard Bidding Document (SBD) must form part of all bids<sup>1</sup> invited.
- 2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).<sup>2</sup> Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
- 3 Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:
  - a. disregard the bid of any bidder if that bidder, or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct in relation to such system.
  - b. cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the bidding process or the execution of that contract.
- 4 This SBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
- 5 In order to give effect to the above, the attached Certificate of Bid Determination (SBD 9) must be completed and submitted with the bid:

<sup>1</sup> Includes price quotations, advertised competitive bids, limited bids and proposals.

<sup>2</sup> Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.



## **CERTIFICATE OF INDEPENDENT BID DETERMINATION**

I, the undersigned, in submitting the accompanying bid:

---

(Bid Number and Description)

in response to the invitation for the bid made by:

---

(Name of Institution)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of: \_\_\_\_\_ that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
  - (a) has been requested to submit a bid in response to this bid invitation;
  - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
  - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium<sup>3</sup> will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
- (a) prices;
  - (b) geographical area where product or service will be rendered (market allocation)
  - (c) methods, factors or formulas used to calculate prices;
  - (d) the intention or decision to submit or not to submit, a bid;
  - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
  - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

.....  
Signature

.....  
Date

.....  
Position

.....  
Name of Bidder

Js914w 2



## ANNEXURE B

TENDER W \_\_\_\_\_

### SCHEDULE OF SIMILAR WORK UNDERTAKEN BY TENDERER

The Tenderer shall, in the schedule hereunder, list all work of a similar nature to that contained in this Contract which has been carried out by him during the past five years and/or which is at present being carried out by him.

[illegible]

NOTE: IF NO SIMILAR WORK HAS BEEN CARRIED OUT, THE ABOVE SCHEDULE IS TO BE MARKED "NIL" BY THE TENDERER

NAME OF TENDERER: \_\_\_\_\_

SIGNATURE OF TENDERER: \_\_\_\_\_

DATE: \_\_\_\_\_





## ANNEXURE D

## TENDER W \_\_\_\_\_

### SCHEDULE OF IMPORTING CHARGES

The Contract Price is based on the cost of labour and materials, sea or air freight and marine insurance, customs tariffs and dumping duties (if any), importing charges, railage rates and rates of exchange between South Africa and relevant foreign currencies ruling at the date of tender and the Contract Price shall be amended to provide for variations by either rise or fall occurring in these costs in accordance with the General Conditions of Contract.

The Contract Price is based on the following rates which were ruling at the date of fixing the rate of exchange:

[illegible]

DATE OF FIXING RATE OF EXCHANGE: \_\_\_\_\_

NAME OF TENDERER: \_\_\_\_\_

SIGNATURE OF TENDERER: \_\_\_\_\_

DATE: \_\_\_\_\_

**ANNEXURE D (CONT)**

**TENDER W** \_\_\_\_\_

**SCHEDULE OF IMPORTING CHARGES (CONT.)**

Based on the Main Offer the total amount of foreign currency subject to variation in the rate of exchange as set out above is as follows:

- Value of materials and plant to be imported on existing quotas and allocations R \_\_\_\_\_
- Value of additional import permit required (if any) R \_\_\_\_\_
- Total f.o.b. Port of shipment value R \_\_\_\_\_
- Total value of freight and insurance included in tendered price that is subject to exchange adjustment R \_\_\_\_\_

**NOTES:**

The Contractor's commitment in Foreign Currency included in the Contract Price has been calculated at the rate of exchange stated in this Annexure.

Where Clause 71(5)(b), read with Clause 62(2) of the Special Conditions of Contract, applies, all payments will be made at the tendered rates of exchange.

In terms of Clause 71(5)(b)(iv) documentary proof shall be required and furnished in respect of each amount remitted overseas. Such documentary proof shall accompany the monthly statement following that remittance and shall contain the following information:

- the date,
- the currency and amount,
- the ruling rate of exchange,
- any further information required by the Employer.

In cases where the rate of exchange differs from the tendered rates of exchange, the monthly statement shall provide for Contract Price Adjustment.

Retention monies will be withheld until documentary proof of all overseas remittances have been received by the Employer.

The delivered-to-site price of all imported material shall include customs and/or dumping duties based on the rates of duties applicable to such material at the date of tender.

**NAME OF TENDERER:** \_\_\_\_\_

**SIGNATURE OF TENDERER:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

TENDER W \_\_\_\_\_

## QUALITY SYSTEM QUESTIONNAIRE

To be completed by the Tenderer in compliance with ISO 9002 or SABS 0157 - Part II

## 1. APPROVAL

Is the Tenderer approved by	Date	Equipment covered
- SABS		
- ESKOM?		
- OTHERS?		

2. ARE STANDARD FORMS OF QUALITY PLANS ATTACHED? YES/NO

## 3. DATA BOOKS:

3.1 Standard table of contents of data books attached? YES/NO

3.2 Are data books kept by the Tenderer?  
For how long? YES/NO  
..... PERIOD

3.3 Specify equipment that will be covered by separate data books.

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NAME OF TENDERER: \_\_\_\_\_

SIGNATURE OF TENDERER: \_\_\_\_\_

DATE: \_\_\_\_\_

### SCHEDULE OF QUALIFICATIONS/EXPERIENCE OF INSPECTORS

The bidder shall state hereunder the qualifications and experience of each inspector whom he proposes to employ in the execution of all or main sections of the works.

[illegible]

**SIGNATURE OF BIDDER**

DATE \_\_\_\_\_



## DEPARTMENT OF WATER AND SANITATION

### 1 VENDOR MASTER REGISTRATION AND MAINTENANCE

#### 1.1 Supplier detail verification:

National Treasury has implemented an electronic verification system (Safety Web) to verify the banking details of all Vendors with the Commercial Banks.

This means that the Vendor details for verification must be exactly the same as the record of the Banks, e.g.:

##### a) Individuals:

"Details should not be recorded as \_trading as\_, but as per the records of the particular Bank *(If the name of a vendor with the Bank is in a certain language, capture as it is with the Bank);*"

ID number is a compulsory field for individuals *(The Banks do verify the ID number and reject the supplier details if this information is not included or incorrect).*

##### b) Close Corporations:

"The name must end with CC or BK;"

"Registration number ends with 23;"

If verified details requires a CK in front or the back of the company registration number, e.g. CK1999/123456/23 or 1999/123456/23 CK it should be captured as such.

**Estate Late:** Must have an ID number (If the account was not closed and a new account opened in Estate Late it will be the same as if the account was opened when the person was still alive.

**Attorneys/Doctors:** ID number (For individuals) or Company registration number (If registered as a CC).

##### c) Companies:

"Company registration details have to be captured with the slash (e.g. 1195/012564/07);"

Use the table below as guideline.

Type of Entity	Company registration number	Wording that should appear in the name
Close Corporation	2000   000000   23	CC/BK
Private Company	2000   000000   07	Pty Ltd   Edms Bpk/Eiendoms Beperk/ Proprietary Limited/Pty Limited/Proprietary Ltd/ Edms Beperk/ Eiendoms Bpk
Public Company	2000   000000   06	Ltd/Bpk/Beperk/Limited
Trust	ITOOI 00	Not all Trusts have registration numbers and in such a case the ID number must be used.
Incorporated under Section 21	2000   000000   08	
Incorporated	2000   000000   21	Inc. ling

Before any details can be captured on Safetyweb, by Head Office for verification, the Vendor must provide the department with the banking details as captured and recorded with their banker. These details must be verified by the Bank against the following screens:

- i **FNB** - information must be according to the HOGAN System on the CIS4
- ii **NEDBANK** - Banking Platform under the Client Details Tab



- iii **ABSA** - information as captured on the CIF screen
- iv **Standard Bank** - information as per look-up-screen

Please note that the Banks will not provide these screens to the Vendor/Department but will merely validate the Vendor's details against these screens.

### **1.2 Capturing of Vendor details:**

Herewith some standard rules to comply with when capturing Vendor details:

- i Do not leave spaces and use only numeric characters in the account number field.
- ii Under no circumstances use the details on the cheque for verification of the name. Departments must verify the registered name of the company at the Bank.

### **1.3 Vendor master maintenance form:**

The attached Vendor Master Maintenance form must be completed by Vendors, Contractors and all Departmental staff that will be incorporated into the Trading Account.

No alterations to the form will be accepted, and the form should not be scanned and e-mailed.

#### **Section A:**

To be completed by the relevant Department of Water Affairs Office.

#### **Sections B, C, D and E:**

The Vendor must complete all the required fields.

#### **Section F:**

The Vendor must complete all required fields. Take note that the section must be fully signed (initials and surname as well as signature) by the Vendor as well as the Bank Official (including bank stamp).

#### **General:**

Please note that each SAP Vendor Master form must be supported by copies of one of the following documentation:

"Persal - Printout of function 4.3.1 (Enquiry: Specific Personal Particulars);"

"Individual - ID document;"

**Company** - Tax Clearance certificate or CK1 or SARS notice of registration or Tax invoice with printed VAT-number. If not register for VAT an ID document of owner and signed declaration that the company is not registered for VAT.

**Please ensure that all the fields are completed and that the information is clearly readable.**

### **1.4 Payment terms:**

The payment term defines the terms of cash discount percentages and payment methods.

The Vendor should indicate, in the space provided on the Vendor Master Maintenance Form what their payment terms are, e.g.:

- Z007 Payable immediately Due net
- Z001 Within 30 days Due net
- Z010 Within 30 days 1.5% Discount
- Z011 Within 30 days 2% Discount
- Z012 Within 30 days 2.5% Discount

Other payment terms will be applied on an ad-hoc basis, but it is the responsibility of the relevant Regional Office/ Construction Scheme to negotiate/inform their Vendors of this decision.

### **1.5 Contact persons:**

All completed Vendor Master Maintenance Forms must be returned to the relevant Department of Water and Sanitation.



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

SAP

Version 2  
03-Dec-07

### VENDOR MASTER MAINTENANCE

OFFICE  
USE ONLY

Created by  Authorise by

Date created   
d d m m y y

Date authorised   
d d m m y y

#### SECTION A: OFFICE (DWS) REQUESTING VENDOR MASTER (For official use only)

Indicate with and X

New Vendor  
Information ☐

Update Vendor  
Information ☐

OFFICE DATE STAMP

Office

Official's initials and Surname

Official's Signature

Telephone

Fax no

#### SECTION B: PERSONAL DETAIL OF VENDOR

Registered Name of Vendor  SARS Office (If applicable)

Trade name  VAT Number

Payment Term  Title if Applicable

#### SECTION C: ADDRESS OF VENDOR

Postal Address

Postal Code

Postal Code

#### SECTION D: TELEPHONE/FAX NUMBERS (Vendor Contact Details)

Contact Person (Vendor)  E-mail

Telephone Number  Fax number   
Area Code with number

Mobile Number  Preferred method of communication (Please select only one)  
Fax ☐ E-mail ☐ Post ☐

#### SECTION E: VENDOR DETAIL

Supporting documentation must accompany this form

Supplier Type ☐ Individual ☐ Department ☐ Partnership  
☐ Company ☐ Trust ☐ Partnership  
☐ CC ☐ Other (Specify)

### SECTION F: Vendor's Bank Details

I/We understand that the Department will not assume responsibility for any delayed payments, as a result of incorrect information supplied.

<b>Initials and Surname of Vendor</b>	<b>Authorised Signature of Vendor</b>	d d m m y y
<b>Registered name of Account Holder</b>	<div style="border: 1px solid black; height: 20px;"></div>	
<b>Bank Name</b>	<div style="border: 1px solid black; height: 20px;"></div>	
<b>Branch Name</b>	<div style="border: 1px solid black; height: 20px;"></div>	
<b>Branch Code</b>	<div style="border: 1px solid black; width: 100px; height: 20px;"></div>	
<b>Account Number</b>	<div style="border: 1px solid black; width: 200px; height: 20px;"></div>	
<b>*ID Number</b>	<div style="border: 1px solid black; width: 180px; height: 20px;"></div>	<b>*Compulsory for individuals</b>
<b>Passport Number</b>	<div style="border: 1px solid black; width: 100px; height: 20px;"></div>	
<b>**Company Registration Number</b>	<div style="border: 1px solid black; width: 150px; height: 20px;"></div>	<b>**Compulsory for Companies</b>
<b>***CC/CK Registration Number</b>	<div style="border: 1px solid black; width: 150px; height: 20px;"></div>	<b>***Compulsory where applicable</b>
<b>Practice Number</b>	<div style="border: 1px solid black; width: 180px; height: 20px;"></div>	

DATE STAMP OF BANK  
CERTIFIED AS CORRECT

TYPE OF ACCOUNT Indicate with X		It is hereby confirmed that the details have been verified against the following screens:
<input type="checkbox"/> 1	Cheque Account	<b>FNB</b> <b>ABSA</b> - CIF Screen - Hogans System on the CIS4 <b>STD</b> Bank - Look - Up - Screen <b>Nedbank</b> - Banking Platform under the Client Details Tab
<input type="checkbox"/> 2	Savings Account	
<input type="checkbox"/> 3	Transmission Account	

<div> <div></div> <div>Initials and Surname (Bank Official) who verified information against the relevant Bank Screen</div> </div>		<div> <div></div> <div>Bank Branch and Town/City where information has been verified</div> </div>		<div> <div> <div></div><div></div><div></div><div></div><div></div><div></div> </div> <div>d d m m y y</div> </div>	
<div> <div></div> <div>Signature (Bank Official) who verified information</div> </div>		<div> <div></div> <div>Telephone Number of Bank who verified information</div> </div>			

REPUBLIC OF SOUTH AFRICA

**FORM OF AGREEMENT  
(ERECTION)  
CONTRACT DWS 04-0419 WTE**

DEPARTMENT OF WATER AND SANITATION

(not to be filled in by Tenderers at the time of tendering)

THIS AGREEMENT made between the Minister of Water And Sanitation (or his duly authorised representative) acting on behalf of the Government of the Republic of South Africa (hereinafter called "The Employer") of the one part and \_\_\_\_\_

\_\_\_\_\_

(hereinafter called "The Contractor") of the other part.

WHEREAS the Employer is desirous that certain Works should be constructed viz.:

CONTRACT W \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

and has accepted a Tender by the Contractor for the design, manufacture, painting, delivery, off-loading, erection, commissioning, testing, completion and maintenance of such works.

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and constructed as part of this Agreement viz:
  - (a) The said Tender
  - (b) The Conditions of Contract (both General and Special) including instructions to Tenderers.
  - (c) The Specifications.
  - (d) Priced Schedule of Quantities
  - (e) The Drawings.
  - (f) The Annexures, Schedules, Forms and Appendices attached to the abovementioned documents together with any Addenda and amendments thereto.
  - (g) The Letter of Acceptance issued by the Office of the State Tender Board
  - (h) The Order
3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor covenants with the Employer to design, manufacture, deliver, off-load, install, commission, test, complete and maintain the Works in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the design, manufacture, delivery, off-loading, installation, commissioning, testing, completion and maintenance of the Works, the Contract Price at the time and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have set their hands and seals in the presence of the subscribing witnesses:

AT \_\_\_\_\_ for and on behalf of the Employer

on this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

AS WITNESS 1. \_\_\_\_\_ EMPLOYER \_\_\_\_\_

2. \_\_\_\_\_

AT \_\_\_\_\_ for and on behalf of the Contractor

on this \_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_

AS WITNESS 1. \_\_\_\_\_ EMPLOYER \_\_\_\_\_

2. \_\_\_\_\_

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF WATER AND SANITATION

PERFORMANCE BOND

CONTRACT DWS 04-0419 WTE

Whereas the Contractor: \_\_\_\_\_

of (address) \_\_\_\_\_

by an Agreement made between the Employer of the one part and the Contractor of the other part has entered into a contract, viz. Contract  
W \_\_\_\_\_, for \_\_\_\_\_

\_\_\_\_\_  
(hereinafter referred to as the Contract).

We, \_\_\_\_\_

represented by \_\_\_\_\_

in his capacity as \_\_\_\_\_

and \_\_\_\_\_

in his capacity as \_\_\_\_\_

being duly authorised thereto, do hereby bind ourselves as sureties in solidum and co-principal debtors for the due performance of the said Contract by the Contractor named above, and undertake to make good all losses, damages and expenses that may be suffered or incurred by the Employer, or any penalties and claims to which he may become entitled by reason of any failure of the Contractor to comply with any of the conditions of contract, and we hereby renounce all benefits from the legal exceptions ordinis seu excussionis et divisionis, with the meaning and effect of which we declare ourselves to be fully acquainted: Provided that our liability under this instrument shall be limited to and shall not exceed the sum of \_\_\_\_\_

\_\_\_\_\_ (R \_\_\_\_\_)  
being ten per cent of the contract amount and shall lapse thirty days after the issue of the Final Certificate under the said Contract, unless the sureties are before the expiration of the said thirty days advised in writing by the Employer of his intention to institute claims and of the particulars thereof, and in such an event this instrument shall remain in force until all such claims are paid or settled.

We acknowledge that upon the termination of this Bond the Employer shall, in terms of Treasury regulations, retain the cancelled document for the prescribed period.

DATED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ AT \_\_\_\_\_

SIGNATURE \_\_\_\_\_

WITNESS 1. \_\_\_\_\_

ADDRESS: \_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SURETY OFFICE STAMP



REPUBLIC OF SOUTH AFRICA

FORM OF MANUFACTURE PAYMENT BOND

CONTRACT DWS 04-0419 WTE

DEPARTMENT OF WATER AND SANITATION

(not to be completed at the time of tendering)

I, the undersigned, \_\_\_\_\_

Do hereby bind \_\_\_\_\_

as sureties in solidum and co-principal debtors in respect of such sums as may be paid by the Department of Water And Sanitation of the Government of the Republic of South Africa to:

\_\_\_\_\_

in terms of Clause 62(2)(e) of the Special Conditions of Contract for Contract No. \_\_\_\_\_ in respect of the manufacture or partial manufacture of equipment which has not been delivered to Site and undertake to make good all losses, damages and expenses that may be suffered or incurred by the Director-General of Water And Sanitation or any penalties or claims to which he may become entitled for reason of any failure of the Contractor to deliver such manufactured equipment to the Site in compliance with the provisions of the Contract and we, the said Sureties, hereby renounce all benefits from the legal exceptions ordinis seu excussionis et divisionis with the force and effect of which we hereby acknowledge ourselves acquainted provided that the liability of the said Company under this instrument ourselves is limited to and shall not exceed the sum of

\_\_\_\_\_ (R) \_\_\_\_\_

and will lapse thirty (30) days after all the said equipment has been delivered to the site unless the Sureties are, before the expiration of those thirty days, advised in writing by the Employer of his intention to institute claims in respect of the payment for such equipment and the particulars thereof and in such event this instrument shall remain in force until all claims thereunder are paid or settled.

DATED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ AT \_\_\_\_\_

\_\_\_\_\_  
SIGNATURE: \_\_\_\_\_

\_\_\_\_\_  
ADDRESS: \_\_\_\_\_

WITNESS 1. \_\_\_\_\_

2. \_\_\_\_\_

SURETY OFFICE STAMP

**DEPARTMENT OF WATER AND SANITATION**

**DELIVERY CERTIFICATE**

**FORM ME 2**

**CONTRACT NO. DWS 04-0419 WTE**

SCHEME/DAM: OLIFANTS RIVER WATER RESOURCES PROJECT, DE HOOP DAM

(CONSIGNMENT DATE: \_\_\_\_\_)

The Department hereby certifies that the following Item(s) have been received at site in good order and in quantities stated below:

TO BE COMPLETED BY CONTRACTOR				RESIDENT ENGINEER TO CERTIFY
DRG. NO.	ITEM NO.	ITEM DESCRIPTION	NUMBER CONSIGNED	NUMBER RECEIVED

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
SIGNATURE (RESIDENT ENGINEER)

\_\_\_\_\_  
NAME IN BLOCK LETTERS

\_\_\_\_\_  
DATE

\_\_\_\_\_  
SIGNATURE (CONTRACTOR'S REPRESENTATIVE)

\_\_\_\_\_  
NAME IN BLOCK LETTERS

\_\_\_\_\_  
DATE

CONTRACTOR'S ADDRESS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TELEPHONE:

\_\_\_\_\_

FAX:

\_\_\_\_\_

NOTE: This certificate shall accompany each consignment.

A copy of the duly completed and signed certificate(s) shall be submitted to the Director: Mechanical & Electrical Engineering together with the invoice for each consignment before payment is authorised. The above certificate(s) shall be submitted by the Contractor in the event of dispute.



**water & sanitation**

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF WATER AND SANITATION  
DIRECTORATE MECHANICAL AND ELECTRICAL ENGINEERING**

**CONTRACT W .....**

## **CERTIFICATE OF COMMISSIONING**

<b>REGION</b>	
<b>SCHEME</b>	
<b>SITE</b>	
<b>CONTRACT TITLE</b>	
<b>DESCRIPTION OF WORKS</b>	
<b>CONTRACTOR</b>	
<b>ENGINEER</b>	

This Certificate of Commissioning is issued subject to the compliance with the outstanding items listed in the Certificate of Practical Completion (previously issued) and the conditions that apply to them, together with such prescribed tests and period of operation as set out in the Contract conditions and -specification.

<b>DATE OF PRACTICAL COMPLETION</b>	
<b>DATE OF COMMISSIONING</b>	
<b>DATE OF COMMENCEMENT OF GUARANTEE PERIOD</b>	
<b>DATE OF EXPIRY OF GUARANTEE PERIOD (Subject to the Conditions of Contract)</b>	

The Engineer recommends that the Works be taken over from the Contractor for regular use by the Department during the Period of Guarantee, subject to the following:


It is hereby authorised that an amount NOT EXCEEDING:

- 5 % of the contract value (if 90 % of the contract value had previously been paid upon the issuance of a Certificate of Practical Completion)  
or
- 10 % of the contract value (if 80 % of the contract value had previously been paid upon the issuance of a Certificate of Practical Completion)  
may now be paid  
\*(scrap that which is not applicable).

SIGNED: .....  
Engineer

PRINT NAME: .....,

DATE: .....

SIGNED: .....  
Contractor

PRINT NAME: .....

DATE: .....

SIGNED: .....  
M/E Engineering Services

PRINT NAME: .....

DATE: .....

The Works have now been handed over to the Regional Director who undertakes to operate and maintain them as specified in the Operating and Maintenance Manuals received from the Contractor.

FOR AND ON BEHALF OF THE REGIONAL DIRECTOR:

SIGNED: .....

PRINT NAME: .....

DATE: .....

The Employer hereby acknowledges that the Works defined above have been commissioned on the date stated.

DIRECTOR: M/E ENGINEERING (Note: Signature no to be delegated):

SIGNED: ..... DATE: .....

**OLIFANTS RIVER WRDP  
DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

**SECTION 5:  
PROJECT SPECIFICATION**





## **PROJECT SPECIFICATION**



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**PS PROJECT SPECIFICATION****PS1 GENERAL DESCRIPTION OF THE WORK UNDER THIS SUB-CONTRACT****PS1-1 Description of the Project**

The De Hoop Dam, Phase 2A of the Olifants River Water Resources Development Project (ORWRDP), will be the bulk storage facility to augment the water supplies in South Africa's Limpopo Province. An Environmental Impact Assessment (EIA) has been completed, which has culminated in a Record of Decision (ROD) by the Minister of the Department of Environmental Affairs and Tourism, approving the implementation of the scheme in terms of environmental legislation (16 October 2006).

The proposed Phase 2A of the ORWRDP to be constructed under this contract, as well as the rest of the phases, to be constructed under other contract, will be defined below. Phase 2A basically consists of a dam on the Steelpoort River, on route from the town of Stoffberg to Steelpoort, next to the existing provincial road P169-1 (R555). It will be situated immediately downstream of the confluence of the Steelpoort River and the Klip River tributary joining from the eastern side.

Provision has been made to release water for the ecology in the Steelpoort and Olifants Rivers. Water will be released from the outlet works into the river, where it will be abstracted from the river at the town of Steelpoort via an abstraction weir and desilting works and pumped into an off channel storage dam. From the off-channel storage dam the water will be pumped to the Mooihoek Purification Works by means of a high lift pumping station. A pumping station will be constructed about 1 km downstream of the dam on the right bank of the Steelpoort River, from where raw water will be pumped upstream to the proposed ESKOM hydro-power pumped storage scheme. Water will also be supplied to the mining development at the town of Roossenekal through this pipeline. From this pumping station, water will also be supplied to the water scarce Jane Furse.

In summary, the ORWRDP comprises the following components:

Phase 1: The raising of Flag Boshielo Dam, completed in 2006.

Phase 2A: The De Hoop Dam on the Steelpoort River, approximately 40 km upstream of the town of Steelpoort. The dam wall will be approximately 1 015 m in length and 81 m in maximum height. At full supply level the reservoir will cover a surface area of approximately 1 690 ha and capacity of 347,6 million cubic metres. The dam is to be constructed from Roller Compacted Concrete (RCC) and conventional concrete. The outlet works situated on the right bank between the spillway and the right bank non-overspill section will be constructed of reinforced concrete.

Phase 2B: The 1<sup>st</sup> pipeline for the transfer of water from the Flag Boshielo Dam to Mokopane. The pipeline will be 70 km long, 800 mm in diameter and will transfer up to 24 million m<sup>3</sup>/annum of water, incorporating 4 reservoirs and 4 pump stations.

Phase 2C: The construction of an abstraction weir and de-silting works and low- and high lift pump station in the Steelpoort River as well as a balancing dam.

Phase 2D: The construction of the Steelpoort Weir to Mooihoek 2<sup>nd</sup> pipeline. The pipeline will be 15 km long, 1 000 mm in diameter and will convey up to 38 million m<sup>3</sup>/annum of water, incorporating a reservoir and a pump station.

Phase 2E: The construction of a pipeline parallel to the existing Lebalelo pipeline (Mooihoek to Lebalelo west) 2<sup>nd</sup> pipeline. The pipeline will be 18 km long, with the pipe diameter ranging from 800 mm to 1 000 mm and will convey up to 38 million m<sup>3</sup>/annum of water, from Mooihoek to the Havercroft junction and the Olifants River.

Phase 2F: The construction of the Lebalelo west to Olifantspoort pipeline. The pipeline will be 55 km long, with the pipe diameter ranging from 900 mm to 1 100 mm and will convey up to 34,5 million m<sup>3</sup>/annum, incorporating 4 reservoirs. The pipeline will connect the Olifantspoort pipeline with the Havercroft junction.



**Phase 2G:** The construction of a second pipeline from the Flag Boshielo Dam to Mokopane, parallel to the first pipeline.

**Phase 2H:** This phase will incorporate the existing Lebalelo Scheme Infrastructure into the ORWRDP.

The De Hoop Dam will augment the yield of the Steelpoort River by 80 Mm<sup>3</sup> per year.

It is a requirement that the impounding of the De Hoop Dam commences no later than October 2009 to overcome the threatening shortage of water for primary use and for mining users downstream of the Dam.

### **PS1-2 Description of the Dam**

The site of De Hoop Dam is situated on the Steelpoort River in the Sekhukhune District of the Limpopo Province.

The dam is designed as a 75 m high roller compacted concrete (RCC) gravity dam, with total crest length of 1 020 m. An uncontrolled spillway discharges flood water onto a concrete apron.

The Outlet works located on the right bank comprises:

- A multi-level twin intake structure 81 m high, with wet well bays and isolating valve chambers immediately downstream;
- Precast concrete trash racks protecting all intakes;
- Fine screen elements upstream of the bellmouth intakes;
- Isolating butterfly valves;
- Service shaft downstream of the wet well bays;
- Gantry crane in the downstream valve control room for handling valves;
- Gantry crane on top of the intake section for handling the fine screens and emergency gate as well as isolating valves;
- A staircase and lift shaft downstream of the isolating valve chambers;
- Water supply pipelines to the pipe outlet chamber on the right bank with river outlet pipes to sleeve valves in a control room;
- A 900 m long water supply pipeline to the Tshehla Trust with a discharge chamber at the end of the pipe line;
- Flow meter chambers on the right bank;
- The construction of about 170 m of 1 400 mm diameter NB steel suction pipe line, as well as a 1 600 mm diameter NB steel gravity pipe line (Phase 2C alternative gravity pipe line).

### **PS2 DESCRIPTION OF ACCESS TO THE DAM SITE**

The dam site is situated in the Steelpoort River in the Limpopo Province of South Africa and is approximately 40 km south of the town of Steelpoort, as indicated on the Locality Map in Section 9 of the document. The site and the surrounding area are in an environmentally sensitive area both from a social and natural point of view. With this in mind, the Contractor is to take note of the numerous social and environmental requirements for this Project.

Sensitive environments are any aspects of the surrounding biophysical or social environment that should be afforded additional care, protection or respect by the Contractor and his staff.

From Pretoria the shortest route is via the N4 to Middelburg, turning off onto route R555 to Steelpoort. From the R555 the access to site is shown on the attached route map.

### **PS3 DESCRIPTION OF THE OUTLET WORKS AND ACCESS THERETO FOR INSTALLATION**

The general arrangement of the outlet control building is shown on the Drawings with the sleeve valve chamber situated on the downstream side on the tower.

**It shall be noted that access for personnel down to and up from the outlet works will only be by way of a staircase along the downstream face of the dam wall.**

A 5 ton electric monorail gantry crane will be available for use by the Contractor in lowering valves into the emergency gate control room and for lowering and hoisting tools and other equipment between the crest and the emergency gate control room.

A 5 ton electric overhead crane will also be available in the emergency gate control room for use by the Contractor during installation of the sleeve valves and associated items.

The Contractor shall only use competent experienced workmen for operating the cranes and the use of cranes shall be entirely at the Contractor's own risk. Should the Contractor's use of cranes result in any damage to any one of the cranes, the damage shall be made good by the Contractor to the satisfaction of the Engineer, and the Employer reserves the right to alternatively deduct the cost of repair of such damage from any monies owed by the Employer to the Contractor.

#### **PS4 PROGRAMME FOR EXECUTION AND PENALTIES FOR DELAY IN COMPLETION**

The programme to be submitted by the Contractor within 4 weeks of the date of receipt of the Letter of Acceptance, as stated in the Appendix to Tender, shall be based on target date for delivery as stated in the Particular Specification of all the equipment under this Contract.

The following penalties shall apply to execution of the programme thus approved by the Engineer, i.e. to the completion dates in the Contractor's approved programme for the particular activities listed below:

- |   |                    |
|---|--------------------|
| • Completion of detail drawings required for manufacture:                   | R 1 000,00 per day |
| • Delivery, installation and testing of all equipment under this Contract:: | R 1 000,00 per day |
| • Completion of operation and maintenance manuals:                          | R 500,00 per day   |

#### **PS5 SITE FACILITIES ON OR NEAR THE DAM SITE**

The Contractor shall make his own provision for all accommodation facilities for his staff while working on Site. The cost of such facilities shall be included in the price for installation in the Bill of Quantities.

Storage of equipment brought or delivered to Site by the Contractor shall be arranged with the Main Contractor at least two weeks in advance.

#### **PS6 EXTENSION OF TIME DUE TO ABNORMAL RAINFALL**

Extension of time in terms of the Conditions of Contract arising from abnormal rainfall shall be calculated separately for each calendar month or part thereof in accordance with the formula given below. It shall be calculated for the whole period until completion of the contract including any extension thereof:

$$V = (Nw - Nn) + 0,050 (Rw - Rn)$$

If V is negative and its absolute value exceeds Nn then V shall be taken as equal to minus Nn.

The symbols shall have the following meanings:

V = Extension of time in calendar days in respect of calendar month under consideration.

Nw = Actual number of days during the calendar month on which a rainfall of 10 mm or more has been recorded.

Rw = Actual rainfall in mm for the calendar month under consideration.

Nn = Average number of days, as derived from existing rainfall records provided in Table 1.12.1, on which a rainfall of 10 mm or more has been recorded for the calendar month.

Rn = Average rainfall in mm for the calendar month, as derived from the rainfall records supplied in Table 7.1.



The total extension of time shall be the algebraic sum of the monthly totals for the period under consideration. Extensions of time for part of a month shall be calculated using pro rata values of  $N_n$  and  $R_n$ .

The factor  $(N_w - N_n)$  shall be considered to represent a fair allowance for variations from the average number of days during which rainfall exceeds 10 mm.

The factor 0,050  $(R_w - R_n)$  shall be considered to represent a fair allowance for variations from the average in the number of days during which the rainfall does not exceed 10 mm but wet conditions prevented or disrupted work.

Accurate rain gaugings shall be taken at the weather station to be supplied by the Main Contractor at a suitable point on Site as indicated by the Engineer and the Main Contractor shall at his own expense take all necessary precautions to ensure that the rain gauges cannot be interfered with by unauthorized persons.

**Table 6.1: Rainfall Record**

Rainfall Station No: 0593581 X Burgersfort Longitude: 30,333 Latitude: 24,683 Height: 793 m Period 1971 - 2004						
MONTH	AVE	STD DEV	N DAY RAIN	NUM MON	MAX R DAY	MAX RAIN DATE
January	92,7	60,2	5,0	26	95,0	1991/01/02
February	74,6	64,8	4,8	28	151,5	1985/02/08
March	59,0	37,5	3,9	31	80,0	1972/03/04
April	32,8	38,8	2,3	30	70,0	1976/04/12
May	6,8	10,3	0,9	31	26,5	1985/05/12
June	4,8	15,5	0,5	33	50,0	2000/06/16
July	2,6	6,0	0,5	33	31,0	1974/07/01
August	6,6	10,4	0,6	32	28,0	1983/08/08
September	12,5	21,4	1,3	31	50,0	2002/09/05
October	53,1	37,9	3,9	31	100,0	2003/10/07
November	85,7	54,5	5,9	31	80,0	2003/11/24
December	88,2	41,1	5,6	30	87,5	1981/12/29

Explanation of headings:

'AVE' represents the average rainfall for the month =  $R_n$

'STD DEV' represents the standard deviation from the normal

'N DAY RAIN' represents the average number of rain days per month exceeding 10 mm =  $N_n$

'NUM MON' represents the number of months used in the calculation

'MAX R DAY' represents the maximum rainfall that occurred over a 24-hour period (08:00-08:00)

'MAX RAIN DATE' represents the date on which the maximum 24 hour rainfall occurred

## PS7 QUALITY OF WATER

The chemical analysis of water from the hydrological gauging station B4H003 located upstream of the De Hoop Dam Site is given in Table 7.1. This indicates that the water is not corrosive.

Table 7.1: Water Quality Table

Element/variable	Unit	Mean	First Analyses	Last Analyses
CORR		0,19	Jun-99	Nov-05
Ca	mg/l	23,78	Nov-77	Nov-05
Cl	mg/l	9,30	Nov-77	Nov-05
F	mg/l	0,21	Nov-77	Nov-05
HARD-Mg	mg/l	59,43	Jul-05	Nov-05
HARD-Tot	mg/l	123,34	Jun-99	Nov-05
K	mg/l	1,35	Nov-77	Nov-05
LANGL-Index		0,43	Jun-99	Nov-05
Mg	mg/l	13,13	Nov-77	Nov-05
NH4-N	mg/l	0,04	Nov-77	Nov-05
NO3+NO2-N	mg/l	0,16	Nov-77	Nov-05
Na	mg/l	15,77	Nov-77	Nov-05
P-Tot	mg/l	0,09	Jan-85	Aug-05
RYZNAR-Index		7,71	Jun-99	Nov-05
SO4	mg/l	10,79	Nov-77	Nov-05
SOLIDS-Susp	mg/l	79,69	Mar-94	Sep-99
TEMP-Phys	° C	20,00	Oct-86	Oct-86
TURB-Phys	NTU	42,15	Mar-94	Sep-99
pH	pH units	8,00	Nov-77	Nov-05
pHs		7,74	Jul-05	Nov-05

**PS8      PREFERENTIAL PROCUREMENT SYSTEM**

Preference claimed shall be in accordance with the Tender Evaluation Criteria of the Tender Document.

**PS9      APPLICABLE SPECIFICATIONS**

This Project Specification shall be read in conjunction with the following Particular Specifications:

DHP40	GENERAL MECHANICAL
DHP43	HYDRO-MECHANICAL EQUIPMENT
DHP44	PIPES & SPECIALS
DHP45	VALVES
DHP46	CRANES, HOISTS AND WINCHES
DHP47	PASSENGER LIFT

The following Departmental Standard Specifications for mechanical works, which are available upon request, shall apply:

DWS 2020	QUALITY CONTROL
DWS 2510	VALVES
DWS 9900	PAINTING AND CORROSION PROTECTION

# **OLIFANTS RIVER WRDP DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

## **SECTION 6:**

### **PARTICULAR SPECIFICATIONS**

- **PARTICULAR SPECIFICATION DHP 40: GENERAL MECHANICAL**
- **PARTICULAR SPECIFICATION DHP 47: PASSENGER LIFT:**



**PARTICULAR SPECIFICATION DHP40**  
**GENERAL MECHANICAL**





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## PARTICULAR SPECIFICATION DHP40

### GENERAL MECHANICAL

#### DHP40.1 SCOPE

This section deals with the general requirements for mechanical equipment and installations and shall be read in conjunction with Particular Specifications DHP41 to DHP48. Any particular requirements stated in those Particular Specifications shall take precedence over Particular Specification DHP40.

##### DHP40.1.1 Modifications

Any modifications or deviations from the specification shall be indicated on the form "Proposed Alterations to Specification". The Contractor shall make no changes or modifications to any part of the design or the plant offered under this Contract without the written approval of the Engineer. The Department shall not accept any additional cost for any part of this Contract if this procedure has not been followed.

##### DHP40.1.2 Contracts

Contracts shall only be awarded to Tenderers who are properly equipped and capable of manufacturing to the specified standard. Only Tenderers who can prove that they are bona fide manufacturers of the equipment as described, with their own manufacturing and service workshop, may tender. Tenderers shall have a twenty four hour back-up maintenance and spare parts service available. Workmanship shall be of the best quality and welders shall be coded for the work being performed. The size of tools and equipment used shall be proportional to the task being carried out.

##### DHP40.1.3 Contingencies

The Engineer may make any variation of the form, quality or quantity of the Contract that in his opinion be necessary, up to an amount not exceeding 50 % of the Contract value. No such variation shall be made by the Contractor without an order in writing by the Engineer (see Clause DHP40.1.1).

#### DHP40.2 INTERPRETATIONS

##### DHP40.2.1 Definitions

In this Section the word or words:-

Design includes, as applicable, the submission of design documentation for approval by the Engineer,

Supply includes, as applicable, the purchase of materials or goods, manufacture and fabrication, any specified corrosion protection measures and any off-site inspection or testing,

Installation includes, as applicable, all handling and transport from storage, if necessary, all erection and setting to work, and

Tests on Completion includes, as applicable, the dry and wet tests as specified.

##### DHP40.2.2 Compliance with Standards

When reference is made to a code, specification or standard, the reference shall be taken to mean the latest edition of the code, specification or standard; including addenda, supplements and modifications and revisions thereto, unless otherwise specified.

The materials, design and workmanship shall be in accordance with the appropriate Specification current at the time of manufacture unless otherwise specified.



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.

### **DHP40.3 MATERIALS**

#### **DHP40.3.1 Introduction**

This Section 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 Section 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.

#### **DHP40.3.2 Materials - General**

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 Plant shall be new products of recognised reputable manufacturers with established dealerships and/or agencies in the Republic of South Africa and subject to the approval of the Engineer. Products shall be approved only when the Engineer 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.

#### **DHP40.3.3 Steelwork**

##### **DHP40.3.3.1 Steel for Fabricated Construction**

Mild steel for welded, riveted and bolted construction shall comply with SANS 1431: Weldable Structural Steels. Mild steel for load-bearing components shall not be inferior to Grade 300W.

Corrosion resistant steels used in construction shall comply with EN 1008 and that used for pressure linings shall comply with EN 10028-7.

The Contractor shall provide the Engineer with copies of mill rolling sheets for all sections incorporated in the Works, together with test certificates certifying that the steel has been tested and found to comply with the appropriate Standards. The Engineer reserves the right to test samples of steel independently

and the results of these tests shall take precedence over the tests carried out by the rolling mill. Marking by the steel maker and the mills shall comply with BS 4360.

#### **DHP40.3.3.2 Stainless Steel**

Unless otherwise specified, stainless steel shall have resistance to atmospheric corrosion not less than that provided by BS 970, Grade 304L.

Particular attention shall be paid to the prevention of seizure by fretting where two corrosion resistant metals are in contact, by the selection of materials of suitable relative hardness and surface finish and the application of lubricants.

Stainless steel shall be pickled and passivated after fabrication and welding; re-passivation may be ordered, post-installation, at no additional cost should there be evidence of ferrous re-contamination.

3CR12 type materials shall be supplied in No 1 finish from the material supplier's store.

#### **DHP40.3.4 Miscellaneous materials**

##### **DHP40.3.4.1 Cast Iron**

Cast iron shall be of the nodular or spheroidal graphite type to SANS 936/937 grade SG42 or to such other grade as is approved by the Engineer.

Cast iron shall not be used for components subject to impact stresses unless otherwise approved by the Engineer.

Before proceeding with foundry work for any castings which will be subject to hydraulic pressure and for all other important components, the Contractor shall submit to the Engineer for his approval Drawings of such castings, showing the proposed locations for taking specimens for tensile, impact, fatigue, bending and any other appropriate tests. Castings shall be clearly marked by the manufacturer.

The Contractor shall give the Engineer not less than 14 days notice in writing of the date when such castings will be cleaned to enable the Engineer to inspect the castings immediately after they have been cleaned. Whether or not the Engineer attends such inspection, no repair work shall be undertaken without the Engineer's prior approval.

Castings shall be true to the Drawings and any castings in which any dimension is so much reduced as to impair the strength of the casting by more than 10 % or to increase the stresses above specified limits, may be rejected by the Engineer.

The structure of the castings shall be homogeneous and free from excessive non-metallic inclusions and other injurious defects. Excessive segregation of impurities or alloys at critical points in a casting shall be sufficient cause for its rejection.

The Contractor shall perform all tests listed in SANS 936/937 together with the following additional tests on specimens from each batch:

- Each tensile test shall include determination of the 0,2 % proof stress value; and
- Three impact tests shall be performed on samples from each batch of castings at normal ambient temperatures and 3 further tests at an ambient temperature of -30°C. The average impact value of each set of tests shall be such as will be suitable for the operational temperatures of each item made from the batch, as agreed with the Engineer.

The Contractor shall non-destructively test all castings using radiographic, magnetic particle, penetrant and ultrasonic flaw detection methods as appropriate, similar to those specified in BS 4080 and as agreed with the Engineer.

Subject to the approval of the Engineer, minor defects shall be chipped or grooved out by a carbon arc air process to sound clear metal and repaired by welding. Castings with defects which do not otherwise affect the performance of the castings but which necessitate the removal of metal resulting in a reduction in the stress-bearing cross-section of a component by more than 20 % may be rejected by the Engineer.



Welding shall only be carried out by properly qualified welders and all such repairs shall, unless otherwise agreed by the Engineer, be subject to stress relief.

Before carrying out any repairs the Contractor shall submit to the Engineer for his approval a complete statement of procedure for such repairs together with, where appropriate, stress calculations and no repair work shall commence until the Engineer's written approval of such statement and calculations has been received.

In addition to tests carried out under sub-clause (g), and if so instructed by the Engineer radiographic and/or ultrasonic testing and/or other approved non-destructive testing shall be carried out on the areas around all defects in any casting after removal of metal to ensure that each defect has been properly removed.

Certified copies of the results of any test required shall be furnished to the Engineer.

#### DHP40.3.4.2 Steel Castings

The steel used for castings shall be of the quality appropriate to each particular item as approved by the Engineer and shall comply with the relevant British Standards included in BS 3100. Castings shall be heat treated as agreed in writing by the Engineer.

The Contractor shall perform all the tests listed in BS 3100, together with the following additional tests on specimens from each batch:

- (a) Brinell hardness tests together with copies of test certificates; and
- (b) The impact tests specified in Clause DHP40.3.4.1.

#### DHP40.3.4.3 Forgings

Steel for forging shall be of the quality appropriate to each particular item, shall comply with BS 29 or BS 970, as appropriate and shall be subject to the approval of the Engineer.

All forging shall be heat-treated for the relief of residual stresses before the start of machining and the Contractor shall submit details of his proposed method to the Engineer for his approval in writing before starting the treatment.

The forging shall be inspected by the Contractor using radiographic methods similar to those set out in BS 4080 for steel castings and also using the ultrasonic, magnetic particle and penetrant flaw detection testing techniques set out in BS 4124.

The Engineer shall be informed in writing of all flaws found by the inspection and the Contractor shall not use in the Works any forging containing flaws unless remedial action is agreed with the Engineer and carried out by the Contractor to the satisfaction of the Engineer.

#### DHP40.3.4.4 Fabrics and Wood, etc.

Fabrics, cork, paper and similar materials that are not subsequently to be protected by impregnation, shall be treated with an approved fungicide. Sleeving and fabrics treated with linseed oil varnish shall not be used.

The use of organic materials shall be avoided as far as possible but where these have to be used they shall be treated to make them fire resistant and non-flame propagating.

The use of wood shall be avoided as far as possible. If used, woodwork shall be thoroughly seasoned teak or other approved hardwood that is resistant to fungal decay and free from shakes and warp, sap and wane, knots, faults and other blemishes. All woodwork shall be treated to protect it against damage by fire, moisture, fungus, bacteria or chemical attack, unless it is naturally resistant to those causes of deterioration. All joints in woodwork shall be dovetailed or tongued and pinned. Metal fittings shall be of non-ferrous material. Adhesives shall be specially selected to ensure the use of types that are impervious to moisture. Synthetic resin cement only shall be used for joining wood. Casein cement shall not be used.

#### DHP40.3.4.5 Bronze

Where bronze is specified or used it shall be zinc free.

#### DHP40.3.4.6 Bright Parts

Bright parts and bearing surfaces shall be thoroughly polished and protected from corrosion by the application of rust preventive lacquer or high melting-point grease, as approved by the Engineer, before the parts are packed. A sufficient quantity of the correct solvent for removal of the protective compounds shall be supplied and packed with each particular part.

#### DHP40.3.4.7 Aluminium and Aluminium Alloys

Aluminium and aluminium alloys used in mechanical parts shall be for the approval of the Engineer.

#### DHP40.3.4.8 Adhesives

All adhesives shall be specially selected to ensure use of types that are impervious to moisture and are resistant to mould growth and other forms of attack or deterioration.

#### DHP40.3.4.9 Asbestos

Asbestos and materials containing asbestos shall not be used.

### DHP40.4 PLANT FOR INSTALLATION AND ERECTION

The Contractor shall utilise such plant and equipment as is necessary to safely and efficiently carry out the installation / erection, testing and commissioning of the Works.

### DHP40.5 DESIGN AND CONSTRUCTION

#### DHP40.5.1 Operating Conditions and Climate

##### DHP40.5.1.1 Water Quality

###### (a) Suspended Solids

Flow is drawn off into the service intakes from the reservoir which acts as a silt trap, and hence is not expected to contain coarse solids in suspension, although a degree of turbidity is likely after heavy flood run-off into the reservoir and down the river.

###### (b) pH

Refer to the Project Specification.

The Plant shall be suitable for operating under all conditions having regard to any corrosive properties of the water and taking into account the effect of any bacterial action which may arise and special consideration shall be given to the corrosion protection of all permanently immersed parts where maintenance painting is not possible after Tests on Completion.

###### (c) Water Temperature

Refer to the Project Specification.

##### DHP40.5.1.2 Climate

The Plant shall be suitable for operating satisfactorily under the climatic conditions as given in the Scope of Works. The Contractor shall ascertain such additional information he considers necessary for the design of the Plant.

The Plant shall be designed and manufactured with due attention to its installation and satisfactory operation, inspection and maintenance under conditions prevailing at the Site at ambient temperatures giving rise to steelwork temperatures between -5°C and 50°C. The general provisions shall include but not be limited to:-

- (a) Provision for facilitating transport to and erection at the Site, inspection, maintenance, cleaning, and repairs;
- (b) Provision for ensuring the safety of the Works at all times as well as the safety of personnel concerned with manufacture, testing, installation, Tests on Completion, operation and maintenance;
- (c) Availability of the Plant and thorough reliability of operation throughout the full range of seasonal climatic conditions at the Site; and
- (d) Remain operational for a period of at least 30 years.

#### **DHP40.5.2 Design and Permissible Stresses**

##### **DHP40.5.2.1 General**

- (a) The Contractor shall design the relevant parts of the Works to the Engineer's satisfaction and in accordance with the Specification, subject to such modifications as may be agreed under the terms of the Contract.
- (b) The design shall be in accordance with the best modern practice and shall be such as will facilitate operation, inspection, cleaning, repainting, lubrication, maintenance and repair to ensure the highest reliability of operation under all service conditions.
- (c) The Contractor's design calculations shall be submitted to the Engineer with the appropriate Drawings for approval. The calculations for principle stresses of the main components of the equipment shall be submitted with the Tender. Failure to do so may disqualify the Tenderer.
- (d) Approval by the Engineer of the Contractor's design and/or Drawings shall not relieve the Contractor of any of his obligations or liabilities under the Contract.
- (e) Generally, the design shall be such as to provide the maximum reliability under all conditions of service, coupled with safety and convenience of operation and maintenance under all conditions at the Site.
- (f) The design, dimensions and materials of all parts shall be suitable for the specified service and be such that the stresses to which they may be subjected shall not render them liable to buckling, breaking or excessive wear.
- (g) A copy of the hydraulic model test report (where appropriate) shall be made available.
- (h) The arrangements and details shall be simple and robust. All moving parts shall work silently and be readily accessible for removal, maintenance and repair. All parts shall be designed, proportioned and supported so as to withstand, without undue deflection or deformation, the forces that may be applied to them.
- (i) Special measures shall be taken to prevent malfunction due to corrosion, to minimise risk of fire and to prevent ingress of dust, dirt, moisture and vermin.
- (j) The designs shall be in accordance with the applicable requirements of the Occupational Health and Safety Act, Act 95 of 1993.

##### **DHP40.5.2.2 Vibration and Design Loads**

- (a) Special care shall be taken to ensure that all items of Plant are free of harmful vibration. Special care shall also be taken to ensure that resonance of any part does not occur as a result of harmonics which, although not apparent when the item in question is tested by itself, nevertheless give rise to objectionable vibrations when it is installed in its final position.



- (b) The Contractor shall, without additional payment, take whatever steps may be necessary after erection to remedy any vibration which the Engineer considers harmful.
- (c) All fastenings on Plant which may, notwithstanding the above provisions, be at risk of vibration under certain combinations of loadings and operating conditions shall be designed, by means of lock washers or by other approved means, not to work loose due to vibration or other cause.
- (d) Design loads and load cases shall include those set out in DIN 19704/5: Hydraulic Steel Structures: except that:-
- (i) Impact by ships and friction by ships shall not be considered;
  - (ii) Seismic conditions shall be considered, with the simultaneous application to all parts of the Works of a seismic event having a vertical acceleration of 0,06 g and a horizontal acceleration of 0,08 g (hereinafter referred to as the "Design Basis Earthquake" or DBE) applied in the most adverse combination and direction;
  - (iii) In respect of the design of the gates (and associated hoist and hoist gantry) the provisions of Clause DHP40.5.2.2 d) (ii) above shall be applied under the following conditions;
    - Gates closed and subject to the specified maximum water levels; and
    - Gates partially open in still water or in air at any vertical position.
  - (iv) In respect of the design of the hoists and cranes the provisions of Clause DHP40.5.2.2 d)(ii) above shall be applied under the following conditions;
    - Fully loaded at any vertical position.
  - (v) The criteria for approval of the response of mechanical equipment to the DBE shall be that all components of the Plant in question shall, after the seismic event, remain broadly operational without the need for other than minor adjustment. In particular, permanently submerged components (such as gate guides) shall not be distorted to such an extent so as to prejudice correct operation of the gates after the most adverse combination of gate position and vertical and/or horizontal seismically induced forces.

#### DHP40.5.2.3 Permissible Stresses: General

- (a) The Plant shall be designed such that no part of the Works under any loading condition shall impose any stress greater than those set out below on or in any concrete work:
- (i) For compressive bearing stress: 7,0 MPa;
  - (ii) For shearing stress: 1,7 MPa; and
  - (iii) No tensile stress shall be allowed in concrete.
- (b) Under the most severe operating and/or erection condition, stresses in castings and forgings expressed as percentages of yield point (tensile, shear or compression as the case may be) or proof stress (0,1% or 0,2% for tensile, shear or compression as the case may be) shall not exceed the figures set out in the table below. Grey cast iron is measured against the ultimate tensile strength of the material.

Table DHP40. 1 : Maximum stress percentages			
Material	Tension	Compression	Shear
Grey cast iron (% tensile strength)	10 %	20 %	6 %
Nodular cast iron	33 %	50 %	33 %
Carbon or low alloy cast steel	33 %	50 %	33 %
High alloy cast steel	33 %	50 %	33 %
Carbon and high alloy forgings	50 %	50 %	50 %

- (c) The value of tensile strength to which the tabulated percentages shall be applied shall be the tensile strength (as defined in BS 18) of the proposed grade of metal as guaranteed by the supplier of the metal on the basis of tests carried out in accordance with BS 18.

#### DHP40.5.2.4 Permissible Stresses: Gates, Stoplogs, Valves

- (a) All structural steel parts shall be manufactured from steel conforming to SANS 1431, Grade 300W, or equivalent standard. The grade classification shall be decided on the basis of notch ductility and corrosion requirements.
- (b) Permissible stresses for this steel shall be determined according to SANS 10162: 1984: "The Structural Use of Steel". These stresses are to be multiplied by the following coefficients to allow for indeterminate factors:
- |                                    |      |
|------------------------------------|------|
| ▪ Valves:                          | 0,85 |
| ▪ Sliding gates/ stoplogs:         | 0,90 |
| ▪ Gates (jet flow, if applicable): | 0,85 |
- (c) When calculating the stresses including transient and earthquake forces, the primary stresses shall not exceed 80 % of the yield stress of the material used and where secondary stresses are included the stress shall not exceed 85 % of the yield stress of the material used.

#### DHP40.5.2.5 Permissible Stresses: Linings

- (a) The permissible working stresses for all steel linings and transitions shall not exceed that given in BS 5500. Where the proposed steel is BS 1501-223 - 490A a basic permissible working stress of 223 MPa shall be used. If steels other than the above are proposed the permissible working stresses shall be as obtained from BS 5500, but in this case special consideration shall be given to the other requirements of BS 5500 regarding welding details, pre-heating, stress relieving, weld joint factor, handling, etc.
- (b) Radiographic inspection shall be done for 100 % of the longitudinal welds and where possible, of the circumferential welds including the joint between the circumferential welds and the adjacent longitudinal welds. In addition all in-situ (field) welds shall be 100 % radiographically or ultrasonically inspected. The joint factor to be used in design shall then be taken as 1.0 and the design is based on this factor.

### DHP40.5.3 Contractor's Drawings

#### DHP40.5.3.1 General

Drawings that do not conform to the requirements as set out in this Specification shall be returned to the Contractor and payment shall not be made until these requirements are met.

- (a) Drawings provided by the Contractor shall be size A1 produced in hard copy and electronically in AUTOCAD "dwg" format.
- (b) Each Drawing shall show the following particulars in the lower right hand corner:-
- Name of Employer
  - Name of Engineer
  - Name of Contractor
  - Project title
  - Contract number
  - Title of Drawing (Location, item and detail)
  - Scale
  - Date of Drawing
  - Details of electrical supply (where applicable)

- Drawing number
  - Revision identification
  - Departmental registration information as indicated on Drawing Reg. No BF 1819
- (c) Dimensions on all Drawings shall be metric.
- (d) All legends shall be in English.
- (e) A blank space 90 mm by 60 mm shall be provided as an extension of the title block for the Engineer's approval stamp. Provision shall be made for details of revisions to be recorded above the title block. Prints of Drawings (excluding those provided for record keeping) shall be in the form of black lines on a white background.

#### DHP40.5.3.2 Tender Drawings

Unless detailed manufacturing drawings (e.g. pipe work, emergency gate) are included in this Tender, the Mechanical portion of the Tender Drawings provided are simply configuration guidelines to enable the Contractor to determine the Plant required to be designed and detailed by the Contractor.

Drawings submitted by the Contractor with his Tender shall give sufficient information to make a proper assessment of the Plant offered together with sufficient detail to enable the dimensions and general arrangement of the Plant to be determined. All the important parts shall be shown in detail, i.e. gate body, scaling arrangements, bearing arrangements, guides, wheels, etc.

They shall include details of parts to be built into, and loads to be transferred to, the civil engineering works, routes and sizes of cabling, cable ducts or trunking, hydraulic pipework, description of erection methods, operating and control units, position indicators and details of connections to any other equipment.

#### DHP40.5.3.3 Manufacturing Drawings

After receipt of the Letter of Acceptance but before manufacture commences, working Drawings containing general arrangements and assemblies for the Plant, including material schedules, standard parts etc., shall be provided for approval in principle by the Engineer.

Drawings shall provide all the information required by the manufacturer to ensure full compliance with the Drawings and Specifications.

Drawings shall be in standard sizes, but not exceeding the A1 size (preferred size is A-1). The drawings shall be clear, black line on white paper and unfolded. Drawings shall be prepared to acceptable industry standards complying with SANS 10111. An example of the Drawings shall be submitted for approval before draughting commences.

Approval by the Engineer of any Drawing shall not relieve the Contractor of responsibility for correct fitment on Site.

The Engineer retains the right to suspend manufacture until approved working Drawings are in his possession.

#### DHP40.5.3.4 Site Construction Drawings

Where appropriate, Drawings to enable Site preparations to be completed shall be provided before the arrival of equipment, giving all details necessary for the programming of civil works, including foundation details and anchor bolts. These Drawings shall be provided not later than three weeks after approval of the layout Drawings has been given in principle.

#### DHP40.5.3.5 Record Drawings

A complete set of "As made" drawings shall be provided in black on untearable plastic film having a polyester base. The drawings shall be complete in all respects, drawn generally in accordance with SANS 10111 and the Departmental document *STANDARDS FOR THE PREPARATION OF*



**MECHANICAL ENGINEERING DRAWINGS** and shall contain general arrangements, assemblies, parts lists (including part numbers) and complete component details.

Drawings shall be in standard sizes, but not exceeding the A1 size (preferred size is A-1). The drawings shall be clear, black line on white paper and unfolded. They shall be suitable for photographing for microfilming and scanning purposes. A draft drawing shall be submitted to the Engineer for approval of the printing standard before the complete set is supplied. In addition, drawings shall also be provided in AUTOCAD \* dwg electronic format on compact disc, complete with plot set-up files.

The standardised title block as prescribed by the Engineer shall be used on all drawings. On each drawing shall be stencilled in bold letters the name of the scheme and dam. Drawings that do not conform to the above requirements shall be returned to the Contractor. See also of Particular Conditions of Contract for General Mechanical and Electrical Works

In addition to the above, the Department will issue key information to the Contractor, i.e. Departmental drawing number, codes, etc. which shall be included on all documentation and drawings.

#### **DHP40.5.4 Contractor's Submissions**

Within 28 days of the date of the Commencement Date, the Contractor shall commence to submit for the Engineer's approval, and before manufacture is started, all the submissions required by the Specification.

Drawings, to be submitted in the manner prescribed in Clause DHP40.5.3, shall include those listed below. The Contractor shall continue to make submissions at a reasonable rate so that all designs and Drawings are completed within a further 56 days. Manufacture shall not be commenced until the Engineer's approval has been given.

The Contractor shall carefully check each of his submissions and those of his Subcontractors and before forwarding those to the Engineer for approval shall sign each submission to certify that it has been checked by him. The Engineer will not examine any submission which has not been so certified. The Engineer shall, within 14 days of receipt, signify his approval or refusal thereof.

Submissions to be made include:

- (a) Preliminary drawings, the purpose of which is to enable the Engineer to proceed with or check the design of civil engineering or other works, shall show the layout and dimensions of the Plant, details of loads to be carried and the positions and dimensions of foundations, supports, ducts, openings in walls and floors and all other necessary details.
- (b) Drawings for approval by the Engineer:-
  - (i) General arrangement drawings which shall be dimensioned and shall show the Plant and ancillary equipment to be supplied under the Contract.
  - (ii) Contractor's and manufacturer's design and shop drawings of all equipment showing connections between the various items of equipment.
  - (iii) Submissions such as Calculations, Manuals, Programmes, Quality Plans, Progress Reports, Packing Lists, Samples and Test Reports as required by the Specification.
  - (iv) Such other drawings as the Engineer may require.
- (c) These drawings/submissions (together with any of the said preliminary drawings which may be suitable), having been corrected or amended as necessary to the Engineer's approval, shall become the drawings/submissions to be used for the execution of the Works and no drawings/submissions other than these drawings/submissions shall be used for such purpose without specific instructions, in writing, from the Engineer.
- (d) Copies of all approved drawings/submissions shall be provided for the Engineer's use during the course of the Works. Approval of any drawing/submission shall not relieve the Contractor of any of his responsibilities under the Contract.

- (e) Copies of all other drawings for all equipment being provided under the Contract shall also be provided to enable the Engineer to have a full understanding of the Plant, but these shall not form part of the approved drawings.
- (f) Record drawings: The Contractor shall ensure that the approved drawings are marked up to show the condition of the Works as installed and 4 copies of such marked up prints shall be submitted to the Engineer for approval prior to the preparation of the record drawings.
- (g) Within 84 days of the whole of the Plant or parts thereof having been taken over, the Contractor shall provide one complete set of record drawings to show the whole of the Plant as installed and shall include all general arrangement and detail drawings, diagrams and schedules produced. Information shown shall include tolerances, clearances, loadings, finishes, materials and ratings.
- (h) Where the Contractor proposes to supply materials not of his own manufacture or otherwise to subcontract part of the Works, the Subcontractor indicated on the form "Schedule of Proposed Subcontractors" by the Contractor when tendering, shall not be changed without the prior approval in writing of the Engineer.
- (i) Purchase orders placed on suppliers of other Plant shall be made available to the Engineer upon request.

#### **DHP40.5.5 Workmanship**

##### **DHP40.5.5.1 General**

Workmanship and general finish shall be of first class commercial quality and in accordance with best workshop practice.

The fabrication, machining and finish (including corrosion protection finishes) 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. Finished faces shall be free of any wind or twist.

All similar items of Plant 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 Plant. 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 that can be worn or damaged by dust shall be totally enclosed in a dust-proof housing.

Manufacturers of stainless steel items shall comply with the "Stainless Steel Good Housekeeping Rules" as issued by SASSDA from time to time.

##### **DHP40.5.5.2 Lamellar Tearing**

The Contractor shall design, detail and fabricate all junctions in steelwork in such a way as to prevent failure by lamellar tearing.

##### **DHP40.5.5.3 Structural Steelwork Fabrication**

Fabrication of structural steelwork shall be generally in accordance with BS 5400 unless otherwise specified.

The Contractor shall ensure that all surfaces requiring corrosion protection are either:

- (a) Accessible, to the satisfaction of the Engineer, for maintenance of the protection by reasonable methods when in position in the Works; and
- (b) Enclosed in hermetically sealed voids, where it is structurally safe to seal such voids, and as agreed in writing by the Engineer, which shall be proved to be sealed by air pressure testing if required by the Engineer.

All permanently exposed edges and corners of members of fabricated steelwork shall be formed or dressed to a rounded profile with a minimum radius of approximately 3 mm to ensure an even coating of the protection to such parts of the fabrication.

All cutting, chamfering and other shaping of metals necessary for site connections shall be done in the shop. Adequate provision for temporary bolted site connections or clamps shall be provided to hold assemblies rigid and in proper alignment during site welding. After welding, all temporary connections and clamps shall be removed and all bolt holes shall be plugged, welded over and ground down flush with the adjacent metal on both faces, all to the satisfaction of the Engineer.

Bending and pressing of plates may be by either the hot or cold process. In no case shall the internal radius of bends in cold-bent plates be less than twice the thickness of the metal. The procedures used, including temperature control in the case of hot-forming, shall be to the approval of the Engineer. Where necessary, allowance shall be made in the design for possible modification of material properties.

Edges of all plates and members shall be square, clean, free from burrs and true to dimensions. If flame cutting is employed, edges shall be dressed smooth and true.

All bolts and nuts shall be in accordance with SANS 1700.

#### DHP40.5.5.4 Surface Defects in Fabricated Steelwork

All fabricated steelwork shall be free of surface defects in the steel, burrs, sharp or rough edges, crevices, cracks or discontinuities in welded joints and depressions, hollows or moisture retaining features in locations where rain, spray or condensed moisture left in contact with the structure may promote corrosion of the steel. The dressing of the steel to remove burrs and rough edges from holes or cut lines shall be carried out as soon as possible after their presence has been detected consistent with the need to clean and give initial protection to exposed steel elsewhere on the plate, section or fabrication concerned.

Surface defects shall be ground out. The extent and depth of laminations shall be determined before any rectification is carried out. Provided the size and extent of any surface defect or lamination is not such as to warrant rejection of the steel plate or member on structural or other grounds, the area affected by the remedial work shall be cleaned and protected to the same standard as the rest of the plate or member.

Where necessary (e.g. to meet dimensional tolerances) the steel surface at such defective areas may be built up by welding including any preheating that might be required and ground flush with the surrounding steel surface before being cleaned and protected. This welding is to be stress-relieved by an approved post-weld heat treatment as approved by the Engineer.

#### DHP40.5.5.5 Welding

All welding shall comply with the general requirements of BS 5400 (except as amended by the Merrison Interim Design Rules should the Contractor wish to submit designs of gates or other parts of the Works involving box girder construction). Double U or J welds shall be adopted where control of distortion is important.

All welding whether in the shop or at Site shall be approved metal-arc processes and shall be in accordance with BS 5135 subject to the provisions of this Clause. Full details of welding procedure and detail Drawings of welds and weld preparations shall be submitted to the Engineer for his approval and 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 and no alteration shall be made to any previously approved procedure without prior approval of the Engineer.



All welders shall be qualified in accordance with BS 5400 or in accordance with such appropriate sections of BS 4871 or BS 4872 as the Engineer may approve to. 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 shall 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.

All welds shall be identified to enable each weld to be traced to the welder by whom it was made. The form and location of all identification marks shall be proposed by the Contractor and shall be subject to the approval of the Engineer.

The preparation of joint faces shall be by machining except as otherwise approved by the Engineer. Where errors in joint preparation lead to larger gaps between fusion faces than permissible, these shall not be bridged over but the faces shall be made up with weld metal and re-machined as necessary to the correct profile before welding proper commences.

Where deviation from true profile of fusion faces occurs due to mill tolerances in rolled sections, fitting up and welding shall be in accordance with a procedure to be agreed between the Contractor and the Engineer. To this end the Contractor's statement of welding procedures shall contain proposals for dealing with such deviations.

Pre-heating shall be carried out as recommended in BS 5135 or other appropriate British Standard.

The full throat thickness shall be ensured at the ends of butt welds by the use of extension pieces or by other approved means. If extension pieces are used they shall be clamped to the work and not welded. To ensure full penetration in butt welds, the use of backing material shall not be permitted except as approved by the Engineer.

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

Removal of slag from welds that 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, 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.

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.

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.

All fabrications which are subsequently to be machined in any way shall be stress relieved prior to machining.

Shop and Field Fabrication Method Statements / QCP's shall be provided detailing welding distortion mitigation or elimination strategies before manufacture commences. The Engineer reserves the right to halt any work should this issue not receive the necessary attention.

#### DHP40.5.5.6 Bolting

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. 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 SANS 1700.

Mild steel bolts, rag bolts, nuts and washers shall conform to SANS 1700. 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 SANS 1700 A70 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.

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 shall 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 -0,20 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.

Washers of the same grade as the bolt and nut shall be installed under both the bolt head and nut of all bolted joints.

All bolt holes shall be drilled, not punched. Templates shall be used where applicable.

Large washers of at least twice the thickness of a standard washer shall be used on all fasteners going through slotted holes.

#### **DHP40.5.5.7 Hydrogen Embrittlement in Fasteners**

Metal coatings and other treatments applied to fasteners shall be carried out in a manner that shall not cause hydrogen embrittlement of the parent material.

#### **DHP40.5.6 Bearings**

The material from which all parts of bearings, including housing, spigots and bedplates are to be made shall be in accordance with the bearing manufacturer's recommendations and as approved by the Engineer.

The surface finish, dimensions and tolerances of all parts of bearings including the shafts and housing shall be similarly agreed.



Each bearing shall be designed to safely transmit axial and radial loads likely to be applied to it under all conditions, both during operation and at rest. The L10 design life of rolling bearings shall not be less than 10 000 hours based on the most severe dynamic and static load condition, whichever is the more severe, for the particular bearing. Bearings subject to daily movement due to thermal effects shall be designed to operate for not less than 50 years. In addition to the above, bearings shall be designed and manufactured from materials suitable for carrying static loads for not less than 50 years with very infrequent operation.

Each bearing shall be so installed that it can be removed for maintenance or replacement without damage to either the bearing or the adjacent parts of the Plant.

All bearings, including self-lubricating bearings, shall be sealed against the ingress of deleterious contaminants and shall be provided where necessary with means of lubrication to the centre of the bearing so that any foreign matter is expelled through the end seals.

Each bearing shall be lubricated as specified, the lubrication stations being situated in weatherproof and accessible positions.

Except in the case of roller bearings which shall be installed generally in accordance with the bearing manufacturer's recommendations, the backing plates, outer sleeves (or housing) and the inner sleeves (where provided) of bearings shall be fixed to their respective adjacent structural members by such positive mechanical means as keying or similar, so that the movement in the bearing shall take place only between the bearing surfaces.

Where the housing of any bearing is welded to steelwork the housing shall be machined to the required tolerances to receive the bearing after completion of fabrication and heat treatment.

Where bearing housings are bolted in steelwork the design of the connection shall be such that distortion of the bearing housing does not occur when it is tightened down.

All bearings except self-lubricating bearings, which when in use will be subject to small displacements or small angular rotations only, shall be run-in before incorporation in the Plant. Each self-lubricating bearing shall either be run-in or prepared and precoated so that the lubricant is evenly distributed over the whole bearing surface. All other bearings shall be run-in before the start of or during the site tests. The Contractor shall not start running-in any bearing or group of bearings until he has received the approval of the Engineer of the intended duration and method of such running-in.

#### DHP40.5.6.1 Self-lubricating Bearings

These bearings may be of the plain type or, where the alignment of the bearing is subject to change under varying loads due to structural deformations of the gates or other parts of the Plant, shall be of the self-aligning type.

Self-aligning bearings shall have an inner spherical section manufactured from aluminium nickel bronze and a split outer housing of stainless steel all to the approval of the Engineer.

The spherical surface shall be for taking misalignment and the bearing shall run on the cylindrical inner surface. The split housing shall be locked against rotation.

The spherical and cylindrical surfaces shall be inlaid with and covered with solid lubricant.

The lubricant shall have non-deteriorating characteristics and shall be capable of withstanding the effects of long-term exposure to atmospheric pollution and submerged environments at the Site. The Contractor shall satisfy himself as to the atmospheric and submerged environments at the Site.

The lubricant shall be epoxy based and shall be free of graphite and all other constituents that may lead to fretting corrosion, electrolytic corrosion or chemical action of any part of the bearing.

The lubricant shall be contained in recesses machined in the inner diameter and spherical surface of the bronze ball section. The recesses shall cover an area of not less than 30 % of the projected area of the bearing surfaces. The lubricant shall be compressed into the recessing by a pressure of at least twice the designed unit loading.

The lubricant shall be compatible with greases used during assembly and subsequently injected during operation for the exclusion of moisture and dirt.

The surfaces on which bearings rotate and or slide shall have a hardness exceeding that of the bearing material by 100 points on the Brinell Hardness scale or as otherwise required by the bearing manufacturer and as agreed by the Engineer.

#### **DHP40.5.6.2 Other Bearings**

Where large pedestal type roller bearings are used to support slow moving parts the bearings shall be, where practicable, heavy duty self-aligning split roller bearings. Bearings shall have cast steel or fabricated steel housings or plumber blocks. Cast iron housings or plumber blocks shall not be used.

All high-speed shafts shall be provided with ball or roller bearings and they shall be mounted in dustproof housings and lubricated by grease gun.

Other bearings shall be of the adjustable cap type where practicable and shall be fitted with grease lubricators.

All cylindrical journal bearings shall be bushed with zinc-free bronze or white metal and shall be accurately bedded and grooved.

The underside of the base of each bearing shall be machined and shall bear against a machined surface.

#### **DHP40.5.7 Lubrication**

Lubrication shall be provided to all moving parts using either oil or grease. A separate oil cup or grease nipple shall be used to lubricate each point. Grease lubrication shall be provided with stainless steel button head type (1/8" BSP) grease nipples. A red circle of 60 mm diameter shall be painted around all grease nipples and oil filler caps or plugs for easy identification. Where necessary for accessibility, the nipples shall be placed at the end of a short extension pipe.

Where possible such nipples shall be grouped together and each group shall be mounted on a plate situated at a convenient point for the use of a grease gun which shall be provided under the Contract. A grease gun with connections to suit the nipples shall be provided with each unit of plant.

Before putting the equipment to work all grease points and gearboxes, etc., shall be charged as required with the appropriate lubricant.

Attention is drawn to the climatic conditions in Clause DHP40.5.1 and all oils and greases shall be suitable.

#### **DHP40.5.8 Access Ladders, Platforms and Handrails**

All access ladders, platforms, handrails, covers, etc., shall be in accordance with the Occupational Health and Safety Act, Act 85 of 1993 and the Drawings. Unless otherwise specified, the requirements of the following clauses shall apply.

##### **DHP40.5.8.1 General**

All ladders, platforms, cover plates, kerbings and appurtenant parts located at operating deck level or above shall be fabricated from 304L stainless steel.

All ladders, platforms, cover plates, kerbings and appurtenant parts located at the outside of civil structures and within two metres of the maximum water level, shall be manufactured from stainless steel 304L or better.

All safety cages around ladders shall, where practical, extend above the top end of the ladder for a distance of  $900 \pm 100$  mm.

##### **DHP40.5.8.2 Cat Ladders**

Where not shown and dimensioned on the Drawings, cat ladders shall be manufactured as follows:

- (a) The sides of the cat ladders shall consist of flats, the size depending on the length but in any case shall not be less than 70 mm x 12 mm, and the inside width shall not be less than 380 mm. The rungs shall consist of round bars, not less than 20 mm diameter at 250 mm centres holed through the side stringers, welded all around on both sides of the flats and ground flush on the outside. If it is not possible for any reason to adopt the rung centres stated above, the pitch adopted shall be not less than 230 mm and not more than 255 mm. The length of each ladder shall not exceed 7 m and shall be suitably supported over its whole length.
- (b) The cat ladders shall be vertical and provided with safety hoops of 700 mm diameter. The bottom safety hoops on each ladder shall be 2,50 m from the floor or landing level. The side stringers of all ladders shall be extended nominally one metre above the first rung to provide a handhold. Entries to the tops of cat ladders shall be suitably guarded by an entry bar.

#### DHP40.5.8.3 Platforms and Handrailing

Platforms shall be provided where applicable. All landing covers shall be of the egg-crate grating type. This grating shall be suitable for a floor loading of not less than 500 kg/m<sup>2</sup> and bar sections shall not be less than 39 mm x 3 mm and the platforms shall be designed accordingly. Kicking plates or angles shall be fixed around all platforms and shall extend 100 mm above the top of the flooring.

Handrails shall be provided along the exposed edges of all platforms and elsewhere as shown on the Drawings. All handrailing shall be three tiered tubular but the standards may be tubular or solid forged. Angle iron shall not be used.

Unless otherwise stated on the Drawings, the height to the top handrail from the finished platform or floor level shall be 1,10 m, the height to the top of the middle handrail shall be 550 mm and the height to the top of the bottom handrail shall be 225 mm. All handrails shall be equivalent in size and stiffness to BS 1775 Grade 13, 33,7 mm OD heavy-duty tube or equivalent standard.

#### DHP40.5.8.4 Cover Plates and Kerbings

All grating type covers shall be suitable for a floor loading of not less than 500 kg/m<sup>2</sup>. All raised tread non-slip type plate covers shall be of "Durbar" pattern and shall also be suitable for a floor loading of not less than 500 kg/m<sup>2</sup> but in any case shall not be less than 8 mm thick on the plain plate and shall be reinforced if and where necessary.

The covers and supports shall also be designed to take account of any special loadings that may be imposed during erection or maintenance. All heavy-duty covers shall be designed for HB loading.

The kerbings shall consist of rolled stainless steel angles suitably anchored and the landings for the covers shall not be less than 40 mm wide. Removable supports shall be provided where necessary.

#### DHP40.5.9 Nameplates, Rating Plates and Labels

##### DHP40.5.9.1 General

Where appropriate each item of Plant shall have permanently attached to it in a conspicuous position a nameplate upon which shall be engraved or stamped the manufacturer's name, type and serial number of Plant, Contract No., Order no., date of manufacture, mass, material and all necessary information relating to the supply and replacement of parts and details of the loading and duty at which the item of Plant has been designed to operate. A nameplate denoting the Plant or function identification number shall also be attached. Such nameplates shall be of stainless steel.

Labels shall be provided for every panel to describe the duty of or otherwise identify every instrument, relay or item of control equipment mounted externally and internally.

Outdoor fitted panel labels shall be of non-plastic, durable, weather resistant material with letters and numbers engraved and filled with black.

Indoor fitted panel labels shall be finished white and engraved letters and numbers filled with black paint, unless otherwise specified. Laminated material such as "Trifoliate" or rear engraved and filled plastic may be used. Embossed materials and techniques shall not be accepted.



Labels shall also be provided in conformity with the above requirements or by other approved means wherever necessary to designate panels or panel sections, to provide warnings or reminders of dangerous or potentially dangerous circumstances and wherever called for elsewhere in this Specification.

Danger labels, e.g. "DANGER-380V AC" shall be coloured red with white lettering.

Caution labels e.g. "CAUTION: ISOLATE BEFORE REMOVING COVER" shall be white with red lettering.

Where withdrawable equipment is provided, both fixed and moving portions shall be suitably identified.

Labels shall be of uniform design and the display of manufacturers' standard nameplates on panel external surfaces shall be subject to the approval of the Engineer.

Details of proposed inscriptions shall be submitted to the Engineer for approval before any labels are manufactured.

All nameplates and labels shall be fixed using non-corrosive fasteners (e.g. screws with nuts and washers or power nails) to the approval of the Engineer. Mounting by adhesive only shall not be acceptable.

#### **DHP40.5.10 Additional Electrical Requirements**

All cabling systems shall be neatly routed and enclosed in non-corrodible ducts or cable trays with securely fixed covers.

Brackets, fasteners and cable tie-down straps shall also be of non-corrosive materials. Cable tie-down straps on outdoor installations shall be of stainless steel. Plastic type cable ties, ducting and trunking shall not be acceptable.

All electrical junction boxes shall be of metal. Plastic type electrical junction boxes shall not be acceptable.

All cable connections shall be protected in accordance with IP 65 of SANS 60529, supported and sealed by means of a stainless steel gland. The armouring shall be clamped between substantial tapered sections that form an integral part of the gland. A suitably sized rubber shroud shall be installed over all glands.

Cables shall as far as possible enter connection boxes at the bottom.

Any unused openings in electrical cabinets shall be plugged to prevent the ingress of vermin. These shall however be kept to the minimum.

#### **DHP40.5.11 Corrosion protection**

##### **DHP40.5.11.1 Design Precautions**

All Plant shall be designed to suppress corrosion in an exposed environment.

##### **(a) Accessibility**

Easy access for protection and maintenance shall be provided. The use of back to back angles, partially open box sections or inaccessible stiffeners shall be avoided.

Corrosion protection of areas that are unavoidably inaccessible shall be specified by the Engineer.

##### **(b) Water-Retention Areas**

Pockets, recesses and crevices in which water and dirt may collect shall be avoided. Water retention areas shall be properly drained by holes as large as possible i.e. 150 mm diameter but minimum 50 mm diameter.

Surfaces of corrodible metals, such as the insides of tanks or hollow sections that cannot be protected by any method (e.g. painting or dipping), shall be avoided, or where not possible, be fully sealed against ingress of air and moisture.

(c) Permanent Installations

Permanent installations in concrete shall be manufactured from stainless steel as specified in Clause DHP40.3.3.2.

DHP40.5.11.2 Corrosion Prevention

The Contractor shall ensure that the following steps are taken to minimise corrosion:

- (a) If dissimilar metals are used: Coat all surfaces of the whole assembly including the more noble member of the galvanic series.
- (b) If the noble member of the assembly cannot be entirely covered:
  - (i) Keep the anode/cathode ratio as large as possible in the particular component.
  - (ii) Use electrical insulators between two metals. Insulation shall be complete; a bolt requires a sleeve as well as washers of an insulating material.
- (c) Joints and crevices between metals shall be sealed.
- (d) Where fastening is unavoidable, the fasteners shall be more noble (cathodic) than the base material. Fasteners shall be coated where possible and / or adequately electrically insulated between fasteners and the base material.

DHP40.5.11.3 Manufacture and Pre-preparation

(a) Responsibility

(i) Pre-Preparation

The Manufacturer or Refurbisher shall be responsible for all the pre-preparation of equipment prior to surface preparation. Pre-preparation shall be carried out to the approval of the Engineer and the Corrosion Protection Subcontractor.

(ii) Personnel

Pre-preparation shall be carried out by competent personnel, under the supervision of an experienced supervisor.

(iii) Marking

All items shall be permanently and indelibly marked to identify each individual item as specified by the Engineer.

(b) Fabrication Requirements

(i) Surface Defects

All extrusions, rolled steel and castings shall be clean and free of score marks, pits, protrusions, blisters, porosity, blowholes, cracks or any other flaws that may be detrimental.

Laminations, scabs or occluded scale shall be ground out. If such grinding penetrates deeper than 7 % of the metal thickness, the area shall be repaired by welding or the metal shall be rejected at the discretion of the Engineer.

(ii) Undercuts, Cavities and Pits

Weld undercuts and cavities as well as pits in metal surfaces are not permitted.



All undercuts, cavities and pits shall be ground out, re-welded and ground to a smooth contour.

(iii) Welds

All welds shall be continuous and shall have a smooth contour.

Staggered welds, where specified, shall only be permitted with prior approval of the Engineer on submission of appropriate remedial corrosion protection procedures.

Welding processes used shall limit heat input to a minimum to restrict the heat affected zone.

(iv) Lifting Lugs

Where required, lugs shall be fitted by the manufacturer to the requirements of the Corrosion Subcontractor and the approval of the Engineer.

(v) Lugs to Be Removed

After removal of lugs, the damaged coating area shall be repaired in accordance with the Specification.

(vi) Permanent Lugs

Lugs, not intended to be removed, shall be manufactured of equal or more noble grade than the base material in accordance with the Specification. Where possible, stainless steel shall be used.

#### DHP40.5.11.4 Pre-preparation

(a) General Requirements

(i) Protrusions

Protrusions shall be removed by grinding and dressing to a smooth contour.

(ii) Sharp Edges

Burrs and rough faces caused by guillotining, flame cutting, drilling, machining or punching shall be removed by grinding.

All sharp edges shall be radiused to a minimum of 2 mm.

(iii) Welds

Welds shall be free from slag, slag inclusions, cracks, surface cavities and under-cuts.

Irregular projections shall be ground to a smooth contour.

Areas adjacent to welds shall be free from weld spatter. Such spatter shall be removed by grinding or scraping.

(b) Materials

(i) Castings

Castings with defects exceeding the restrictions given in the table below shall be rejected.

In the case of blowholes occurring opposite each other, the combined depth shall be taken into account.

Blowholes and cavities not exceeding 2 mm in depth shall be smoothed out by grinding.

**Table DHP40.2 : Acceptance criteria for the repair of blowholes and cavities**

SURFACE	DEPTH OF BLOWHOLES	DIAMETER OF BLOWHOLES	REPAIR
Internal	Maximum 20 % of material thickness	40 % maximum of material thickness	Welding only
External	Maximum 10 % of material thickness	20 % maximum of material thickness	Solvent free Epoxy or welding
External	10 to 20 % maximum of material thickness	40 % maximum of material thickness	Welding only

- Castings shall, after inspection by the Engineer, be ground smooth.
- Small and repaired blowholes shall be ground level and smooth.

(ii) Hot-Dip Galvanized Items

The design and manufacture of all items to be hot-dip galvanized shall conform to SANS 10214.

Vent holes shall be drilled by the Manufacturer, in accordance with the above Code of Practice, to the approval of the Engineer and Galvanizer.

The Silicon and Phosphorus contents of materials to be galvanized shall comply with the standard below. If no material certificates are available, samples of the materials shall be analysed for their Silicon and Phosphorus contents.

The following materials shall be used:

- For aesthetic appearance:
  - o Aluminium-killed steel or
  - o Silicon-killed steel with a Silicon content not exceeding 0.04% and a Phosphorus content not exceeding 0.02%.
- For general corrosion protection:
  - o Aluminium killed steel or
  - o Silicon killed steel with a Silicon content not exceeding 0.25% and a Phosphorus content not exceeding 0.02%.

NOTE: Material certificates to verify the above requirements shall be provided by the Contractor.

(iii) Corrosion Resistant Steels

Fabrication shall take place in dedicated areas separated from carbon steel.

All equipment used in the forming and manipulation of stainless steel items during fabrication shall be clean and free of materials that may contaminate the metal with carbon steel.

The manufacture of items from corrosion resistant steels shall be in accordance with the SASSDA's Information Series and the guidelines of the material supplier.

Discoloration caused by welding or cutting shall be mechanically cleaned by buffing followed by pickling and passivation in accordance with the SASSDA's Information Series and the guidelines of the material supplier.

Organic contamination shall be removed by degreasing.

Iron contamination shall be removed by pickling and passivation, by the dipping process, after degreasing.

All surfaces shall be tested for free iron contamination by the water or the ferroxyl test method.

#### DHP40.5.11.5 Primary Cleaning

The Manufacturer or Refurbisher shall remove excessive oil, grease or other surface contaminants with a water soluble solvent degreaser followed by rinsing with clean soft water before the items are despatched to the Corrosion Protection Subcontractor.

#### DHP40.5.12 Operating & Maintenance Manuals

- (a) The Contractor shall provide 7 complete hard copies and one complete electronic version on CD or DVD or other medium agreed upon of an Instruction Manual in the English language as approved by the Engineer.
- (b) The manuals shall be securely bound in A4 size hard backed plastic waterproof four ring binders with clear pockets on the spine and front cover for insertion of title slips giving Contract number, Project and Plant supplied.
- (c) The manual shall contain sections separated by plastic dividers clearly and visibly marked to match the index and shall be set out as follows:
  - (i) Title Page;
  - (ii) Contents;
  - (iii) Tender Specification, completed Tender forms, covering letters and final inspection certificate;
  - (iv) General Description with hydraulic test certificate and final acceptance certificate relating to tests carried out;
  - (v) Pre-Tests on Completion checks;
  - (vi) Operating instructions;
  - (vii) Operating limitations or constraints (if any);
  - (viii) Routine maintenance and lubrication schedules;
  - (ix) List of special maintenance tests provided, or required;
  - (x) Planned maintenance and repair procedures;
  - (xi) Fault diagnosis;
  - (xii) Spare parts lists: suppliers/agents details shall be provided; and
  - (xiii) Drawings: They shall include general arrangement, assembly drawings, parts and material lists and flow discharge curves, where applicable, in A3 size. Any supplier's original brochures and instrumental literature shall also be incorporated in the manual; such literature shall be edited so as to clearly indicate the sections specifically applicable to the materials or Plant actually incorporated into the Works.
- (d) Drawings larger than A3 size, index and other title pages shall be contained in separate pockets.
- (e) Where it is not possible to include all items of a particular section of the Plant in one binder, several binders as necessary shall be provided and all binders for that section of the Plant shall

bear the same volume number, but with the sections contained therein clearly defined on the front cover and spine.

- (f) A collection of manufacturer's descriptive leaflets, instruction sheets, charts, lists, pamphlets and the like shall not be acceptable in place of the Instruction Manual, though they shall be provided as complementary thereto.
- (g) As soon as he is able to do so, and in any case not later than the time at which any item of the Plant is delivered to the Site, the Contractor shall submit for the Engineer's approval, a set of instructions appropriate to the erecting, Tests on Completion, testing, operation and running maintenance of that item. These instructions shall take the form of a draft of the relevant part of the Instruction Manual.

#### **DHP40.5.13 Safety**

All Plant shall comply with the OHS Act (No 85 of 1993).

All shafts, couplings, collars, projecting key heads, gear wheels, chain drives and other moving machinery shall be guarded to give complete protection to all persons. All setscrews on revolving shafts shall be countersunk or suitably protected. The guards shall be of approved design and shall be fitted where necessary with inspection doors. All guards shall be arranged so that they can be removed without disturbing the parts of the gears and plant they protect. The guards shall comply with the requirements of BS 1649 or equivalent standard.

Any permanent fencing or other safeguards required to be erected around electrical Plant shall be completed as far as practicable before connection is made to the electricity supply, but where this is not practicable, the Engineer may permit the use of temporary fencing or other safeguards.

If work in the vicinity of electrical Plant has to be carried out after connection has been made to the electricity supply, the Contractor shall comply with any "Permit to Work" system approved by the Engineer.

All equipment shall be designed and arranged to minimise the risk of fire and any damage that might be caused in the event of fire.

No protruding items of a permanent nature shall be allowed on the deck or any other moving or working area.

#### **DHP40.5.14 Spare Parts**

The Contractor shall supply such spare parts for the operation of the Plant for a minimum period of 5 years or as the Engineer shall direct, at rates entered in the Spare Parts Price List or Bill of Quantities.

In the case of parts which are required to be regularly replaced during the lifetime of the plant or equipment, the Department requires that certain minimum facilities be available in the Republic of South Africa for the supply of these parts. Tenderers shall state in their covering letter what facilities will be provided for the supply of these parts. The information shall include the name and address of depots where the parts will be held.

The Department requires certain minimum facilities to be available in the Republic of South Africa for the repair of any breakdowns which may occur in any portion of the plant or equipment to be supplied under the Contract. Tenderers shall state in their covering letter details of the facilities and service they could provide. In the light of the above, the Department expects adequate services to be forthcoming throughout the life of the plant or equipment supplied.

All spare parts shall be new, unused and strictly interchangeable with the parts for which they are intended to be replacements. All such spare parts shall be treated and packed for long storage under the climatic conditions prevailing at the Site.

Each spare part shall be clearly marked or labelled on the outside of its packing with its description and purpose, and when more than one spare is packed in a single case or other container, a general description of its contents shall be shown on the outside of such case or container in a waterproof transparent envelope and a detailed list enclosed.



All cases, containers and other packages shall be marked and numbered in an approved manner for purposes of identification.

All spare parts shall be inspected by the Engineer prior to packing.

#### **DHP40.5.15 Special Tools and Test Equipment**

The Contractor shall supply all special tools and test equipment for the Engineer's approval to enable any erection, dismantling, reassembly or testing to be carried out on all parts of the Plant, whether of an electrical, mechanical or other nature during the life of the Works.

The tools and test equipment shall not be used for erection and, except that the Engineer may call upon the Contractor to demonstrate their use and effectiveness, they shall be handed over to the Employer in a completely new and unused condition. Should the Contractor require any such tools and test equipment at the Site during erection, he shall provide his own.

The tools for each different type of equipment shall be contained in suitable boxes clearly marked or labelled with their description. Each tool shall be identified and a list of tools stamped on a stainless steel plate shall be affixed to the inside of the box lid. Boxing shall be deemed to be included in the rates entered for the tools. Each set of tools shall be supplied with the equipment with which it is associated.

The test equipment shall include only special purpose items essential for the testing or repair.

#### **DHP40.5.16 Packing and Transportation**

Before any of the Plant is despatched from a manufacturer's works, it shall be properly prepared and packed and the Contractor shall give the Engineer at least 14 days notice that these preparations are to commence.

Prior to despatch all parts shall be adequately protected by painting or by other means for the whole period of transit, storage and erection, against corrosion and incidental damage, including the effects of vermin, sunlight, rain, temperature, wind blown sand and humid atmospheres. The Contractor shall be responsible for the Plant being so packed and/or protected as to ensure that it reaches the Site intact and undamaged. The Plant shall be packed to withstand rough handling in transit and all packages shall be suitable for storage including possible delays in transit.

The Contractor shall be deemed to have included in the Bill of Quantities for all materials and packing cases necessary for the safe packing and transport of the Plant. All transporting arrangements shall be to the satisfaction of the Engineer.

No one package or bundle shall contain items intended for incorporation in more than one section of the Works. Cases containing small items shall not weigh more than 500 kg gross.

Bolts in strong hessian bags and other small components shall be labelled and crated. The bags and crates shall be tagged using metallic tags and shall indicate the following information:

- Contract number;
- Project name;
- Part numbers;
- Description;
- Sizes; and
- Quantities.

Each bag or crate shall have the delivery address listed on a separate metallic tag.

Every crate or package shall have a general description of its contents shown on a packing list in a waterproof transparent envelope attached to the outside of the crate or package. The Delivery Certificate Form ME 2, included in this Specification, shall be used for this purpose. A duplicate copy of the packing list shall be issued to the Engineer. The Department shall not accept any responsibility for items not listed on the Consignment Notes.

All items shall be clearly marked for identification against the packing list.



All crates, packages, steel fabrications and machinery shall be clearly marked with a waterproof material to show the weight, the position to which slings may be attached and shall have an indelible identification mark relating them to the packing lists. In addition, all packages shall be clearly painted with a distinctive site identification colour and sign, so that the final location of each item can be easily identified at the Site in order to avoid delay, double handling or loss. These special identification marks shall be in addition to the normal shipping and transport marks.

Machined flanges of pipes, valves and fittings shall be protected by wooden discs attached by means of service bolts (which shall not be used on the Works) or by other approved means.

Coated items shall not be handled within the drying time recommended by the coating manufacturer, relevant to the ambient temperature. Wherever possible lifting of painted items shall be from approved lifting attachments. All coated items shall only be lifted by means of broad band slings that shall not damage the coating. Slings shall not be less than 50 mm wide or as approved by the Engineer.

During transport, non-packaged items shall be held securely in position on sufficient padded blocks as are necessary to give adequate and safe support and, inter-alia, to militate against the possibility of brinelling of bearings en route to Site.

The use of ropes, wire ropes or chains without suitable padding is expressly forbidden.

All the necessary bunks of timber or sawdust bags to support the components on soil, concrete or other hard surface and to separate them from each other in transit and at Site shall be provided by the Contractor free of charge.

When loading onto vehicles, precautions shall be taken to support and chock the components to prevent movement. Components shall be firmly lashed or chained with padded lashing, supported on sawdust bags. The area of padded surfaces shall be adequate to prevent damage to the coating.

Items may be inspected on arrival at the Contractor's end delivery point and any repairs necessary shall be to the cost of the Contractor. Any damage that occurs during the handling and storage of Plant and components at the Manufacturer/Contractor's works, including transportation to Site, shall be repaired by the Manufacturer/Contractor at his own cost, in accordance with the Specification and to the approval of the Engineer. Damage to corrosion protection shall only be carried out by a corrosion protection applicator.

#### DHP40.5.16.1 Off-Loading at Site

The Engineer shall be notified within 21 days of the delivery date and of any requirements regarding off-loading and storage at Site.

The supplier shall be responsible for the transportation and supervision during off-loading of the equipment and other small components at the delivery Site.

Under no circumstances shall coated equipment be allowed to rest directly on the ground.

The final delivery inspection and acceptance of equipment supplied shall be undertaken on Site after off-loading has been completed.

The Engineer has the right to reject any damaged equipment, components and materials that have been delivered and off-loaded at Site.

#### DHP40.5.16.2 Stacking and Storage

The Contractor shall provide all the necessary bunks of timber and sawdust bags used to support the equipment and components on soil, concrete or other hard surface and to separate them from each other, both at his Works and on Site.

Grass or other vegetation shall not be allowed to grow in the storage area within three metres of the Plant and components.

Stacking of equipment on top of each other shall not be allowed if this leads to any deformation of equipment.

### DHP40.5.16.3 Attachments for Transport and Erection

The Contractor shall submit for the Engineer's approval proposals for such properly designed supports, lifting attachments or handling points as the Contractor considers necessary or desirable for assistance in handling fabricated sections for cleaning, applying protection, assembly, transportation, storage, erection and subsequent maintenance. All such lifting attachments or handling points shall be such as to avoid overstressing or deforming the steel members of fabrications. Lifting attachments shall be designed for not less than the applicable mass reaction plus 50 % allowance for impact.

Temporary supports, lifting attachments or handling points shall be removed or filled in as required, and by approved methods to the satisfaction of the Engineer, and the surfaces of the permanent steelwork in these localities shall be dressed, cleaned and painted as specified elsewhere. Where tapped holes are provided for lifting devices (such as eyebolts) the tapped holes shall be plugged with stainless steel socket head screws (the thread of which shall be covered with anti-seize compound).

Supports, lifting attachments or handling points may be left, if so approved by the Engineer, provided that in his opinion:

- (a) There is no deleterious long term effect on the structural integrity or operational use of the completed fabrication.
- (b) The steelwork protective system is continuous over or around the lifting attachments or handling points and there is no undue risk of breaks or cracks occurring in the protection at such areas.
- (c) There is no significant effect on the visual appearance of the fabrication.

Attachments to the steel fabrication to assist in the future inspection and maintenance of the steelwork and associated equipment may be required. Such attachments (e.g. supports for ladders, scaffolding cradles and ropes) may be combined with the Contractor's temporary handling and lifting requirements during fabrication and erection and agreement on additional attachments shall be subject to the approval of the Engineer before fabrication of the steelwork is commenced.

### DHP40.5.17 Erection and Setting to Work

#### DHP40.5.17.1 General

The Contractor's Representative and workmen referred to in the Conditions of Contract shall include approved specialist skilled working erectors and sufficient skilled, semi-skilled and unskilled labour to ensure completion of the Works in the time required. The Contractor shall not remove any supervisory staff or skilled labour from the Site without the Engineer's prior approval.

The Contractor's erection staff shall arrive at the Site on dates to be agreed by the Engineer. Before they proceed to the Site the Contractor shall satisfy himself that sufficient items have arrived on Site so that no delay will be incurred on this account.

The Contractor shall be responsible for setting up and erecting the Plant to the line and level required and shall ensure that, where items are to be built-in they are kept in position whilst being built-in.

Where a specialist Subcontractor is in attendance during the building in of first-stage built-in parts the sums and rates entered in the Bill of Quantities shall be deemed to include for all Site visits made for this purpose.

#### DHP40.5.17.2 Foundations, Foundation Bolts and Fittings

Foundations, where required, shall be provided by the Contractor for the erection of the Plant and shall comply with any requirements of specialist Subcontractors and with any Drawings supplied by them and approved by the Engineer. Where necessary, the Contractor shall prepare floors and plinths to accept foundation bolts or mounting channels to the approval of the Engineer.

The Contractor shall supply all holding down, alignment and levelling bolts complete with anchorages, nuts, washers and packing required to attach the items of Plant to their foundations, and all bed-plates,

frames and other structural parts necessary to spread the loads transmitted by the Plant to concrete foundations without exceeding the design stresses.

All bed plates and machinery shall be connected to concrete by means of grout arranged so as to transmit all vertical and horizontal loads into the foundations by means of direct compressive stress.

The bed plates and machinery shall be provided with means of adjustment for line and level to maintain the items of Plant in correct alignment during grouting. Packers used for adjustment shall be of non-corrosive material to the approval of the Engineer.

Holding down bolts that are to be tightened after grouting shall be provided with bond breakers where they pass through grout.

Unless otherwise specified, holding down bolts, nuts and washers shall be of stainless steel and provided with isolating washers and sleeves where appropriate to prevent galvanic corrosion.

#### DHP40.5.17.3 Accuracy of Work: Mechanical Plant

The Contractor responsible for installation of the mechanical plant shall be responsible for alignment of any plant according to the designer's / manufacturer's specification.

The Contractor responsible for installation of the mechanical plant shall also be responsible for supporting the plant or equipment prior to final installation in order to achieve the required accuracy of installation.

Conformance to these tolerances shall be verified by the Engineer and no installation work shall continue before written approval from the Engineer has been received.

#### DHP40.5.17.4 Grouting

Concrete for embedding second stage built-in parts shall be supplied, mixed and placed in accordance with specified requirements as approved by the Engineer.

Grout for the connection between bed plates and machinery and concrete shall be non-shrink epoxy grout and shall be mixed and placed in accordance with the approved Drawings.

Non-shrink grout shall:-

- (a) Have a compressive strength not less than 4 times the maximum stress to be transmitted;
- (b) Be subject only to compressive stress;
- (c) Be such that air voids are eliminated between bed plates and machinery and concrete;
- (d) Be completely resistant to lubricants, hydraulic fluids and diesel fuel;
- (e) Have a bond strength to concrete exceeding the tensile strength of the concrete; and
- (f) Have a bond strength to steel not less than (e) above.

Cavity and contact grouting behind the bell mouth intake linings shall be done, following precise alignment to line, plane and level. When the grouting is complete the Contractor shall fill all grout holes in the lining with screwed and welded steel plugs to give a flush surface on the inside of the lining.

#### DHP40.5.17.5 Building In

The provision of trenches, backfilling and reinstating holes through walls and floors, chases or ducts in walls and floors, making good and final decorative finishes shall be undertaken by the Contractor. For this purpose the Contractor shall make all necessary arrangements with his specialist workmen who shall mark out all such work and shall provide all necessary information concerning preformed holes, chases, ducts, etc. The Contractor shall be responsible for the accuracy of all building in operations.



**DHP40.5.17.6 Drilling the Structure for Fixings**

The drilling of holes for fixing devices shall be carried out by specialist workmen. Holes shall be made with a rotary drill, or a rotary/percussion type drill such that no damage or spalling is caused to the concrete and/or brickwork being drilled. Explosion or impact devices, such as single shot cartridge tools, shall not be used.

No structural steel, reinforcement or timber work shall be drilled without the prior approval of the Engineer.

Any damage to surfaces caused by the Contractor or his specialist during erection shall be made good by the Contractor without additional payment and to the satisfaction of the Engineer.

**DHP40.5.17.7 Instrument Installation**

All measuring instruments shall be installed in accordance with the recommendations or instructions of the instrument manufacturer, for the particular application. Each mounting position shall be chosen to give correct operation of the equipment, faithful reproduction of the quantity to be measured, ease of operation, reading, maintenance and servicing, and freedom from any condition that could have adverse effects.

**DHP40.5.17.8 Protection on Site**

Factory finished parts shall be adequately protected during installation against damage to finished surfaces and fitted components. It may be necessary for structural finishing operations to be carried out in the vicinity of installed items of Plant before it is taken over and the Contractor shall take this into consideration in complying with the requirements of this clause.

**DHP40.5.17.9 Setting to Work**

After the Plant has been erected and the tests specified have been carried out, the Contractor shall set the Plant to work and when the Contractor is satisfied that the Plant is working correctly he shall inform the Engineer that he is ready for the Tests on Completion.

**DHP40.5.17.10 Period of Instruction**

The Contractor shall allow for a "period of instruction" of 2 weeks duration during which time the Contractor shall provide for 40 hours each week such skilled operators as are necessary to instruct the Employer's own operators to operate and maintain the Plant. Verbal instructions relating to operating procedures additional to any instructions given in the instruction manuals shall be confirmed in writing.

**DHP40.5.17.11 Periodic Visits**

The installation shall be visited during the sixth and twelfth months after the commencement of the Defects Notification Period in the company of the Engineer by a competent engineer and/or other specialist representative of the Contractor who shall inspect all the Plant provided under the Contract and service, adjust and recalibrate as necessary all items requiring attention.

**DHP40.6 TOLERANCES**

Tolerances and accuracy of work shall be as specified in Clause DHP40.5.17.3 and Clause 6 of the applicable Particular Specification DHP41 to DHP47.

**DHP40.7 QUALITY CONTROL AND TESTING****DHP40.7.1 General**

The Contractor's Quality Management System shall be in accordance with ISO 9000.

The Contractor shall implement a comprehensive Quality Control programme and accept full responsibility for the quality of his workmanship and material used, irrespective of any quality surveillance that may be carried out by the Engineer or his appointed representative.

In keeping with the principles contained in the above mentioned code of practice, the Contractor or Subcontractor(s) shall -

- Be responsible for compliance with all the clauses of this Specification in every respect;
- Carry out all inspections and tests called for in the Specification in the presence of the Engineer or his appointed representative. The cost of these inspections and tests shall be included in the Tender Price; and
- Submit a quality control plan for approval by the Engineer for manufacture and comply with the specified quality plan for corrosion protection of all components indicating all the intended stages of testing during manufacture, cleaning, preparation and application as well as hold points for independent quality surveillance.

The quality control plans shall not be compromised once in agreement and shall be adhered to at all times.

The Contractor shall operate approved quality assurance and control programmes on the Supplier's and Manufacturer's premises and on Site in order to verify that the Works comply with this Specification. Prior to the commencement of any work, the Contractor shall prepare and submit to the Engineer for approval, quality plans describing the procedures, standards of acceptance, hold point inspections, routine and type tests to be carried out for each component both during manufacture and on Site.

Although it shall remain the responsibility of the Contractor to ensure that the Works conform to the Specification, the Engineer shall be entitled to inspect, examine and test the materials, workmanship and performance of every item of Plant. The Engineer will notify the Contractor which tests or inspections, detailed in the quality plan, he will attend.

The Contractor shall give the Engineer not less than 14 days notice in writing of the date and the place of impending inspections or when cleaning and first coat application are to be carried out as well as for witnessing the points in terms of the agreed Quality Control Plans and he shall give the Engineer full facilities for witnessing such tests.

Approval by the Engineer of materials, workmanship etc., during manufacture or at Site shall not relieve the Contractor of his obligations to comply with all the requirements of the Contract.

All instruments and appliances necessary for the complete inspection and testing shall be provided by the Contractor. Calibration certificates for instruments shall be produced for the Engineers approval and, if required by the Engineer, instruments shall be re-calibrated before commencement of the tests and again immediately after the tests.

#### **DHP40.7.2 Contractor Qualification**

The Contractor and Subcontractor(s) shall satisfy the Engineer that they have the management, facilities and equipment, skilled staff, a quality control procedure and required test methods and standards to carry out quality control during manufacture and corrosion protection.

The above-mentioned Contractors' shall be subject to a Quality Audit.

#### **DHP40.7.3 Inspection at Manufacturer's Premises**

All Plant shall be subject to inspection and testing by the Engineer at the Manufacturer's premises before despatch. No material shall be delivered to the Site without inspection having being carried out or waived by the Engineer in writing.

#### **DHP40.7.4 Inspection by the Engineer**

Inspection of equipment shall be carried out by the Engineer, his appointed representative or a nominated and approved inspection authority at the Manufacturer's and Corrosion Applicator's works.



#### **DHP40.7.5 Independent Surveillance**

The Engineer may employ an independent, technically qualified organisation to carry out quality surveillance of the work on his behalf.

The inspection authority has the right to inspect any item covered in the Contract at any stage of execution of the Contract.

Where imported supplies are to be inspected before shipment, the Contractor shall notify his suppliers abroad of the conditions applicable to inspections and also request them to notify the Employer's Representative abroad when consignments are ready so that arrangements for inspection may be made.

##### **DHP40.7.5.1 Material Tests**

The Manufacturer's material test data certification and the Contractor's quality records shall be subject to examination by the Engineer or his representative. Reasonable samples of the cleaning and coating materials to be used may be removed for testing.

Rejection of the samples shall place a hold on the use of materials of the same batch number and any components that have already been cleaned/coated with rejected material shall be reworked.

##### **DHP40.7.5.2 Type Tests**

Where the Contractor offers equipment selected from the standard range of products from a specialist manufacturer, type tests in accordance with a recognised international standard are required on one unit of each type to prove satisfactory design and quality of manufacture.

The Engineer may waive the requirement for type tests if he is satisfied that tests have previously been performed on identical equipment. The Contractor shall submit the data and results with his Quality Plan in sufficient time to allow for repeat tests without delaying the Works should the Engineer not approve the evidence submitted.

##### **DHP40.7.5.3 Routine Tests**

The Contractor shall carry out routine tests in accordance with the requirements of recognised applicable standards on all items of Plant during manufacture to demonstrate satisfactory materials, workmanship and assembly.

Detailed proposals for routine tests shall be included in the Contractor's Quality Plan, and shall include where applicable :

- Material tests
- Non-destructive tests
- Dimension and finish checks
- Pressure tests
- Assembly checks
- Paintwork tests
- Electrical tests
- Functional tests
- Load tests
- Performance tests

After assembly each unit shall be carefully checked to ensure that it is in accordance with the approved dimensions.

Each section of the work such as (where applicable) the isolating gate reception frames and guides, radial gate bearing trunnions and sealing frames, etc., shall be assembled as is necessary in position so that the Engineer can adequately test and check that all parts are to the correct dimensions, square and that all moving parts work easily.

Welds shall be physically examined and non-destructively tested by radiographic, ultrasonic, magnetic particle or dye penetrant methods as appropriate and / or specified.

#### DHP40.7.5.4 Tests at Site

The Contractor shall repeat such routine tests as are necessary to confirm that the Plant has not been damaged in transit, has been satisfactorily erected, and is ready for Tests on Completion.

For the purpose of carrying out tests on the Plant at the Site (including Tests on Completion), all labour, materials, power, apparatus and ancillary equipment as may be requisite for the tests shall be provided by the Contractor.

The Engineer shall not be obliged to witness dry tests or Tests on Completion unless Operating and Maintenance Manuals have been presented and approved as being in a sufficiently advanced state of completion as is appropriate for the type of testing that it is proposed be carried out. The Engineer may order that tests, which had to be aborted because of major malfunctions of Plant or equipment, be repeated in their entirety once the malfunctions have been corrected.

#### DHP40.7.5.5 Destructive Testing

The Engineer or his representative may carry out reasonable destructive tests to ascertain compliance with the Specification. Areas thus damaged shall be repaired by the Contractor to the satisfaction of the Engineer at no additional cost.

#### DHP40.7.5.6 Non-destructive Testing During Manufacture

All welds on Plant shall be physically checked for compliance with the Specification and for throat thickness in the case of fillet welds. If judged to be satisfactory from a physical external examination, they shall then be non-destructively tested by means of radiographic, ultrasonic, magnetic particle or dye penetrant methods, as appropriate. If post weld heat treatment is required, non-destructive tests shall be done after completion of heat treatment. Prior approval for the use of ultrasonic (or other) methods in place of radiographic methods shall be obtained from the Engineer by way of the approval of welding procedure submissions.

Radiographic examination shall be in accordance with BS 2600 : Parts 1 or 2, or BS 2910 as appropriate. Normally X-ray techniques shall be used with ultra-fine-grain-high-contrast direct-type film.

The standards of acceptance shall be as defined in BS 5500 Table 5.7 Acceptance Levels. Unacceptable defects shall be rejected or repaired as directed by the Engineer.

If welds or portions of a weld or welds are deemed to be of an unacceptable standard of quality, total repair or re-welding shall be carried out as directed by the Engineer. No repair shall be carried out after the radiographic examination without the prior approval of the Engineer.

If the re-radiographing of a repaired weld reveals unacceptable defects then the whole weld shall be cut out, rewelded and re-tested.

All repairs shall, if practicable, be carried out by the same process as was used for the original weld. An alternative process for repair may only be used with the full knowledge and approval of the Engineer.

Where the defective part has been cut out, the Engineer shall be entitled to make an examination before re-welding is commenced.

Repaired sections of welds shall be re-subjected to radiographic examination and radiographs shall be identified as being carried out after the repair.

The Contractor shall supply all apparatus, materials and labour required for his own non-destructive examinations and for non-destructive examinations ordered by the Engineer.

#### DHP40.7.5.7 Non-destructive Testing on Site

In addition to the requirements of Clause DHP40.7.5.7, should any site welding be necessary, ultrasonic examination of in-situ welds may be ordered for welds where radiographic examination is not practicable.

Prior approval for the use of ultrasonic (or other) methods in place of radiographic methods shall be obtained from the Engineer by way of the approval of welding procedure submissions.

Ultrasonic examination shall be in accordance with BS 3923 : Parts 1 or 2 as appropriate. Adjacent parent metal shall be ultrasonically examined to locate any imperfections that might prevent effective examination of the weld.

#### **DHP40.7.6 Quality Control Records**

##### **DHP40.7.6.1 Coating and Material Records**

Quality control, material and coating records for all stages of the work, i.e. batch numbers of materials used, environmental conditions and all test data shall be recorded on the approved Quality Control Plan for manufacture and the approved Quality Control Plan for corrosion protection.

Certificates for all materials used shall also be required.

##### **DHP40.7.6.2 Data Sheets, Specifications and Codes of Practice**

The Contractor shall have available the latest issues of the following:

- (a) A copy of this Specification.
- (b) Relevant Standard Specifications and Codes of Practice.
- (c) Manufacturer's data sheets for materials to be used.

The above mentioned shall be available to all the Contractor's Quality Control and Production personnel.

##### **DHP40.7.6.3 Quality Control Records**

Accurate and detailed quality control records shall be kept by the Contractor for all stages of the work.

Data of corrosion protection shall be recorded on the Employer Record sheets (see Departmental Specification DWS 9900) for corrosion protection:

- (a) Quality Control Plan
- (b) Coating Application Records
- (c) Surface Profile and Dry Film Thickness readings

All the quality control records shall be available for inspection by the Engineer or his representative.

Incomplete, inaccurate or inadequate records shall be regarded as non-compliance with the Specification.

The collection of documents for each item of Plant shall be collated and bound in a logical manner and retained by the Contractor as proof of quality achieved. These shall be available on demand for quality control and part payment releases. The records shall be handed over to the Engineer on completion of the work.

The records shall be bound in the Operation and Maintenance manuals where such manuals are supplied.

##### **DHP40.7.6.4 Provision for Testing**

The Contractor shall at no additional cost provide all material, samples, labour and the necessary calibrated instruments that may be required for the purpose of inspection, testing and analyses, unless otherwise specified.

**DHP40.7.7 Substandard Quality Control**

All material, certification and records of the Contractor shall be subject to examination by the Engineer.

This shall include the checking and testing of the Plant. If any deviation is found, additional testing and quality surveillance shall be carried out.

If the additional testing confirms inaccurate quality control by the Contractor, all work shall be stopped and shall only proceed after remedial action has been implemented.

**DHP40.7.8 Access for Surveillance**

For the purpose of carrying out quality surveillance, the Engineer or his representative shall be granted access to any part of the Contractor's premises relevant to the work being carried out, at any reasonable time.

The Contractor shall provide, at his own cost, any equipment or labour necessary to gain access to surfaces which are coated, to be coated or are in the process of being coated.

**DHP40.7.9 Submission for Approval**

The Contractor shall submit the following to the Engineer, including data sheets where applicable, for approval:

**DHP40.7.9.1 For Manufacture:**

- (a) Drawings
- (b) A programme
- (c) A quality control plan
- (d) A draft Operation and Maintenance Manual

**DHP40.7.9.2 For Corrosion Protection:**

- (a) A programme
- (b) The Quality Control Plan for corrosion protection duly completed
- (c) Blast material
- (d) Coating products
- (e) Pickling and passivation products

**DHP40.7.9.3 Manufacture and Corrosion Protection Programmes**

The manufacture and corrosion protection programmes shall state the time and place when the following will be conducted:

- (a) Inspection of material;
- (b) Hydrostatic testing of uncoated castings, pipes and fittings;
- (c) Manufacture of components;
- (d) Fettling or dressing;
- (e) Degreasing;
- (f) Water soluble salts test;



- (g) Blast cleaning and application of the first coat;
- (h) Application of intermediate and final coats; and
- (i) The commencement of Site repairs.

#### **DHP40.7.10 Cost of Quality Control**

The cost for quality control shall be included in the Tendered rates.

When surveillance results in rejection of the lot or when notice by the Contractor results in a fruitless trip, the cost borne by the Employer/Engineer shall be debited against the Contractor's account.

If additional inspections, tests and analyses requested by the Employer/Engineer prove that the corrosion protection of the equipment is in accordance with the Specification, the costs of the inspections and/or tests including transport will be defrayed by the Employer. However, should the additional investigations prove that the manufacture and/or corrosion protection of the equipment does not conform to the Specification, the cost shall be defrayed by the Contractor.

The Engineer shall have the right, without prejudice to any other legal remedy, to deduct such costs from payments due to the Contractor under the Contract.

Where Plant or services fail to meet the Contract requirements but are nevertheless accepted at an agreed revised rate, the costs with regard to inspections, test and analyses shall be for the Contractor's account unless otherwise directed by the Employer.

#### **DHP40.7.11 Non-compliance with the Specification**

Plant, materials and services that do not conform to the requirements of this Specification shall be rejected.

Such rejected Plant shall be held at the cost and risk of the Contractor who shall, when called upon, and at his own cost, repair the defects or corrosion protection according to the Contract.

Failing satisfactory repair of rejected equipment, the Plant shall be returned to the Contractor at his cost and risk without any opportunity to substitute the rejected Plant. Alternative Plant may be purchased at the Contractor's expense or an approved Contractor may be employed to do the repair to the corrosion protection.

Should the Contractor fail to comply with the provisions of the Painting and Corrosion Protection Specification, the Certificate of Commissioning shall not be issued.

#### **DHP40.7.12 Operation of Plant Prior to Taking Over**

The Contractor shall be responsible for all operations necessary for the adjustment and testing of the Plant until it has been taken over.

During the whole of the tests to be carried out, the Contractor shall be wholly responsible for the preservation, care and remedying of any defects of the Plant and he shall provide all labour, supervision, apparatus, materials, stores, instruments etc., necessary for these operations.

The Contractor shall permit and facilitate the Engineer's observation of the erection, installation, and testing of all Plant.

The Contractor shall ensure that specialist personnel from Subcontractors are on hand over the entire planned duration of the tests, and have made contingency plans to remain present in the event that the tests over-run their expected duration.

#### **DHP40.7.13 Defects Notification Period**

The Defects Notification Period shall commence on the date of issue of the Certificate of Commissioning by the Engineer to the Contractor or on completion of full flow testing, whichever is the latest and shall run for a period of 365 calendar days.



**DHP40.8 MEASUREMENT AND PAYMENT**

**DHP40.8.1 Basic Principles**

No separate payment shall be made for items covered in this Section. All such costs shall be deemed to be included in the price for any particular piece of equipment.

**DHP40.8.2 Scheduled Items**

Scheduled items are described in the applicable Particular Specification.

Table 1. Mean (SD) age, height, weight, and body mass index (BMI) of the 100 children in the study

Measure	Mean (SD)
Age (years)	10.1 (0.5)
Height (cm)	145.2 (10.1)
Weight (kg)	38.5 (10.2)
BMI (kg m <sup>-2</sup> )	18.6 (3.2)

children were asked to perform a series of 10 trials of the task. The first trial was a practice trial and the remaining 9 trials were recorded. The mean of the last 9 trials was used for analysis. The children were then asked to perform the task again, but this time they were asked to perform the task as fast as they could. The mean of the last 9 trials was used for analysis.

The children were then asked to perform the task again, but this time they were asked to perform the task as slowly as they could. The mean of the last 9 trials was used for analysis. The children were then asked to perform the task again, but this time they were asked to perform the task as fast as they could. The mean of the last 9 trials was used for analysis.

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**PARTICULAR SPECIFICATION DHP 47**  
**ELECTRICALLY OPERATED PASSENGER LIFT**



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## PARTICULAR SPECIFICATION DHP 47

### PASSENGER LIFT

#### DHP 47.1 SCOPE

##### DHP 47.1.1 Services Required

The scope of work shall include the design, supply of all materials, manufacture, shop assembly and testing, corrosion protection, delivery to Site, installation at Site, corrosion protection at Site, putting to work, testing, Tests on Completion, maintenance (other than normal operating maintenance), the provision of Operating and Maintenance Instruction Manuals and any other documentation as specified and a three-year maintenance period of the following equipment and which is described in detail hereinafter:

- ITEM 1: One electrically operated general-purpose passenger lift complete with rails, electric motor, all switch-and control gear, operating in the lift shaft generally as shown on the Drawings listed in Table 1 and as more fully described below. Built-in anchor plates for mounting of the rails are provided and installed by the Department inside the lift shaft up to RL 921,500 masl. The Contractor shall however design, supply and install his own stainless steel anchor plates or other anchoring system above RL 921,500, all to the satisfaction of the Engineer.

DRAWING NO	DESCRIPTION
<b>GENERAL- &amp; MECHANICAL DRAWINGS</b>	
	Locality Map
BF 1819	Diagram for Departmental Information
DHP 7668	Personnel Lift Shaft: Built-in Anchor Plates
<b>CIVIL DRAWINGS</b>	
DHP 4013	Outlet Works: Longitudinal Section
DHP 4023	Outlet Works: Horizontal Section 10-10
DHP 4024	Outlet Works: Horizontal Section 11-11
DHP 4025	Outlet Works: Horizontal Section 12-12
DHP 4026	Outlet Works: Section Through Emergency Gate Control Room
DHP 4028	Outlet Works: Section Through Emergency Gate Control Room
DHP 4044	Outlet Works: (Lift Shaft Pit)
DHP 4065	Outlet Works: Vertical Section

**Table 1**

**DHP 47.1.2 Conditions of Contract**

The conditions governing this Tender are as set out in the document "Particular Conditions of Contract for Mechanical & Electrical Works (General)".

Contracts will only be awarded to Tenderers who, in the Engineer's opinion, are capable of manufacturing and supplying to the required standard. Only Tenderers who can demonstrate that they are bona fide manufacturers of the equipment as specified in this Particular Specification, with their own local manufacturing- and service workshop and service network, may tender. Workmanship shall conform to accepted industrial standards and welders shall be coded. The size of tools and equipment used shall be proportional to the task being carried out.

The Department reserves the right to, at its own discretion, purchase the equipment listed in the Bill of Quantities as Item 1 to Item 6 from any of the offers received. Splitting of the purchase of equipment in this way shall not affect the Tender Price as indicated in the Bill of Quantities for any of the items offered.

Due to possible changes to the Scheme layout, it might happen that the requirements for the equipment are changed. The Department reserves the right to unconditionally, prior to placing the order, amend the quantity, size or rating of any equipment without suffering any penalties imposed by any Tenderer. Costing for any such changes after placing of the order shall be negotiated at that time.

Tenders shall only be awarded on a fixed price basis and no escalation shall be considered.

The Contractor shall make no changes or modifications to any part of the design or the equipment offered under this Contract without the written approval of the Engineer. The Department shall not accept any additional cost for any part of this Contract should any procedures contained therein not being complied with.

The Contractor shall make available appropriate staff with decision making authority from his company for meetings with the Department (this could include at the De Hoop Dam Site) when scheduled by the Engineer. No additional cost for such meetings will be considered.

**DHP 47.1.3 Defects Notification Period**

The Defects Notification Period as stipulated in the General Conditions of Contract for Construction Works, shall read 12 (twelve) months from the date of issue of the Commissioning Certificate by the Engineer to the Contractor and shall terminate with the issue of the Final Certificate by the Department. It is envisaged that commissioning will take place within 30 days of completion of all outstanding points. The Contractor's Guarantee shall include all aspects of the manufacturing process, including work done by any Sub-contractors.



**DHP 47.1.4 Target Date for Delivery**

The target date for complete installation of all the equipment at the De Hoop Dam Site is 12 months after date of order.

It is important to note that an early delivery is sought. Preference may be given to Tenderers offering early, reliable delivery dates. It is essential that the delivery periods quoted by the Tenderer are realised, otherwise penalties for delay may be enforced.

Target dates reflect the latest date the equipment shall be delivered to Site. The target dates for delivery to Site are important, since they influence subsequent works on the Construction programme.

If so required, the Contractor shall provide the Department with a bank guarantee (see attached "Form of Manufacture Payment Bond") as surety against any progress payments to be made in accordance with Particular Conditions of Contract for Mechanical & Electrical Works (General).

**DHP 47.2 STANDARD SPECIFICATIONS****DHP 47.2.1 Specifications and Supporting Standards**

This Particular Specification DHP 47 shall where applicable, have preference over all other sections of this Tender Document or any Standard Specifications referred to.

This Particular Specification shall be read in conjunction with the following:

**(a) Particular Mechanical Specifications for De Hoop Dam:**

Particular Specification DHP 40 – GENERAL MECHANICAL

**(b) Departmental Standard Specifications (which are available on request):**

STANDARD SPECIFICATION DWS 2020: QUALITY CONTROL SPECIFICATION  
(October 2001 edition)

STANDARD SPECIFICATION DWS 9900: CORROSION PROTECTION  
SPECIFICATION (September 2002 edition)

This Particular Specification is supported by the following standards of which the latest publication shall apply:

**(a) South African Bureau of Standards:**

SANS 121:	Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods.
SANS 1274:	Coatings applied by the powder-coating process.
SANS 1545:	Safety rules for the construction and installation of lifts
SANS 1700:	Fasteners

SANS 10 142-1:	The wiring of premises Part 1: Low-voltage installations
SANS 50 025-2:	Hot rolled products of structural steels Part 2: Technical delivery conditions for non-alloy structural steels.
SANS 50 081-1/ EN 81-1:	Safety rules for the construction and installation of lifts – Part 1: Electric lifts
SANS 60 529:	Degrees of protection provided by enclosures (IP Code)

### **DHP 47.3 DEFINITIONS AND ABBREVIATIONS**

#### **DHP 47.3.1 Definitions**

- Contractor:** The Party to whom the Tender comprising this Particular Specification is awarded.
- Employer:** Chief Directorate Business Management of the Department of Water and Sanitation.
- Engineer:** Chief Directorate Engineering Services of the Department of Water and Sanitation. For the purposes of this Particular Specification, the Engineer will be represented by the mechanical engineer of the Mechanical & Electrical Engineering Directorate named for "Enquiries" in the front part of the Tender Document.
- Installation:** This shall include, as applicable, all handling and transport from storage, if necessary, all erection and setting to work. All installation shall be done by the Contractor.
- Main Contractor:** The Directorate Construction-West (DCW) of the Department of Water and Sanitation. The main Contractor shall be responsible for the construction of the De Hoop Dam.
- Specification:** This Particular Specification together with any references therein to other documents.
- Supervising Engineer:** The De Hoop Dam Consultants (DHDC).
- Supply:** This shall include, as applicable, the purchase of materials or goods, manufacture and fabrication, any specified corrosion protection measures and any off-site inspection or testing.
- Tests on Completion:** This shall include, as applicable, all functional tests by the Engineer and load tests by a certified Lift Testing Authority (including the issuing of all Test Certificates and documentation as required by the Lifting Machines Inspector).

#### **DHP 47.3.2 Abbreviations**

masl :	meter above sea level
QCP :	Quality Control Plan

RL : Reduced level in metres above sea level (masl)

#### **DHP 47.4 EXTENT OF SUPPLY**

The lift shall be supplied strictly in accordance with the Drawings as listed in Table 1 and the supply shall include the following over the entire height of the lift shaft with a total of seven landings to be serviced:

- a) All the steel work for the lift shaft (excluding primary built-in anchor plates supplied and installed by the Department), guide rails, fixing brackets, anchor bolts, etc.
- b) The lift car, motors and steel wire ropes, complete in all respects.
- c) All switchgear and associated equipment, complete with cables, stainless steel cable racks, tubing and fittings where necessary within this lift Contract.
- d) All bolts, nuts, studs, washers, packing for installation of the equipment and all components needed for complete operation (as described in this Particular Specification) of the passenger lift are included in this Tender.
- e) A three year Preventative Maintenance Service as specified in Clause DHP 47.11 forms part of this Tender.
- f) The complete installation and testing, in accordance with this Particular Specification, as described in Clause DHP 47.15.

#### **DHP 47.5 COMPLIANCE WITH REGULATIONS**

The Contractor shall be responsible to design, supply and install any equipment and auxiliary equipment, which he may consider necessary for the proper and safe operation of the complete lift and which are required to conform to related standard Engineering Specifications and Regulations, over and above that which is being specified in this Particular Specification.

The Contractor shall conform to all Government regulations in respect of all equipment brought onto the Site, irrespective of whether it forms part of the permanent installation or not. The Contractor shall be responsible for the duties imposed and prescribed by and under the provisions of the Occupational Health and Safety Act, Act 85 of 1993, and by the regulations issued there under, or of any Act or Regulation issued in modification or substitution thereof.

#### **DHP 47.6 GENERAL REQUIREMENTS**

##### **DHP 47.6.1 Design**

The lift shaft shall be regarded as a moist operating environment. The complete design, including material selection, shall minimise corrosion and maintenance.

**DHP 47.6.2      Technical Schedules**

Tenderers shall fully complete the Technical Schedules included at the back of this Tender Document for the equipment offered. Failure to do so may result in the Tender being disregarded.

**DHP 47.7      MECHANICAL DETAILS AND REQUIREMENTS****DHP 47.7.1      General**

The lift shall as far as possible, be of a manufacturer's standard type with a minimum capacity of 550 kg (or seven persons). The complete lift supply shall comply with SANS 1545 and SANS 50 081 and with the Occupational Health and Safety Act (Act 85 of 1993) in all respects.

The internal size of the lift platform shall be the maximum size that can be fitted in the available space.

The lift shaft shall be regarded as a moist operating environment. The complete design, including material selection, shall minimise corrosion and maintenance.

**DHP 47.7.2      Lift Shaft Cover**

The top of the lift shaft is left open for easy access during installation.

After complete installation, the Contractor shall install a cover over the top of the lift shaft. This cover forms part of this Tender in all respects.

The cover shall be manufactured from hot dip galvanised mild steel sheet. It shall be of sturdy, light weight construction with appropriate lifting lugs and handles for easy removal. The shape shall prevent the retention of water on top of the cover. The cover shall be bolted in position on top of the lift shaft walls and shall not extend more than 300 mm above RL 926,000 masl.

The Tenderer shall include a drawing of the lift shaft cover offered in his Tender.

**DHP 47.7.3      Travel Requirements**

The travel required is from the level at RL 873,200 (bottom landing) to RL 921,500 (top landing), a distance of 48,3 metres. This shall service a total of 7 landings, including the bottom- and top landings (see Drawing No DHP 4065). The relevant levels of all the landings are as follows:

- |    |            |                  |
|----|------------|------------------|
| 1) | RL 873,200 | (Bottom landing) |
| 2) | RL 880,200 |                  |
| 3) | RL 887,200 |                  |
| 4) | RL 894,200 |                  |
| 5) | RL 901,200 |                  |
| 6) | RL 908,200 |                  |
| 7) | RL 921,500 | (Top landing)    |

The operating speed of the lift shall be 1,0 m/s minimum and with a maximum speed of 1,3 m/s.

#### **DHP 47.7.4 Landing Requirements**

Horizontal sliding telescopic doors shall be provided on each landing. These shall be mechanically and electrically interlocked with the lift car doors.

The landing doors and metal framework around them shall be stainless steel with hairline surface finish, similar to that of the doors.

#### **DHP 47.7.5 Lift Car Requirements**

A robust hot dip galvanised steel frame, that shall be capable of withstanding sudden shock and deformation in the event of malfunction of the operating gear, shall support the lift car.

The lift car shall be provided with horizontal sliding telescopic doors that shall open automatically when the car stops at a required landing. These shall be mechanically and electrically interlocked with the landing doors on each level. Opened doors shall render clear the full width of the access opening to the lift car.

A circular profile stainless steel handrail / protection bar shall be mounted right around the inside of the lift car at a height of 1 m from the floor.

Approved "No Smoking" signs shall be mounted appropriately inside the lift car.

The finishes inside the lift car shall be:

- a) Ceiling: Stainless steel with hairline surface finish.
- b) Walls (including control panel): Stainless steel with hairline surface finish.
- c) Floor: Non-slip type rubber.
- d) Doors: Stainless steel with hairline surface finish (inside and outside).
- e) Handrail / protection bar: Stainless steel with hairline surface finish.
- f) Mirror: No mirror required.

#### **DHP 47.7.6 Guides and Rails**

Guides and rails shall be securely supported against walls over their entire length by making use of the built-in anchor plates installed by the Department. The rail design shall prevent any part of the car or counterweight to touch the metal part of the guides or rails. The design of the complete guide rail system shall prevent the guide followers / rollers on the lift car to run off the rails at any time.

Rails shall be installed complete with end stops, clamps, anchor bolts, fish plates, etc. and shall be designed to permit expansion and contraction. The method of installation shall make provision for alignment of the rails in all directions. Alignment of rails by the Contractor is included in this Tender.



Due to the moist operating environment, all guides and rails shall be manufactured of stainless steel 304 (including 304 L) or alternatively 3Cr12. If not available, hot dip galvanised mild steel will be considered.

Guide rail lubricators shall be installed on all equipment running on / in them. The lubricating agent dispensed shall contain corrosion inhibitors compatible with the rail material to minimise corrosion in the humid environment of the lift shaft.

#### **DHP 47.7.7      Buffers**

Suitable buffers, in compliance with passenger lift requirements, shall be mounted in the pit at the bottom of the lift shaft or at the bottom of the lift car. The design of these units shall take cognisance of the fact that the pit might get flooded and shall be suitably corrosion protected.

#### **DHP 47.7.8      Bolts and Nuts**

All exposed fasteners, including those used for the fixing of proprietary items to the lift car and rails, shall be of stainless steel 304 or better. Where strength requirements prohibit this, bolts shall be hot dip galvanised. All bolts, nuts and washers used on hot dip galvanised structures shall also be hot dip galvanised. All fasteners shall comply with SANS 1700.

### **DHP 47.8      ELECTRICAL DETAILS AND REQUIREMENTS**

#### **DHP 47.8.1      General**

The electrical systems of the complete lift and associated equipment shall be in accordance with the applicable industrial standards and as further specified in this Particular Specification.

The electrical equipment shall comprise, but not be limited to, the operating motors with their controllers, brake-mechanisms, limit switches, lighting, main switches, fuses, anti-condensation heaters, power and signal conductors and collectors.

Control systems shall be designed to achieve the operational requirements stated. In particular the controllers shall allow smooth operation without jerk or snatch on all motions from standstill, each controller being provided with an adequate number of steps in either direction to achieve smooth acceleration or retardation.

All components of the control system shall operate with adequate safety margins to ensure reliable operation under all conditions of service with the minimum of maintenance. The lift shaft is regarded as a humid environment and all equipment shall be rated for this application.

All isolator switches shall be heavy duty and suitable for outdoor service.

#### **DHP 47.8.2      Power Supply**

The power supply available is 400 volt, 3-phase, 4 wire, 50 Hz.

The main isolator box with isolator will be provided by the Electrical Contractor at a point as mutually agreed. This isolator box shall not be more than 1,5 m above the floor level on

RL 921,500 masl in close proximity of the upper landing of the passenger lift. It shall isolate the entire electrical system of the passenger lift.

Cabling from this isolator box to the passenger lift operating system forms part of this Tender.

#### **DHP 47.8.3 Power Transfer to Equipment**

The reach of the power transfer mechanism shall enable the lift car to travel the full distance from RL 873,200 masl to RL 921,500 masl.

The minimum requirements for the power supply transfer system, regardless of the type and location, shall be:

- In cases where 3-phase loads are present, a 5-core cable (red, blue, white, neutral and earth) shall preferably be provided.
- Weather resistant and suitable for outdoor service in a humid atmosphere and in accordance with SANS 60 529 IP 65.
- Adequate personnel safety features in accordance with the relevant safety regulations.
- Protection covers shall be provided with a locking mechanism but shall none the less be easily removable for maintenance purposes.
- Conductor shoes and assemblies shall be spring-loaded.

#### **DHP 47.8.4 Electric Distribution Box**

All control gear shall be enclosed in a lockable stainless steel (Grade 304 or better and not less than 1,6 mm thick) cabinet mounted in an approved position at the lift in such a manner as will facilitate easy maintenance and inspection. The cabinet shall be in accordance with IP 65 of SANS 60 529. The door(s) shall be fitted with suitable seals to prevent the ingress of water and insects. This distribution box shall be powder coated to SANS 1274, Type 6 (textured finish). The colour shall be signal red. The enclosure door(s) shall be capable of fully opening, regardless of the position of the lift car. Safe access to the distribution box shall be provided.

It shall contain a triple pole, metal clad, airbreak isolator having provision for padlocking in the "OFF" position. This isolator switch, which shall have "On", "Off" and "Earth" positions, shall be supplied for isolating the main power supply to the lift and for earthing the longitudinal conductors. It shall be an integral part of the lift control and is not the same as the isolator specified in Clause DHP 47.8.2.

The electric distribution box shall have provision for the hanging of a "MAN WORKING" notice, which shall be included with the supply of the lift. An A-3 sized stainless steel storage compartment shall be mounted inside the cabinet door for storing the laminated electrical circuit diagrams.

Three red indicating lamps, marked L1; L2 and L3 (one per phase and which shall illuminate when the supply is on), shall be provided on the distribution box. These indicating lamps shall be of the 230 V LED multi-cluster type and shall be clearly visible in normal daylight.

A danger sign shall be provided and fixed onto the isolator box.

Control and operating circuit voltages shall not exceed 110V and the distribution box shall include auxiliary transformers, main and auxiliary circuit fuses, contactors and all other equipment required for the complete control system.

The electrical load on the three phases shall at all times be balanced.

A 3-pin 15 A single phase switched socket outlet shall be installed in the electric distribution box for maintenance purposes. It shall be fitted with an earth leakage protection unit.

#### **DHP 47.8.5 Electric Motors**

All motors shall be of the totally enclosed fan cooled squirrel cage type. Their characteristics and construction shall be suitable for outdoor elevator service with high starting torque and low starting current.

The motor for lifting operation shall be capable of continuous operation under full load as well as floor-to-floor duty.

The motors shall have the correct phase rotation of the power supply after the Site wiring and connections have been completed.

The lift machine location is at the top of the lift shaft in the upper control room (RL 921,500 masl) as indicated on Drawing No DHP 4026.

#### **DHP 47.8.6 Lift Car Control and Control Panel**

The lift car shall be operated by means of a push button control panel by an operator standing inside the car.

Each push button shall operate a single function, which shall be clearly indicated. Labels that only rely on adhesive to stay in position shall not be acceptable. All switches, indicators, etc., shall be weatherproof to IP 65 of SANS 60 529.

The car shall be equipped with an automatic return function that shall automatically return the car to landing no. 7 at level RL 921,500 masl when, over a minimum time span of 20 minutes, no car- or landing calls are registered or no motion has been detected by the door electronic safety detectors.

The car operating panel, mounted inside the car enclosure next to the door, shall contain the following:

- a) Push buttons to correspond to the various levels served, starting at landing no. 1 at level RL 873,200 masl. Each button shall contain an integral indicator light that shall light up when the button is activated and shall stay on until the specific landing has been reached.

- b) Digital display panel to indicate the relevant level position of the car with level No 1 at the bottom of the dam on RL 873,200 masl. This panel shall also indicate the direction of travel.
- c) An emergency light that shall automatically switch on in the event of a power failure. Due to the remote location of the De Hoop Dam, this light shall provide lighting inside the lift car for a period of at least 12 hours.
- d) A latching emergency stop switch for stopping the car independently of the regular operating devices. This switch shall also cancel all previous calls from and to other landings.
- e) An alarm button to activate an alarm bell located on the roof of the car and a siren (1 km range) on top of the Outlet Works.
- f) A communication system, as specified in Clause DHP 47.8.10, between the lift car and the local security guard office and other relevant Departmental officials.
- g) An interior car light (LED-type) and switch. This light shall use *Osram*-make LEDs or better and shall be guaranteed for minimum 5 000 continuous burning hours. This ceiling mounted light shall automatically switch off if the car is left unused for more than one hour. It shall however switch on again when any of the lift functions are activated, either from inside or outside of the lift car.
- h) A ventilation fan and switch. This ceiling mounted fan shall automatically switch off if the car is left unused for more than one hour.
- i) A "Door-Open" button for reversing the doors while closing. Doors shall remain in the open position until activation of the "Door Close" button.
- j) A "Door-Close" button for closing the doors before travel shall be allowed. Doors shall not close automatically.
- k) A key-operated lock-out switch with a set of three keys for conducting top-of-car inspections and services.
- l) A key-operated override switch with a set of three keys for resetting the "Lift Shaft Flooded"-indicator.

The contractor shall be responsible for providing and installing suitable waterproof LED-type lighting with waterproof switch on top of the lift car.

#### **DHP 47.8.7 Landing Requirements**

Call buttons for the lift shall be installed at each landing serviced. Each button shall illuminate when the button is pressed and shall remain illuminated until arrival of the lift car. The lift car door shall open automatically upon arrival at any landing and shall stay open until:

- The "Door Close" button inside the lift car is activated;
- The time span as described in Clause DHP 47.8.6 has lapsed.



The call button on landing no 7 (top) shall indicate and activate the "Down" function and the call button on the landing no 1 (bottom) shall indicate and activate the "Up" function. Call buttons on all intermediate floors shall be able to activate either of the "Up" or "Down" functions.

A waterproof, digital type lift car position indicator shall be provided above the lift entrance on the bottom and top landings. This indicator shall also indicate the direction of travel and when the lift is out of operation.

All electrical equipment at landings shall be protected to IP 65 of SANS 60 529.

#### **DHP 47.8.8      Lift Shaft**

The Contractor shall take note of the fact that the pit below the shaft could get flooded and all electrical equipment installed below RL 873,200 masl shall be in accordance with IP 68 of SANS 60 529. A warning system for such condition shall also be installed as specified in Clause DHP 47.8.11.

#### **DHP 47.8.9      Wiring Code Numbers**

Code numbers shall be fitted to all electrical cables, cable cores, wiring and terminal blocks inside switchgear panels and field devices to enable maintenance staff to trace faults easily. The wiring diagrams to be supplied with the Operating & Maintenance Manual (see Particular Specification DHP 40 – General Mechanical) shall have the same code numbers marked on them and shall be strictly in accordance with the actual wiring on the lift installation.

#### **DHP 47.8.10     Communication System**

A communication system, as specified below, shall be installed for use by persons inside the lift car during an emergency situation and shall provide absolute reliable communication with the outside world.

*GENCELL GSM LIFT INTERCOM or similar product of equal standard proven to the Engineer :*

The intercom system shall consist of two components, namely the:

- a) Audio module
- b) Main module

The audio module shall be mounted in the lift car. A speaker, microphone, and emergency button shall be mounted in an aluminium box.

The main module shall be mounted in the lift room on top of the lift shaft. An audio cable shall be connected between the main unit and the audio unit. The cable shall hang next to the cable of the lift car. A relay shall be available to connect a siren, which in turn will notify personnel whom are in close proximity. An external antenna connection shall also be available for use with an external antenna as recommended by the communication system supplier, especially in cases where signal strength is poor. The GSM module mounted on the main board shall be controlled by a micro processor and commands such as siren time, unit status intervals, AC failure time and the



changing of emergency numbers shall be controllable via an sms to the unit from anywhere, provided that the cell phone number is programmed into the unit, thus allowing access to the communication unit.

When the emergency button on the audio module in the lift car is pressed for longer than the pre-programmed time, normally 5 seconds, the siren shall sound and a pre-recorded message shall play as follows:

*"Please remain calm, an emergency message has been sent and emergency personnel will be in contact with you shortly".*

While the message is playing, the unit shall send an sms to official's pre-programmed cell phone numbers. These officials will then call the lift unit to establish communication with people in the lift car. The system shall make provision for sending as many as 200 sms's to pre-programmed numbers. The wording of the sms shall be changed to any explanation, depending on the situation, e.g.: "Lift car at level 3 at De Hoop Dam is stuck". An e-mail shall also be sent (to be used for statistics), provided that the network in the region supports this function.

The sim card of this communication system shall remain valid and active for a minimum of three years, starting from the date of commissioning.

The main unit shall have a power supply that can be connected to the 400 volt power supply. An uninterrupted power supply by means of battery back-up to support all communication equipment for at least 6 hours, shall be mounted inside the main unit for back-up power supply in case of a power failure. Batteries shall be automatically charged when electricity is available.

Suitable lightning protection units for the mains power supply and fire protection for the communication signal shall be included in this Tender. The Tenderer shall give details of these units in the Technical Schedule at the back of this Tender Document.

#### **DHP 47.8.11 Safety Devices**

All electric motors shall be provided with brakes as required by passenger lift safety regulations. The brakes shall be arranged to operate in such a manner to ensure that the load is held by the drive motor before the brakes are released. There shall be no slipping of loads when the drive motor is stopped or the electricity supply fails.

The complete lift installation and metal cases of all electrical equipment, including conduit and trunking shall be effectively earthed.

The lift doors shall be provided with electronic detectors that shall prevent them from being closed against an obstruction. These detectors shall scan the full height of both the car and landing doors.

An overload protection system shall prevent the lift car doors from closing in the event of the car being overloaded. This condition shall be indicated on the car control panel and by a buzzer inside the lift car. After reduction of the load in the lift car, operation shall proceed in the normal manner.

A warning system shall be installed in the bottom of the lift shaft to detect any flooding to a depth of more than 100 mm. In such an event the lift car shall move to the top level where after all operations of the lift shall be disabled and a warning indicator at the top and bottom landing shall light up (also refer Clause I).

A telecommunication system shall be installed as specified in Clause DHP 47.8.10.

#### **DHP 47.8.12      Weather Protection and Safety Guards**

Since the lift will work in a humid atmosphere, all electric fittings and contactors shall be waterproof and protected against the possible flooding of the outlet works of the dam. All electric fittings shall be in accordance to SANS 60 529, IP 65 unless otherwise specified or enclosed with an IP 65 rated enclosure such as the electric distribution box. All electric fittings shall also be vermin proof and protected against the harmful effect of corrosion.

All moving machinery, including electric motors, shall be guarded to the satisfaction of the Engineer. Guards, however, shall be easily removable for access and maintenance purposes.

#### **DHP 47.9            MATERIALS**

Materials not specified shall be selected for ease of maintenance and reliable operation.

Bolts, nuts, studs, washers, etc. shall be of stainless steel 304 or better. Where strength requirements prohibit this, fasteners shall be hot dip galvanised to SANS 121.

All guides and rails shall be manufactured of stainless steel 304 (including 304 L). If not available, 3Cr12 or hot dip galvanised mild steel will be considered.

Mild steel shall conform to SANS 50 025-2 / EN 10 025-2, Grade S355JR minimum

All stainless steels shall be grade 304 or better, unless otherwise specified.

Welding electrodes for welding mild steel to stainless steel shall have a high nickel & chrome content in order to give a weld deposit containing 18 % chromium (17 % minimum) and 8 % nickel (7 % minimum).

#### **DHP 47.10          CORROSION PROTECTION**

##### **DHP 47.10.1      General**

All equipment supplied under this Particular Specification shall conform to DWS 9900.

The lift operating gear shall be completely weatherproof under all weather conditions applicable to the Site and the steelwork designed and detailed so as to obviate the possibility of water entrapment prejudicing the life of the corrosion protection system employed. Hard to reach cavities shall be sealed from the atmosphere by welding, without prejudicing maintenance of any part of the installation. Joints between materials of different electrical potential shall be treated in accordance with DWS 9900.

Drainage holes, if required, shall be 50 mm in diameter.

**DHP 47.10.2 Proprietary Items**

Components that are supplied painted or protected e.g. motors, gearboxes, actuators etc. shall only be accepted provided that they meet the corrosion protection requirements of this Particular Specification. If this Particular Specification cannot be adhered to, the Contractor **shall submit full details of the equivalent coating systems** at tendering stage for approval by the Corrosion Engineer.

**DHP 47.10.3 Coating Systems****DHP 47.10.3.1 Passenger Lift**

ENVIRONMENT	MATERIAL	Item	SYSTEM	MINIMUM DFT (microns)
Dry/wet	MS	Rails/guides	HDG plus	105
			Two pack Epoxy on sides & bottom	250
	MS	Car structure	FBE	250
			HDG plus	105
			Two pack Epoxy	250

**DHP 47.10.3.2 Ropes**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
Dry	MS	Rope dressing - penetrating, water resistant with a non-sticky surface	Cover surface
Dry/Wet	MS	HDG plus penetrating and water resistant rope dressing with a non-sticky surface	85 Thin cover
	SS	Rope dressing as above	

## Control Cabinets/Panels

## Electrical Panels and Enclosures

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
Indoor – Dry	MS	1. Multi-purpose Epoxy plus Re-coatable Polyurethane if required	250 40
		2. Two pack Epoxy plus Re-coatable Polyurethane	250 40
		3. FBE	125
	PC ABS	Un-coated	
	GRP	Polyester gelcoat	250
	3Cr12	1. Multi-purpose Epoxy plus Re-coatable Polyurethane if required	125 40
		2. Two pack Epoxy plus Re-coatable Polyurethane	125 40
		3. FBE	100
Indoor – Wet	3Cr12 or SS 304	1. Two pack Epoxy plus Re-coatable Polyurethane	250 40
		2. FBE	125
	DCA	FBE	75
	PC ABS	Un-coated	
	GRP	Polyester gelcoat	250
Outdoor	3Cr12 or SS 304	1. FBP	150
		2. Multi-purpose Epoxy plus Re-coatable Polyurethane if required	250 40



**Cable Support Systems**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
<b>Dry Not exposed to UV</b>	MS	1. Two pack Epoxy	250
		2. Multi-purpose Epoxy	250
		3. FBE	150
		4. HDG	85
	3Cr12	Pickle and passivate – See note 4	
<b>Dry Exposed to UV</b>	MS	1. Two pack Epoxy plus Re-coatable Polyurethane	250 40
		2. Multi-purpose Epoxy	300
		3. FBP	150
		4. HDG	85
	3Cr12	Pickle and passivate – See note 4	
<b>Wet</b>	3Cr12	FBE	100
	SS 304 or SS 316	Pickle and passivate – See notes 3 and 4	

**Conduits**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
<b>Indoor - Dry</b>	MS	HDG	65
	PVC	Un-coated	
<b>Indoor - Wet</b>	SS 304	Pickle and passivate – See notes 3 and 4	
	PVC	Un-coated	
<b>Outdoor</b>	MS	HDG	65
	SS 304	Pickle and passivate – See notes 3 and 4	



**Junction Boxes**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
Indoor – Dry	DCA	FBE	50
	PVC	Un-coated	
	GRP	Polyester gelcoat	250
Indoor - Wet	DCA	FBE	75
	PVC	Un-coated	
	GRP	Polyester gelcoat	250
Outdoor	DCA	FBP	75

**Cable Mounting Straps and Clamps**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
Indoor	MS	HDG	45
	PVC	Un-coated	
	SS 304	Un-coated	
Outdoor	SS 304	Un-coated	

**DHP 47.10.3.3 Fasteners and Anchors****Fasteners**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
Fasteners and washers - Dry	MS	HDG plus threads coated with Molybdenum Disulphide lubricant	45
	SS 304	Threads coated with Molybdenum Disulphide lubricant or Nickel Anti-seize compound	Uniform cover
Fasteners and washers - Wet/Submerged	SS 316	1. Pickle and passivate - See note 3 plus threads coated with Molybdenum Disulphide lubricant or Nickel Anti-seize compound	Uniform cover
		2. FBE coated (thread surfaces excluded) plus threads coated with Molybdenum Disulphide lubricant or Nickel Anti-seize compound	50

**Anchors**

ENVIRONMENT	MATERIAL	SYSTEM	MINIMUM DFT (µm)
<b>Anchors in concrete -Dry</b> See paragraph 4.5.1 of DWS 9900	SS 316	Threads coated with Molybdenum Disulphide Lubricant or Nickel Anti-seize compound	Uniform cover
<b>Anchors in concrete – Wet</b> See paragraph 4.5.1 of DWS 9900	SS 316	Threads coated with Molybdenum Disulphide Lubricant or Nickel Anti-seize compound plus nut and washer FBE coated	Uniform cover  50

## DHP 47.10.3.4 Stainless Steel Items

SURFACES	COATING	MINIMUM DFT (µm)
<b>Stainless steel components (Dissimilar materials in submerged conditions)</b>	Two pack Epoxy or FBE to a smooth, glossy and uniform finish	125
<b>3CR12 steel components (All submerged conditions)</b>	Two pack Epoxy or FBE	400 250
<b>Stainless steel components (Dry or compatible metal conditions)</b>	Pickle and passivate – See note 4	
<b>3CR12 steel components (Dry conditions only)</b>	Pickle and passivate – See note 4	

## DHP 47.10.3.5 Abbreviations and notes

**Abbreviations:**

ABS	:	Acrylnitrile-butadiene-styrene
Al	:	Aluminium
CI	:	Cast iron
CS	:	Cast steel
DCA	:	Die cast aluminium

DFT	:	Dry film thickness
FBE:		Fusion-bonded Epoxy
FBP:		Fusion-bonded Polyester
FBPE	:	Fusion-bonded Polyethylene
GRP	:	Glass fibre reinforced Polyester
HDG	:	Hot-dip galvanized
HDPE	:	High Density Polyethylene
LHS	:	Left hand side
MS	:	Mild steel or any carbon steel
PC	:	Polycarbonate
PVC	:	Polyvinylchloride
RHS	:	Right hand side
SG	:	Spheroidal graphite cast iron
SS	:	Stainless steel – grades 304; 304L; 316; 316L; 2205
UV	:	Ultra Violet
3CR12:		Corrosion resistant steel
µm	:	Micrometer

**Notes:**

The following items shall be approved by the Corrosion Engineer:

- |    |                           |  |
|----|---------------------------|--|
| 1. | Hot-dip galvanizing       | Only for pipes up to 200 mm diameter maximum and flow less than 2 m/s.   |
|    | -                         | Pipes shall not be embedded in concrete.   |
|    | -                         | Water analysis shall be provided.  |
|    | -                         | Pipes over 200 mm diameter to be coated with a duplex system   |
| 2. | Sealant                   | Interfaces of different environments shall be sealed with a Polyurethane flexible sealant to be applied in accordance with the manufacturer's data sheets. |
| 3. | Un-coated stainless steel | - Only to be used if no galvanic reaction and anaerobic conditions are found.  |
| 4. | Pickle and passivate      | - If not in contact with less noble material.  |

- If exposed to anaerobic conditions seal-coat all crevices with solvent free Epoxy.
- Shall be done by the dipping process.
- 5. Galvanic cells - Where a galvanic cell is situated within a water path <150mm and concrete cover <75 mm, both the MS, 3Cr12 or SS shall be coated.
- 6. Anaerobic conditions - SS grade 316L shall be used under anaerobic and aggressive water conditions.
- 7. Polyurethane for - Re-coatable or pure Aliphatic Polyurethane where required colour coding for colour coding. Only UV resistant Polyurethane shall be used.
- 8. Primers - Primers shall only be used in special cases i.e. over-coating of galvanized surfaces.
- 9. 3CR12 - In view of superior corrosion resistance, coated 3CR12 material is preferred
- 10. Mild steel - Mild steel may only be used where the pipe lining can be refurbished in situ
- 11. Items subjected to - Items to be manufactured out of stainless steel or coated high temperatures with heat resistant paint.
- 12. Epoxy primer - Epoxy primer may not be required if appropriate two pack Epoxy/ Re-coatable or pure Aliphatic Polyurethane is being used.

#### **DHP 47.11 MAINTENANCE**

It is a pre-requisite to this Tender that the successful Tenderer shall be equipped and organised to give speedy service and maintenance at the De Hoop Dam on a twenty four hour per day basis when called upon. The Tenderer shall give full details in the Technical Schedule included in this Tender Document.

After completion of the installation, routine and preventative maintenance service for the equipment furnished under this Contract shall be provided for a period of thirty-six (36) calendar months, starting on the date of commissioning. This service shall consist of at least one visit per month for the first three (3) months and shall include regular examination of the installation during regular working hours by trained employees. The service shall further include all necessary adjustments, greasing, oiling, cleaning and provision of genuine standard parts to keep the equipment in proper operation, except replacement of any parts due to misuse, accidents or negligence caused by others. Thereafter, normal scheduled maintenance shall be provided for a further period of thirty three (33) months. All costs for rendering of the above thirty-six month



maintenance service shall be included in this Contract, but priced separately as indicated in the Bill of Quantities. Thereafter this Contract may be renewed by the Department on a yearly basis.

#### **DHP 47.12 TESTS**

Full mechanical- (including welding preparation and welding) and corrosion protection inspection of the items shall be carried out at the Manufacturer's Works in the presence of an Inspector appointed by the Engineer. Workmanship and dimensional correctness shall be checked prior to corrosion protection procedures.

After complete installation at Site, the fully assembled and installed equipment as specified shall be tested by the Engineer, in the presence of the Contractor, for functionality and compliance with this Particular Specification.

After complete installation at Site, the Contractor shall arrange for a certified Lift Inspector to carry out the tests and inspections as required by SANS 1545 and to complete all test- and inspection documents as published in SANS 1545. The Contractor shall arrange such tests and inspections to be witnessed by the Engineer. The Contractor shall issue to the Engineer one complete set of such test and inspection documents. These documents shall also be included in the Operating and Maintenance Manual (see Particular Specification DHP 40 – General Mechanical).

The electrical installation of the completely assembled and installed lift and associated equipment shall be tested at Site for compliance to SANS 10 142. A Certificate of Compliance shall be issued by an accredited Contractor as part of this Contract.

The above requirements form part of this Contract and shall be provided as part of the rates by the Contractor.

#### **DHP 47.13 DOCUMENTATION**

The Contractor shall supply the following duly completed and signed documentation in triplicate (excluding the Operating and Maintenance Manuals) and in a format which is acceptable to the Engineer.

##### **DHP 47.13.1 Prior to Installation**

Installation at Site shall only be allowed after acceptance by the Engineer of the following documentation:

- Copy of registration certificate of Lifting Machinery Entity (LME);
- Copy of Lifting Machinery Inspector (LMI) Certificate for Installer;
- Design drawings (assembly / installation) signed by competent designer;
- Signed off manufacturing QCP's (lift and associated equipment manufactured in terms of design drawings and all relevant regulations and specifications);
- Factory Load Test Certificates;



- Operating and Maintenance Manuals containing copies of all the above documentation and as otherwise specified in Particular Specification DHP 40 - General Mechanical.
- Installation Method Statement;

#### **DHP 47.13.2 After Installation**

The Contractor shall provide the Engineer within four weeks of completion of installation with the following documentation:

- Site Load Test Certificates
- Electrical Certificate of Compliance for all electrically operated equipment and the installation thereof;
- Copies of all the above documentation for inclusion into the final version of the Operating and Maintenance Manuals;
- Any other documentation as required by SANS 1545.

#### **DHP 47.14 HANDLING AND TRANSPORT**

Refer to Particular Specification DHP 40 - General Mechanical.

#### **DHP 47.15 INSTALLATION AND COMMISSIONING**

Any lifting equipment required inside the dam outlet structure shall be provided by the Contractor free of charge as part of his installation procedure.

The Contractor shall be responsible for the complete erection and installation of all equipment supplied under this Tender as well as for adjustments to ensure proper functioning of the complete lift system. The Contractor shall be responsible for all electrical connections to ensure safe and reliable operation of all systems as specified and under the conditions as set out for the De Hoop Dam.

Built-in stainless steel anchor plates are provided by the Department between RL 871,750 and RL 921,500, as indicated on Drawing No DHP 7668, for mounting of the rails by the Contractor. The Contractor shall adhere to the intervals between built-in anchor plates. Should any deviation be required, this shall only be allowed after written approval by the Engineer. The Contractor shall however design, supply and install his own stainless steel anchor plates or other anchoring system above RL 921,500, all to the satisfaction of the Engineer.

After installation of the lift car and associated equipment, the Contractor shall install the metal cover over the shaft (see Clause DHP 47.7.2).

The Contractor shall allow a full day after installation is completed for pre-testing of the equipment in the presence of the Engineer or his representative. At least two weeks advance notice of this date is required to enable the Engineer to finalise arrangements for attendance.

After comprehensive functional tests and general inspection of the entire installation, all outstanding defects, if any, shall be attended to by the Contractor within three weeks.

The Contractor shall advise the Engineer as soon as all the outstanding defects are remedied to set a date for final Testing and Commissioning of the passenger lift and to notify all the representatives (including the Contractor) to be on Site.

Any damage to Departmental structures or equipment as a result of the installation of any equipment under this Particular Specification shall be for the Contractor's account.

#### **DHP 47.16 MEASUREMENT AND PAYMENT**

Notwithstanding the breakdown as indicated in the Bill of Quantities, all the work and requirements of any nature as specified in this Particular Specification shall be covered by the Contractor in the pricing (INCLUSIVE OF VAT) as reflected in the Bill of Quantities. No additional cost for any work or requirement in this Particular Specification shall be allowed. All items covered by this Particular Specification shall be measured as final fabricated units meeting the functional requirements of the relevant specifications.

Payment will only be effected after full compliance of the items with the Specification has been certified by the Engineer.

<b>DHP 47.16.1</b>	<b>Design, Procurement and Manufacture and Supply of Equipment</b>	<b>Unit:    Number (No)</b>
--------------------	--	-----------------------------

Measurement shall be made on the basis of the specified equipment or associated items designed, manufactured and supplied, complete with Operating and Maintenance Manuals and all other pre-installation documentation as specified.

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; record drawings; operating and maintenance manuals; programmes of work (manufacture and on-site); manufacture and supply, including supply of raw materials and bought-out items; fabrication / manufacture / assembly; quality assurance and quality control; inspection and testing (including attendance of inspection / tests witnessed by the Engineer); type and routine tests; any special tools required for general maintenance, all lubrication required for operation of the equipment, trial erection and dismantling and any other work as specified.

<b>DHP 47.16.2</b>	<b>Corrosion Protection of Equipment</b>	<b>Unit:    Number (No)</b>
--------------------	--	-----------------------------

Measurement shall be made on the basis of the specified equipment or associated items completely corrosion protected in accordance with this Particular Specification.

The rates tendered shall include full compensation for the appropriate pre-preparation; application of any corrosion protection finishes as specified; quality assurance and quality control; inspection

and testing (including attendance on inspection / tests witnessed by the Engineer); type and routine tests; making good of corrosion protection after installation at Site. Payment under this Clause DHP 47.16.2 will only be effected after full compliance of the items with this Particular Specification has been certified by the Engineer.

**DHP 47.16.3      Delivery to Site** **Unit:    Number (No) or  
Sum**

Measurement shall be made on the basis of the specified equipment or associated items transported and delivered to Site.

The rates tendered shall include full compensation for the preparation and packing for transport; transport from place of manufacture to the Site; insurance, harbour dues etc., during transport; loading and offloading; inspection during loading and offloading; delivery and any other work as specified.

**DHP 47.16.4      Installation of Equipment** **Unit:    Number (No) or  
Sum**

Measurement shall be made on the basis of the specified equipment or associated items installed.

The rates tendered shall include full compensation for the installation of all the specified equipment, 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, electrical panels, cabling, etc., to complete a workable installation; supply of all consumables (electricity, fuel, oil and lubricants, etc.) necessary for the operation of the installation until taking over by the Employer; the putting into service of the complete installation and any other work as specified.

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

**DHP 47.16.5      Tests on Completion and Commissioning** **Unit:    Number (No) or  
Sum**

Payment for Tests on Completion shall only be made upon successful completion of Site testing.

The rates tendered shall include full compensation for all Tests on Completion and Commissioning, including labour, supervision, materials, instruments, calibrated test loads, issuing of Load Test Certificates and all post-installation documentation, etc. necessary for the Tests on Completion, assuming responsibility for all operations necessary during testing, (including attendance on 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.

**DHP 47.16.6 Three Year Maintenance Period****Unit: Lump sum (Sum)**

Payment will be made for full maintenance contract for a period of thirty-six calendar months and as described in Clause DHP 47.11. The starting date of this period shall be determined by the Engineer. After this period has lapsed, the maintenance contract may be renewed by the Department.

**DHP 47.16.7 Spare Parts (NOT TO BE INCLUDED IN TOTAL TENDER PRICE)****Unit: Lump sum (Sum)**

Items will be scheduled either as individual items or as a lump sum.

The Tenderer shall propose and submit a price list for all programmed maintenance and strategic / breakdown spares for all the equipment offered. These spares shall be manufactured concurrently with the Contract. Such spares shall be supplied to Site as may be ordered and at the prices quoted in the Spare Parts Price List. The Total Price for spares is to be excluded from the Total Tender Price.

The actual sum to be paid shall be based on the unit rates priced in the Spare Parts Price List for the actual spares ordered and supplied and the Employer 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.

# **OLIFANTS RIVER WRDP DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

## **SECTION 7: TECHNICAL SCHEDULES**

- **TECHNICAL SCHEDULE FOR PARTICULAR SPECIFICATION DHP 47**
- **TECHNICAL SCHEDULE FOR CORROSION PROTECTION**
- **TEST CERTIFICATES FOR COATING MATERIAL**
- **QUALITY CONTROL PLAN FOR CORROSION PROTECTION**
- **COATING APPLICATION RECORD**
- **SURFACE PROFILE AND DRY FILM THICKNESS READINGS**



DEPARTMENT OF WATER AND SANITATION

TENDER DWS 04-0419 WTE

TECHNICAL SCHEDULE FOR PARTICULAR SPECIFICATION DHP 47

*(Failure to fully complete this schedule may result in the Tender being disregarded.)*

**GENERAL**

- |  |  |
|--|--|
| 1. Brand or model  | _____  |
| 2. Name of Manufacturer  | _____  |
| 3. Country of manufacture  | _____  |
| 4. Agent's name  | _____  |
| 5. Is lift manufactured under licence?   | YES/NO *                                     |
| 6. Name of firm responsible for licence  | _____  |
| 7. Is the Tenderer a bona fide lift supplier?  | YES/NO *                                     |
| 8. Does complete supply comply with SANS 1545?   | YES/NO *                                     |
| 9. Does the Tenderer have his own local manufacturing and service workshop in S.A. with regard to the equipment offered? (Provide address) | YES/NO *<br>_____<br>_____<br>_____<br>_____ |
| 10. Does the Tenderer offer a local service and spare parts network?   | YES/NO *                                     |
| 11. Number of similar lifts manufactured   | _____  |

**LIFT CAR**

- |  |                               |
|--|-------------------------------|
| 12. Total mass of completely assembled car     | _____ kg                      |
| 13. Maximum load allowed in car                | _____ kg                      |
| 14. Mass of counterweight                      | _____ kg                      |
| 15. Maximum number of persons allowed in car   | _____                         |
| 16. Number of stops (including top and bottom) | _____                         |
| 17. Size (width x depth x height)              | _____ W x _____ D x _____ H m |
| 18. Finish                                     |                               |
| (a) Walls inside                               | _____                         |
| (b) Doors inside                               | _____                         |
| (c) Doors outside                              | _____                         |
| (d) Floor                                      | _____                         |
| (e) Ceiling                                    | _____                         |
| (f) Frame around door at each landing          | _____                         |
| 19. Ceiling light type                         | _____                         |
| 20. Car group                                  | _____                         |

\* Delete which is not applicable.

DEPARTMENT OF WATER AND SANITATION

TENDER DWS 04-0419 WTE

TECHNICAL SCHEDULE FOR PARTICULAR SPECIFICATION DHP 47 (continued)

21. Communication system (attach technical brochures)

- (a) Brand name
- (b) Product code
- (c) Communication range
- (d) Brand and product code of lightning protection provided on mains power supply
- (e) Brand and product code of lightning protection provided on communication signal

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**DRIVE SYSTEM**

22. Travelling speed for maximum load

Up: \_\_\_\_\_ Down: \_\_\_\_\_ m/s

23. Motors

- (a) Type
- (b) Protection
- (c) kW and speed at full load
- (d) Starting current
- (e) Power supply requirement

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---

\_\_\_\_\_ kW \_\_\_\_\_ r.p.m.

\_\_\_\_\_ A

\_\_\_\_\_ kVA

24. Particulars of safety devices and brakes

- (a) Brakes
- (b) Buffers
- (c) Limit switches
- (d) Safety switches

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25. Particulars and material of wire rope

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26. Materials for construction of guides and rails

---

**MAINTENANCE**

27. Is the Tenderer licensed for service and maintenance of the equipment offered?

YES/NO \*

28. Licence / registration number

---

29. 24 Hour emergency number

---

30. Is the above telephone number manned at all times?

YES/NO \*

31. Town in South Africa from where maintenance team will be dispatched on 24 hour basis?

---

32. Number of qualified maintenance assistants based at the above depot?

---

33. Approximate reaction time from maintenance depot to De Hoop Dam at any time of the week?

---

h

\* Delete which is not applicable.

**DEPARTMENT OF WATER AND SANITATION**

**TENDER DWS 04-0419 WTE**

**TECHNICAL SCHEDULE FOR PARTICULAR SPECIFICATION DHP 47 (continued)**

**CONTRACTUAL**

34. Have all Sub-contractors been issued with a copy of the relevant Specification pertaining to their part of this Contract?

YES/NO \*

35. Deviations from Specification for equipment, if any

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36. Amendment(s) No.(s) received /  
No amendment(s) received.

---

\* Delete which is not applicable.

---

SIGNED BY CONTRACTOR

---

DATE

**DEPARTMENT OF WATER AND SANITATION**

**TENDER DWS 04-0419 WTE**

## TECHNICAL SCHEDULE FOR CORROSION PROTECTION

***(Failure to fully complete this schedule may result in the Tender being disregarded.)***

Applicator proposed	Name:		
	Contact person:		
	Tel.:		
	Address:		
Value corrosion protection (the lot)	R		
List of products offered:	Coat/Stage	Product	Code
		Append pamphlets	
	Primer System (if needed)		
Poly-urethane aliphatic	Top coat		
Pickling paste	Surface prep.		
Passivating paste	Surface prep.		
Blasting Media: For stainless steel : For steel	Surface prep.		
	Surface prep.		
Remarks/Deviations			
Name of Tenderer:			
	Signature:		
	Date:		

Name of Tenderer  
(Blockletters)

Signature of Tenderer: \_\_\_\_\_

Tel: \_\_\_\_\_ Fax: \_\_\_\_\_

Date: \_\_\_\_\_

**\*Not to be included in Total Tender Price**

**DEPARTMENT OF WATER AND SANITATION**

**TENDER DWS 04-0419 WTE**

**TEST CERTIFICATES FOR COATING MATERIAL**

The Manufacturer's test certificate shall contain the following information to be supplied with each batch of product delivered to the Contractor:

**TABLE 1: SINGLE-PACK MATERIAL**

Date:			
Product:			
Reference no.:			
Batch no.:			
Colour:			
Quantity made:			
Shelf life:			
Volume solids:			
<b>Item</b>	<b>Method</b>	<b>Parameter</b>	<b>Results</b>
Fineness of grind:	SANS 178		
Viscosity:	SANS 5153		
Mass/l:	SANS 5050 / 2811-1		
Non-volatile mass,%:	SANS 5193 / SANS 3251		
Surface dry:	SANS 5148		
Hard dry:	SANS 5148		
Volume solids:	ISO 3233		



**DEPARTMENT OF WATER AND SANITATION****TENDER DWS 04-0419 WTE****TEST CERTIFICATES FOR COATING MATERIAL****TABLE 2: TWO-PACK MATERIAL**

Date:			
Product no.:			
Reference no.:			
Batch no.:			
Colour:			
Quantity made:			
Shelf life (base):			
Shelf life (curing agent):			
Mixed volume solids:			
Mixing ratio (by volume):			
Item	Method	Parameter	Results
Base fineness of grind:	SANS 178		
Base viscosity:	SANS 5153		
Base mass/l:	SANS 5050 / 2811-1		
Curing agent viscosity:	SANS 5153		
Curing agent mass/l:	SANS 5050 / 2811-1		
Mixed viscosity after 1/120 of pot life at 20°C:	SANS 5153		
Mixed mass/l:	SANS 5050 / 2811-1		
Mixed non-volatile mass, %:	SANS 5193 / SANS 3251		
Surface dry:	SANS 5148		
Hard dry:	SANS 5148		
Mixed pot life (for 1ℓ of mix):	SANS 5153		
Mixed volume solids:	ISO 3233		

## QUALITY CONTROL PLAN FOR CORROSION PROTECTION

PROJECT:			QCP NO.:	
EQUIPMENT:		SECTION:		REVISION:
DRAWING NO.:	QTY.:	FACTORY ID NO.:		COMPILED BY:
CLIENT:			CONTRACT NO.:	DATE:
CONTRACTOR:			ORDER NO.:	
APPLICATOR:			CONTACT PERSON:	
			CONTACT PERSON:	

## APPROVALS

CONTRACTOR NAME: SIGNATURE: DATE:	ENGINEER NAME: SIGNATURE: DATE:	DWAF QC NAME: SIGNATURE: DATE:	END USER NAME: SIGNATURE: DATE:
--	--	---	--

### LEGEND

H - HOLD POINT	W - WITNESS POINT	S - SURVEILLANCE	R - REVIEW
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## INSPECTION CODE

1 -APPROVAL	3 -TESTING	5 - REPORT REQUIRED	
2 -MATERIAL CERTIFICATE	4 -VISUAL	6 - RECORD REVIEW	

## QUALITY CONTROL

[illegible]

# SURFACE PROFILE AND DRY FILM THICKNESS READINGS

PROJECT:															
EQUIPMENT:										SECTION:					
DRAWING NO.:						QTY.:		FACTORY ID NO.:							
CLIENT:										CONTRACT NO.:				ORDER NO.:	
CONTRACTOR:										CONTACT PERSON:					
APPLICATOR:										CONTACT PERSON:					

## SURFACE PROFILE

DATE:

WET SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

DRY SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

## DFT FIRST COAT

DATE:

WET SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

DRY SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

## DFT SECOND COAT

DATE:

WET SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

DRY SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

## DFT THIRD COAT

DATE:

WET SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

DRY SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

## DFT FINAL COAT

DATE:

WET SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

DRY SURFACE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE
TOP														
MIDDLE														
BOTTOM														

## FLANGE FACES

DATE:

FLANGE SIZE	1	2	3	4	5	6	7	8	9	10	TOTAL	MIN.	MAX.	AVERAGE

## COMMENTS

.....

.....

.....

.....

.....

# COATING APPLICATION RECORD

<b>2. Pre-preparation</b>															
Dress protrusions & pits:															
Radius sharp edges:															
Repair blowholes in castings:															
Fettle welds:															
Remove weld spatter, burrs, laminations, scale & scabs:															
Primary cleaning:															
<b>3. Degreasing</b>															
Material reference:								Batch number:							
"Water break free" test:															
<b>4. Rough blast cleaning</b>															
Date of rough blast cleaning:								Blasting material:							
<b>5. Measurement of soluble salts</b>															
Maximum at any point:								mg/m <sup>2</sup>		Average over 250 cm <sup>2</sup> :				mg/m <sup>2</sup>	
Maximum at any point - final reading:								mg/m <sup>2</sup>		Average over 250 cm <sup>2</sup> - final reading:				mg/m <sup>2</sup>	
Wet cleaning/Re-blasting:															
<b>6. Final blast cleaning</b>															
Blasting material:								Cleanliness - wet surface: Sa							
Material certificate no.:								Cleanliness - dry surface: Sa							
Material pH:				Hardness:		Moh's scale		Residual dust & debris:						%	
Surface profile:		Maximum:		μm		Minimum:		μm		Average:		μm			
Date of final blast cleaning:								Time completed:							
<b>Ambient conditions</b>		<b>First coat</b>			<b>Second coat</b>			<b>Third coat</b>			<b>Final coat</b>				
Time:		8:00		12:00		16:00		8:00		12:00		16:00			
Rain: Yes/No															
Ambient temperature: °C															
Substrate temperature: °C															
Relative Humidity: %															
Dew point: °C															
<b>7-9 Application of coats</b>		<b>First coat</b>			<b>Second coat</b>			<b>Third coat</b>			<b>Final coat</b>				
Base : Material reference															
: Batch number															
Activator : Material reference															
: Batch number															
Thinner/solvent : Type															
: Batch number															
Application equipment:															
Colour:															
Surface preparation:															
Areas stripe coated:															
Date of application:															
Time application started:															
Time application completed:															
Wet film thickness:															
Wet surface DFT : Min. / Ave.		μm		μm		μm		μm		μm		μm			
: No-off readings															
Dry surface DFT : Min. / Ave.		μm		μm		μm		μm		μm		μm			
: No-off readings															
Flange/mating surface DFT: Min. / Max.		μm		μm		μm		μm		μm		μm			
: No-off readings															
<b>10. Completed system</b>															
Visual appearance:															
Electrical Insulation Defect at								V:							
Adhesion test:															
Cure test:															
<b>11 Stainless steel - uncoated components</b>															
<b>Degreasing</b>															
Date of degreasing:								Material reference:				Batch no.:			
<b>Pickling and passivation</b>															
Date of pickling:								Material reference:				Batch no.:			
Date of passivation:								Material reference:				Batch no.:			







# **OLIFANTS RIVER WRDP DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

## **SECTION 8: BILL OF QUANTITIES AND PRICING**

- **PREAMBLE TO BILL OF QUANTITIES**
- **PRICE SCHEDULE (FORM SBD 3.1)**
- **BILL OF QUANTITIES**
- **SPARE PARTS PRICE LIST**

# **PREAMBLE TO THE BILL OF QUANTITIES**

## **1 GENERAL**

The complete Tender Document compiled by the Engineer shall be read in conjunction with the Bill of Quantities.

In this Bill of Quantities the headings and item descriptions identify the work covered by the respective items and shall be read in conjunction with those items contained in the Measurement and Payment Clauses of the various Specifications contained in this document as cross referenced.

The nature and extent of the work is to be ascertained by reference to all the documents comprising the Contract. Where Clause references are contained in item descriptions, these are given for guidance only and are not exclusive to other relevant provisions of the Contract.

The rates and prices entered in the Bill of Quantities shall represent full compensation for executing and completing the work as specified or implied including inter alia the following, unless explicitly stated otherwise:

- General obligations, overheads, liaison, liabilities and risks involved in the proper management and execution of the Works as set forth in or reasonably to be implied from the Contract.
- All taxes, duties, surcharges, royalties and the like payable by the Contractor.
- Complying with Health and Safety, Environmental, Recruitment and Training, Industrial Relations and Quality Management provisions.
- All testing and quality control and supplying results of tests carried out by the Contractor to the Engineer. Attendance and transport for sampling and testing carried out by the Engineer.
- Design, drawings and documentation for Mechanical and Electrical Equipment.
- Preparation and timely supply of detailed working drawings as applicable.
- The submission of Method Statements as required by the Engineer.
- Preparation and timely supply to the Engineer of all the specified records of the Works.
- The effect on the planning of the Works.
- Labour and supervision.
- The procurement and supply of materials and goods including purchase, loading, transport, delivery to and handling at Site, storage and eventual delivery to and handling at the point of incorporation in the Works. Taking delivery of materials and goods supplied by others, handling, storage and incorporation of materials and goods into the Works.
- Handling and transport on Site of all equipment supplied under this Tender.
- Processing of goods and materials as specified and as necessary and incorporation in the Works as specified such that the Works shall be fit for the purpose for which they are being provided.
- Contractor's Equipment supply and utilisation.
- Temporary Works and infrastructure requirements.

- Waste.
- All test on completion, maintenance and remedying of defects during the Contract, including the Defects Liability Period.
- Profits.
- All other incidentals necessary for the completion of the work, and maintenance thereof, as specified in the Tender Document.

With reference to the Project Specification, the pay items provided in the Bill of Quantities comprise the total of all items intended for use in effecting payment in full for the Works. No payment will be made for any item not listed as a pay item or not shown in the Bill of Quantities (other than authorised varied work) and the Contractor shall allow in his tendered rates and prices for such items of work, which in his opinion, have been omitted.

The Bill of Quantities does not form the basis on which the Contractor shall order materials for the construction of the Works. Responsibility for the accuracy of quantities of materials ordered shall be solely that of the Contractor.

Note:

Tenderers shall ensure that their unit prices are correct. The final tender price shall be calculated from unit prices and any mathematical errors shall be corrected in the tendered amount.

## **2 MEASUREMENT OF COMPLETED WORK**

Except where otherwise specified in the Measurement and Payment clauses contained in this document, the measurement of work shall be computed from the dimensions given on the Drawings.

## **3 PRICING OF ITEMS**

A price or rate shall be entered against each item in this Bill of Quantities, whether or not quantities are stated. Any Tender which accompanied of a fully priced, totalled and completed Bill of Quantities may be rejected. Items which are not priced will be taken as NIL and the work will be deemed to be covered by the prices and rates entered against other items.

Where allowance is made in the Bill of Quantities for the Tenderer to enter items and the space allowed is insufficient for the purpose, the Tenderer shall attach such additional Bill pages to the back of the relevant page of the Bill. **Any such additions shall be clearly referenced and identified as additional pages and will be deemed to be an integral part of the Bill.**

The Tenderer shall note that it is a requirement that all Bill items shall be realistically and correctly priced and, in particular, unrealistic pricing of Bill Items relating to Health and Safety, Environmental and Maintenance of Facilities will not be accepted.

Rates and prices shall be expressed to two decimal places except in the case of a "NIL" rate or price.

**THE TOTAL TENDER (BID) PRICE SHALL INCLUDE VALUE ADDED TAX (VAT).**

## **4 USE OF ALTERNATIVE SPECIFIED MATERIALS**

Where in the Contract a choice of alternative materials is indicated for a given purpose, the description scheduled and the rates and prices inserted shall be deemed to cover any of the permitted alternative materials which the Contractor may elect to use.

## 5 UNITS OF MEASUREMENT

The following abbreviations may be used for the units of measurement:

UNIT	ABBREVIATION	UNIT	ABBREVIATION
Day	d	Millimetre	mm
Gram	g	Number	No
Hour	h	Provisional Sum	PS
Kilogram	kg	Rand	R
Kilometre	km	Square metre	m <sup>2</sup>
Metre	m	Square millimetre	mm <sup>2</sup>
Metric Ton	T	Sum, lump sum	Sum
Micrometre	µm	Week	wk

**PRICING SCHEDULE – FIRM PRICES**  
**(Purchases)**

**SBD 3.1**

**NOTE: ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED.**

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT.

<b>CLOSING TIME 11:00 ON:</b> .....	<b>BID NO.: W</b> .....
<b>NAME OF BIDDER:</b> .....	

**OFFER TO BE VALID FOR 90 DAYS FROM CLOSING DATE OF BID**

ITEM NO	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)
As per Bill of Quantities following this page	As per Bill of Quantities following this page	As per Bill of Quantities following this page	As per Bill of Quantities following this page
		<b>15 % VAT</b>	
		<b>TOTAL BID PRICE</b>	<b>R</b>

- Required by: Directorate Construction for OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT
- At (Place of delivery): DE HOOP DAM
- Brand and model: .....
- Country of origin: .....
- Period required for delivery after receipt of order: .....
- Delivery period: FIRM / NOT FIRM
- Does the item offered comply with any recognise Standards body, e.g. SABS? \* YES / NO
- If so furnish valid certificate to this end ATTACHED / NOT ATTACHED
- Is offer strictly to specification? \* YES / NO
- If not to specification, state deviation(s) .....
- Delivery basis. See note hereunder .....

**NOTE:** All delivery costs must be included in the bid price, for delivery at the prescribed destination.

\* Delete whichever is not applicable.

\*\* "all applicable taxes" includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.



ITEM NO	PAY REF	SHORT DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	DHP47	<b>PASSENGER LIFT</b>				
	47.16.1	<b>Design, Procurement, Manufacture and Supply</b>				
		- Passenger lift, complete	No	1		
	47.16.2	<b>Corrosion Protection</b>				
		- Passenger lift, complete	No	1		
	47.16.3	<b>Transport and Delivery to Contractor's Site Store</b>				
		- Passenger lift, complete	No	1		
	47.16.4	<b>Installation of Equipment</b>				
		- Passenger lift, complete	No	1		
	47.16.5	<b>Tests on Completion and Commissioning</b>				
		- Passenger lift, complete	No	1		
	47.16.6	<b>- 3 Year Maintenance Period</b>				
		- Passenger lift, complete	Sum	1		
<b>TOTAL TENDER PRICE (INCLUDING 15% VAT)</b>						
	47.16.7	<b>Spares (NOT TO BE INCLUDED IN TOTAL TENDER PRICE)</b>				
		- Passenger lift, complete	Sum			
<b>TOTAL PRICE FOR SPARES (INCLUDING 15% VAT) (NOT TO BE INCLUDED IN TOTAL TENDER PRICE)</b>						

## SPARE PARTS PRICE LIST

<b>Item off</b>	<b>Number off</b>	<b>Type or Serial No</b>	<b>Description</b>	<b>Delivered to Site price (in RSA currency including VAT) RAND</b>
				<b>*TOTAL PRICE:</b> <b>R</b>

**\*Not to be included in Total Tender Price**

the 1990s, the number of people in the UK who are employed in the public sector has increased by 1.5 million, from 2.5 million in 1980 to 4 million in 1995. The public sector has also become an important employer of women, with 50% of public sector employees being women in 1995.

There are a number of reasons why the public sector has become an important employer of women. One reason is that the public sector has a high proportion of women in the workforce. Another reason is that the public sector has a high proportion of women in the management and professional occupations. A third reason is that the public sector has a high proportion of women in the health and social care sectors.

The public sector has also become an important employer of women because of the increasing demand for public services. The demand for public services has increased in a number of areas, including health and social care, education, and housing. This has led to an increase in the number of people employed in the public sector.

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**OLIFANTS RIVER WRDP  
DE HOOP DAM**

**TENDER DWS 04-0419 WTE**

**SECTION 9:**

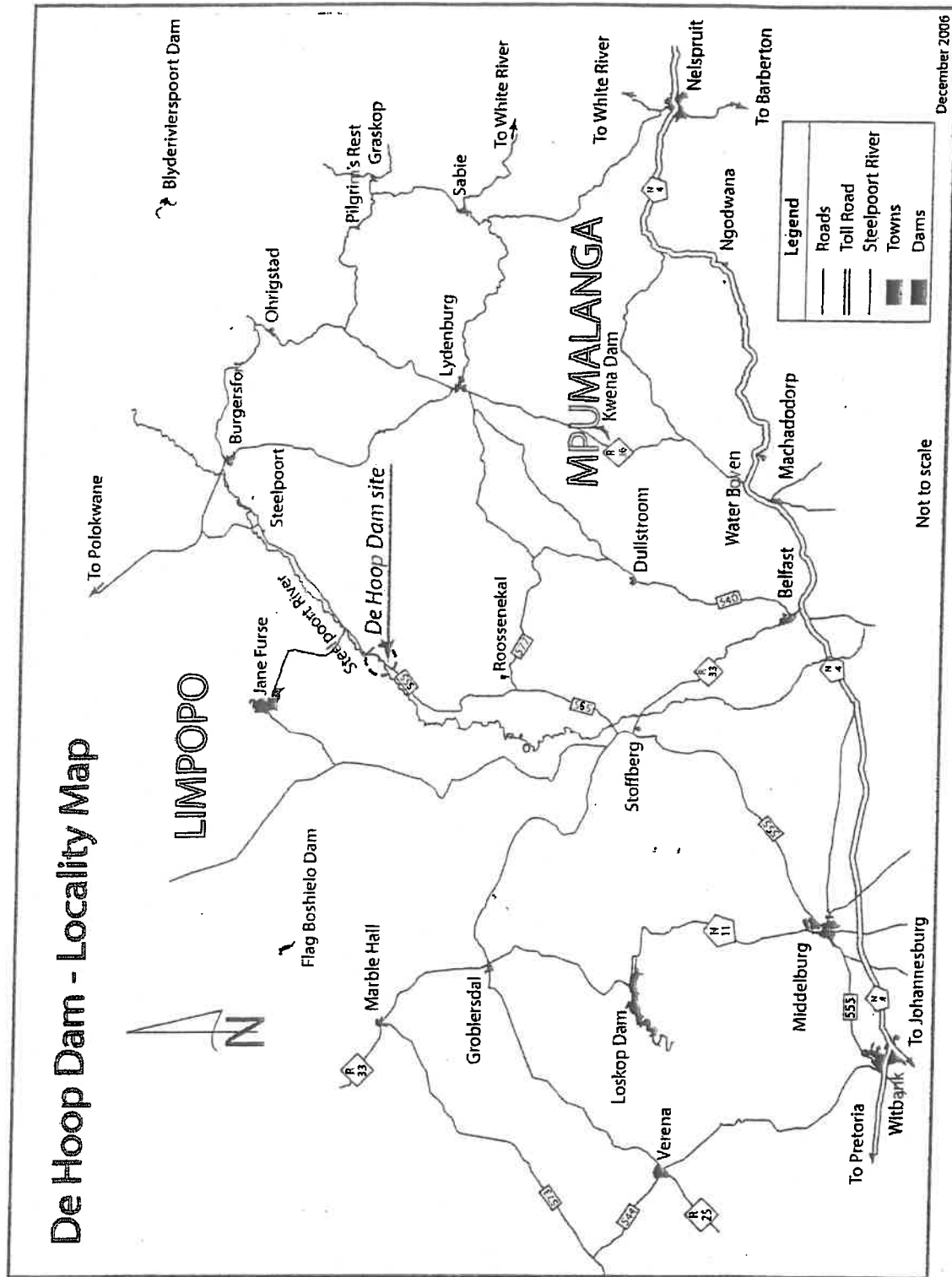
**DIAGRAMS & TECHNICAL  
DRAWINGS  
FOR  
PARTICULAR SPECIFICATION  
DHP 47:  
PASSENGER LIFT**

## LIST OF DIAGRAMS AND DRAWINGS INCLUDED

DRAWING REG. NO.	DESCRIPTION
<b>GENERAL DRAWINGS</b>	
-	LOCALITY MAP
BF 1819	DIAGRAM FOR DEPARTMENTAL INFORMATION
<b>MECHANICAL DRAWINGS: BUILT-IN ANCHOR PLATES IN LIFT SHAFT</b>	
DHP 7668	Personnel Lift Shaft: Built-in Anchor Plates
<b>CIVIL DRAWINGS</b>	
DHP 4013	Outlet Works: Longitudinal Section 01 – 01 on Centreline of Outlet Works
DHP 4023	Outlet Works: Horizontal Section 10 - 10
DHP 4024	Outlet Works: Horizontal Section 11 - 11
DHP 4025	Outlet Works: Horizontal Section 12 - 12
DHP 4026	Outlet Works: Section through Emergency Gate Control Room
DHP 4028	Outlet Works: Section through Emergency Gate Control Room
DHP 4044	Outlet Works: (Lift Shaft Pit)
DHP 4065	Outlet Works: Vertical Section



# LOCALITY MAP



Location of De Hoop Dam showing Surrounding Towns

DEPARTMENT OF WATER AND SANITATION  
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE  
M / E ENGINEERING  
PRIVATE BAG X313  
PRETORIA 0001



SEDIBENG BUILDING  
185 FRANCIS BAARD STREET  
PRETORIA  
(012) 336-7500

DIRECTOR GENERAL

SCHEME

PROVINCE:

DISTRICT:

KEY CODES:

CALCULATION FILE:

TENDER No.:

LOCALITY No.:

CONTRACT No.:

SHEET  
OF

DEPARTMENT OF  
WATER & SANITATION  
DRAWING REG. No.

REV. No.

DEPARTMENT OF WATER AND SANITATION  
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE  
M / E ENGINEERING  
PRIVATE BAG X313  
PRETORIA 0001



SEDIBENG BUILDING  
185 FRANCIS BAARD STREET  
PRETORIA  
(012) 336-7500

DIRECTOR GENERAL

CHECKED: *[Signature]* 6/3/2019  
DATE:

DESIGN:  
DRAWN:

ENGINEER: *[Signature]* 6/3/2019  
DATE: EXTERNAL APPROVAL: *[Signature]* 12/04/2019  
DATE: DIRECTOR:

PROVINCE: KEYCODES: LOCALITY No.: DISTRICT: TENDER/ CONTRACT No. CALCULATION FILE:

TYPE DRAWING

DIAGRAMME FOR DEPARTMENTAL INFORMATION

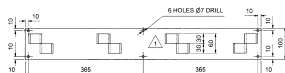
OTHER NUMBER BF 1819

SHEET  
1 OF 1

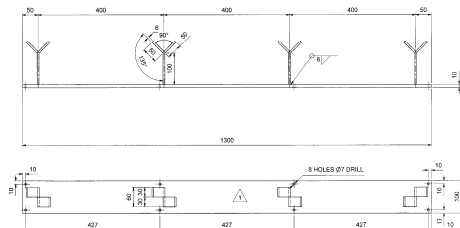
REG. No.

REV. No.

3



1 ACHOR PLATE-SIDE	
MATL: ST. STEEL	QTY: 72
MASS: $\pm 6$ (kg)	SCALE: 1:4

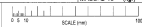
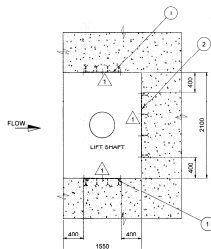
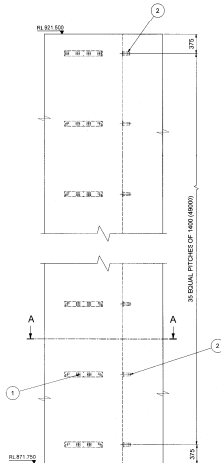


2 ANCHOR PLATE-BACK	
MATL: ST. STEEL	QTY: 36
MASS: $\pm 13$ (kg.)	SCALE: 1/4"

ALL DIMENSIONS IN MILLIMETRES

DO NOT SCALE DRAWING

REMOVE ALL SHARP EDGES

PROJECTION  
(N.O.S.)[illegible]

SECTION A-A  
SCALE: 1/2" = 1'-0"

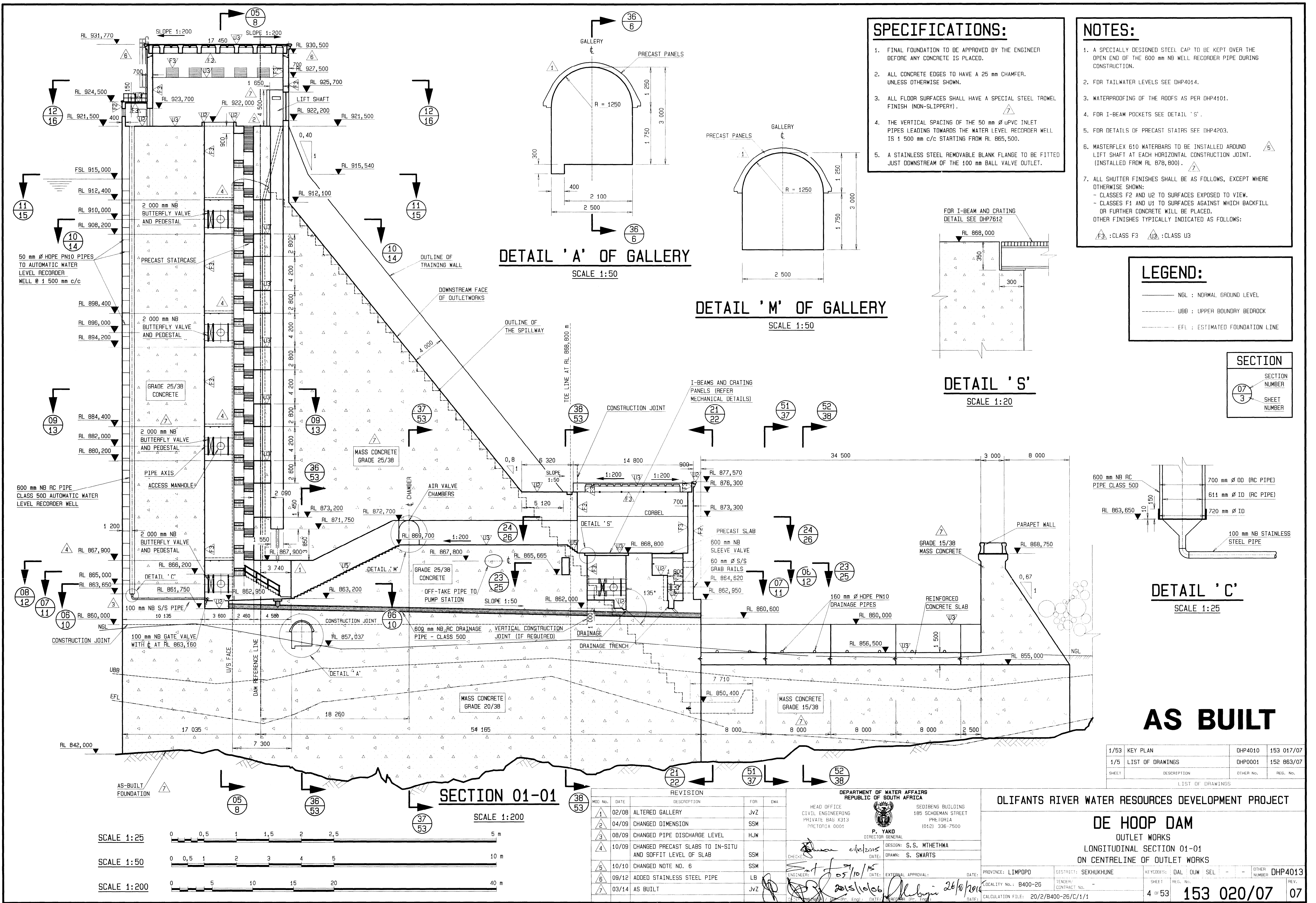
2	ANCHOR PLATE-BACK	36	ST. STEEL	DHP7668	DHP7668	
1	ANCHOR PLATE-SIDE	72	ST. STEEL	DHP7668	DHP7668	
ITEM	DESCRIPTION	QTY	MATERIAL	DETAIL DRG	ASSEMBLY DRG	REMARKS

OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT

**DE HOOP DAM**  
**PERSONNEL LIFT SHAFT**  
BUILT-IN ANCHOR PLATES  
-DETAIL C AND ASSOCIATES-

### DETAILS AND ALIGNMENT

ADDRESS	UMPOPO	STREET	SENGULINE	AIRPORT	PLY	DET	AGE	OTHER NO. 1000000	04071000
LOCALITY	UMPOPO	TERMINAL	TERMINAL	SWIFT	NO. 1	NO. 1	153554/07 ME	1	
COORDINATION FILE	20020408-26/01/10								

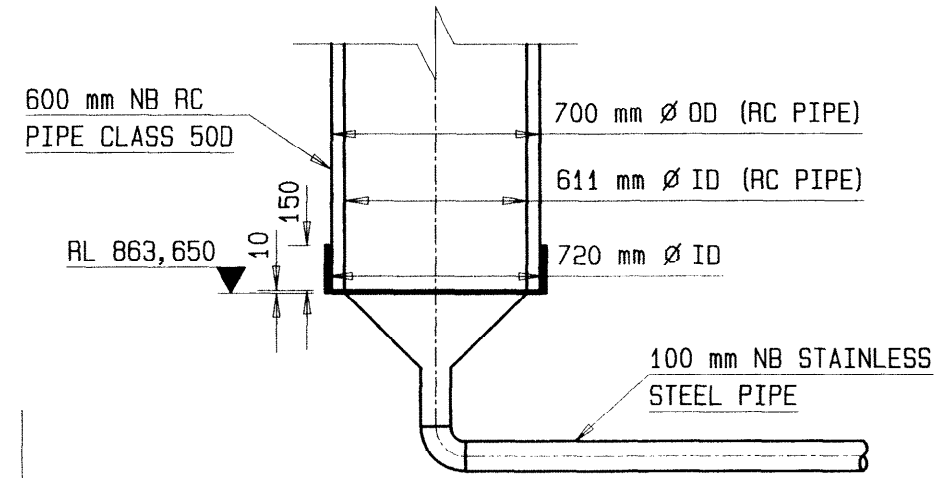


- SPECIFICATIONS:**
1. FINAL FOUNDATION TO BE APPROVED BY THE ENGINEER BEFORE ANY CONCRETE IS PLACED.
  2. ALL CONCRETE EDGES TO HAVE A 25 mm CHAMFER, UNLESS OTHERWISE SHOWN.
  3. ALL FLOOR SURFACES SHALL HAVE A SPECIAL STEEL TROWEL FINISH (NON-SLIPPERY).
  4. THE VERTICAL SPACING OF THE 50 mm Ø UPVC INLET PIPES LEADING TOWARDS THE WATER LEVEL RECORDER WELL IS 1 500 mm c/c STARTING FROM RL 865,500.
  5. A STAINLESS STEEL REMOVABLE BLANK FLANGE TO BE FITTED JUST DOWNSTREAM OF THE 100 mm BALL VALVE OUTLET.

- NOTES:**
1. A SPECIALLY DESIGNED STEEL CAP TO BE KEPT OVER THE OPEN END OF THE 600 mm NB WELL RECORDER PIPE DURING CONSTRUCTION.
  2. FOR TAILWATER LEVELS SEE DHP4014.
  3. WATERPROOFING OF THE ROOFS AS PER DHP4101.
  4. FOR I-BEAM POCKETS SEE DETAIL 'S'.
  5. FOR DETAILS OF PRECAST STAIRS SEE DHP4203.
  6. MASTERFLEX 610 WATERBARS TO BE INSTALLED AROUND LIFT SHAFT AT EACH HORIZONTAL CONSTRUCTION JOINT. (INSTALLED FROM RL 878,800).
  7. ALL SHUTTER FINISHES SHALL BE AS FOLLOWS, EXCEPT WHERE OTHERWISE SHOWN:
    - CLASSES F2 AND U2 TO SURFACES EXPOSED TO VIEW.
    - CLASSES F1 AND U1 TO SURFACES AGAINST WHICH BACKFILL OR FURTHER CONCRETE WILL BE PLACED.OTHER FINISHES TYPICALLY INDICATED AS FOLLOWS:  
F3 : CLASS F3    U3 : CLASS U3

- LEGEND:**
- NGL : NORMAL GROUND LEVEL
  - - - UBB : UPPER BOUNDARY BEDROCK
  - EFL : ESTIMATED FOUNDATION LINE

SECTION	
07	SECTION NUMBER
3	SHEET NUMBER



**DETAIL 'C'**  
SCALE 1:25

**AS BUILT**

1/53	KEY PLAN	DHP4010	153 017/07
1/5	LIST OF DRAWINGS	DHP0001	152 863/07
SHEET	DESCRIPTION	OTHER No.	REV. No.

LIST OF DRAWINGS

REVISION			
MOD. NO.	DATE	DESCRIPTION	FOR
1	02/08	ALTERED GALLERY	JvZ
2	04/09	CHANGED DIMENSION	SSM
3	08/09	CHANGED PIPE DISCHARGE LEVEL	HJW
4	10/09	CHANGED PRECAST SLABS TO IN-SITU AND SOFFIT LEVEL OF SLAB	SSM
5	10/10	CHANGED NOTE NO. 6	SSM
6	09/12	ADDED STAINLESS STEEL PIPE	LB
7	03/14	AS BUILT	JvZ

DEPARTMENT OF WATER AFFAIRS  
REPUBLIC OF SOUTH AFRICA

HEAD OFFICE  
CIVIL ENGINEERING  
PRIVATE BAG X313  
PRETORIA 0001

P. YAKO  
DIRECTOR GENERAL

DESIGN: S.S. MTHETHWA  
DATE: 05/10/15  
DRAWN: S. SWARTS

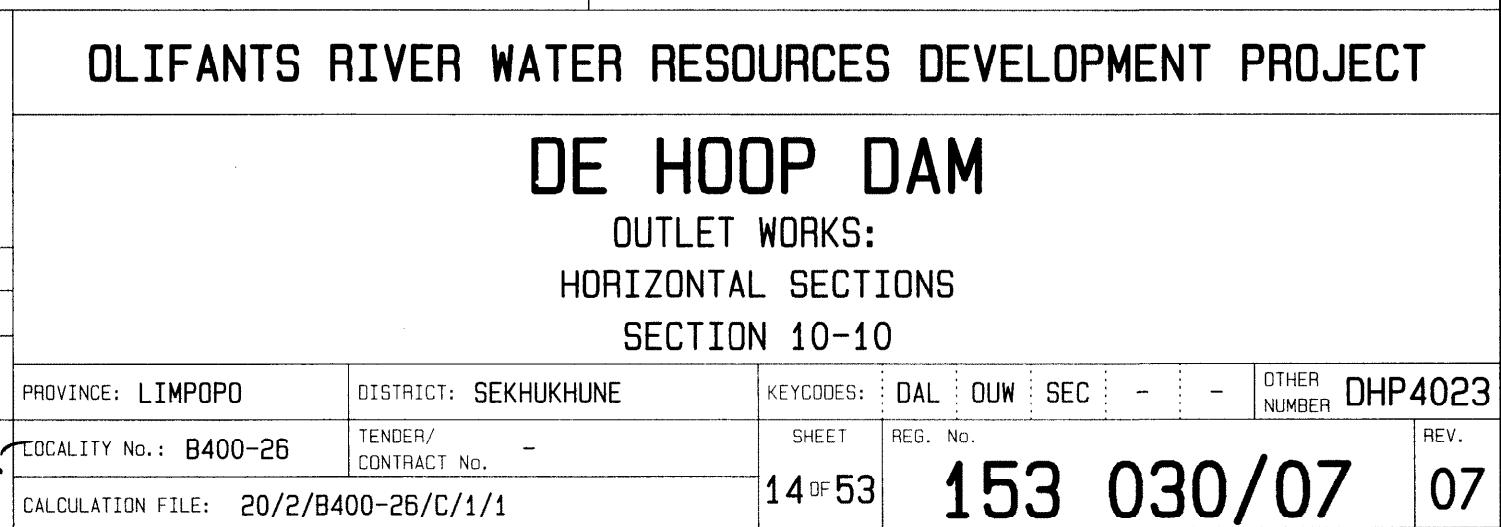
CHECKED: [Signature] DATE: 05/10/15

ENGINEER: [Signature] DATE: 20/02/2016

EXTERNAL APPROVAL: [Signature] DATE: 26/10/2016

OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT			
DE HOOP DAM			
OUTLET WORKS			
LONGITUDINAL SECTION 01-01			
ON CENTRELINE OF OUTLET WORKS			
PROVINCE: LIMPOPO	DISTRICT: SEKHUKHUNE	KEYCODES: DAL : OUW SEL : -	OTHER NUMBER DHP4013
LOCALITY No.: B400-26	TENDER/ CONTRACT No. -	SHEET 4 of 53	REV. 153 020/07
CALCULATION FILE: 20/2/B400-26/C/1/1		DATE: 20/02/2016	





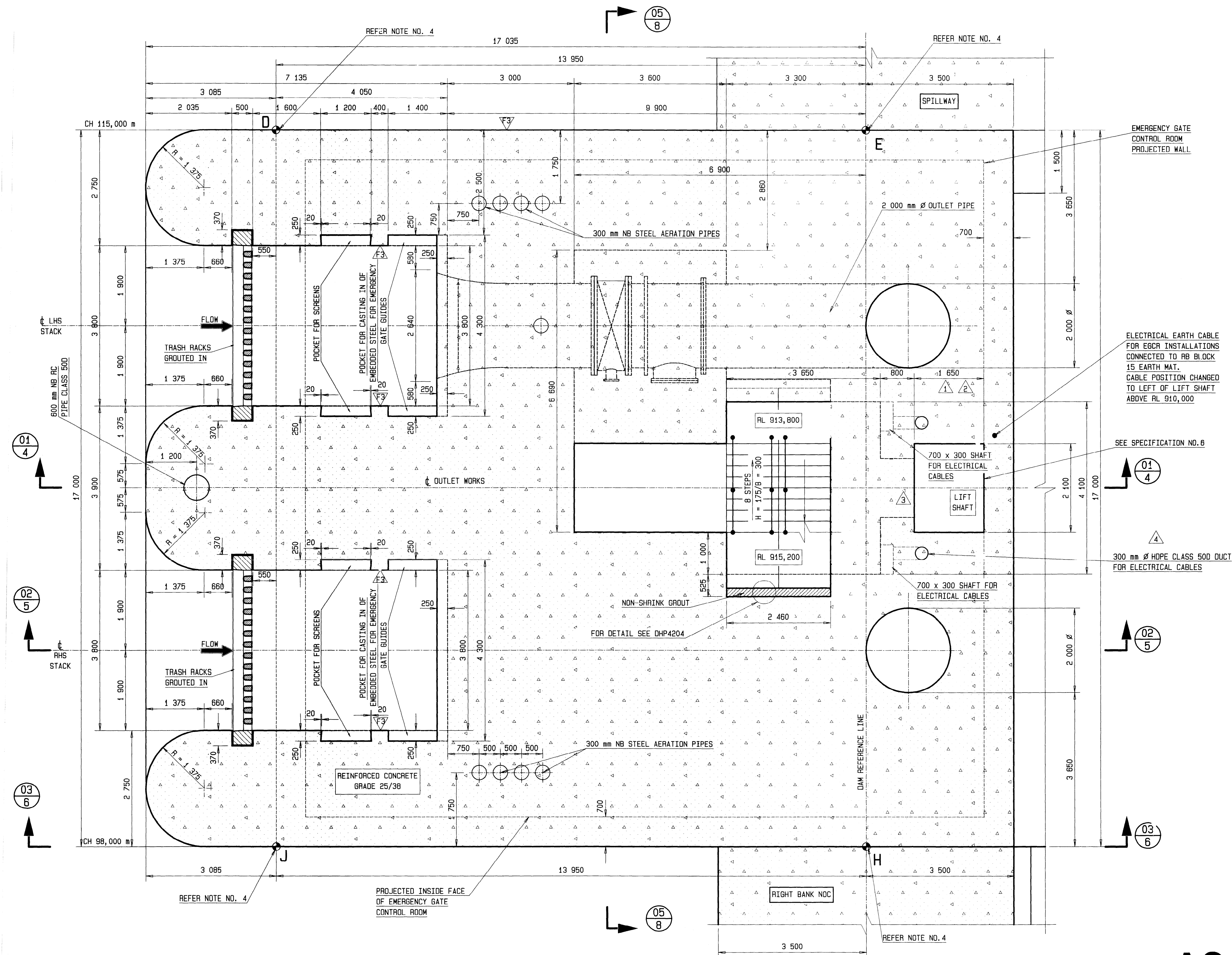


SECTION  
07  
3  
SECTION  
NUMBER  
SHEET  
NUMBER

- NOTES:**
- FOR CONCRETE SPECIFICATION SEE THE PROJECT SPECIFICATIONS.
  - FOR DETAIL OF MECHANICAL ITEMS SEE THE MECHANICAL DRAWINGS.
  - SECONDARY CONCRETE IS NOT SHOWN.
  - FOR CO-ORDINATES OF POINTS D, E, H AND J SEE DHP4004.
  - LINE THROUGH POINTS E AND H IS PERPENDICULAR TO THE AXIS OF THE OUTLET WORKS.
  - LINE THROUGH POINTS E AND H IS THE REFERENCE LINE OF THE DAM.

**SPECIFICATIONS:**

- ALL CONCRETE EDGES TO HAVE A 25 mm CHAMFER UNLESS OTHERWISE SPECIFIED.
- FLOOR SURFACES SHALL HAVE A SPECIAL STEEL TROWEL FINISH (NON-SLIPPERY).
- ALL SHUTTER FINISHES SHALL BE AS FOLLOWS, EXCEPT WHERE OTHERWISE SHOWN:  
CLASSES F2 AND U2 TO SURFACES EXPOSED VIEW  
CLASSES F1 AND U1 TO SURFACES AGAINST WHICH BACKFILL OR FURTHER CONCRETE WILL BE PLACED.  
OTHER FINISHES ARE INDICATED ON THE DRAWING TYPICALLY AS FOLLOWS:  
△ F3 : CLASS F3    △ U3 : CLASS U3
- THE VERTICAL DISTANCE BETWEEN THE 50 mm Ø HDPE PN10 INLET PIPES FOR THE WATER LEVEL RECORDER IS 1 500 mm c/c STARTING FROM RL 865,500.
- REMOVABLE BLANK FLANGE TO BE FITTED TO 150 mm VALVE OUTLET.
- THE LIFT MUST BE CAPABLE OF CARRYING A 550 kg LOAD, (7 PEOPLE), WITH A SHAFT SIZE OF 2 100 mm WIDE BY 1 650 mm DEEP, CAR SIZE OF 1 400 mm WIDE BY 1 030 mm DEEP, HEADROOM HEIGHT OF 4 050 mm, PIT DEPTH 1 450 mm, AND ODDR SIZE OF 800 mm WIDE BY 2 100 mm HIGH.



**SECTION 11-11** (RL 915,200)  
SCALE 1:50

**AS BUILT**

1/53	KEY PLAN	DHP4010	153 017/07
1/5	LIST OF DRAWINGS	DHP0001	152 863/07
SHEET	DESCRIPTION	OTHER No.	REV. No.

LIST OF DRAWINGS

OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT

**DE HOOP DAM**

OUTLET WORKS:  
HORIZONTAL SECTIONS:

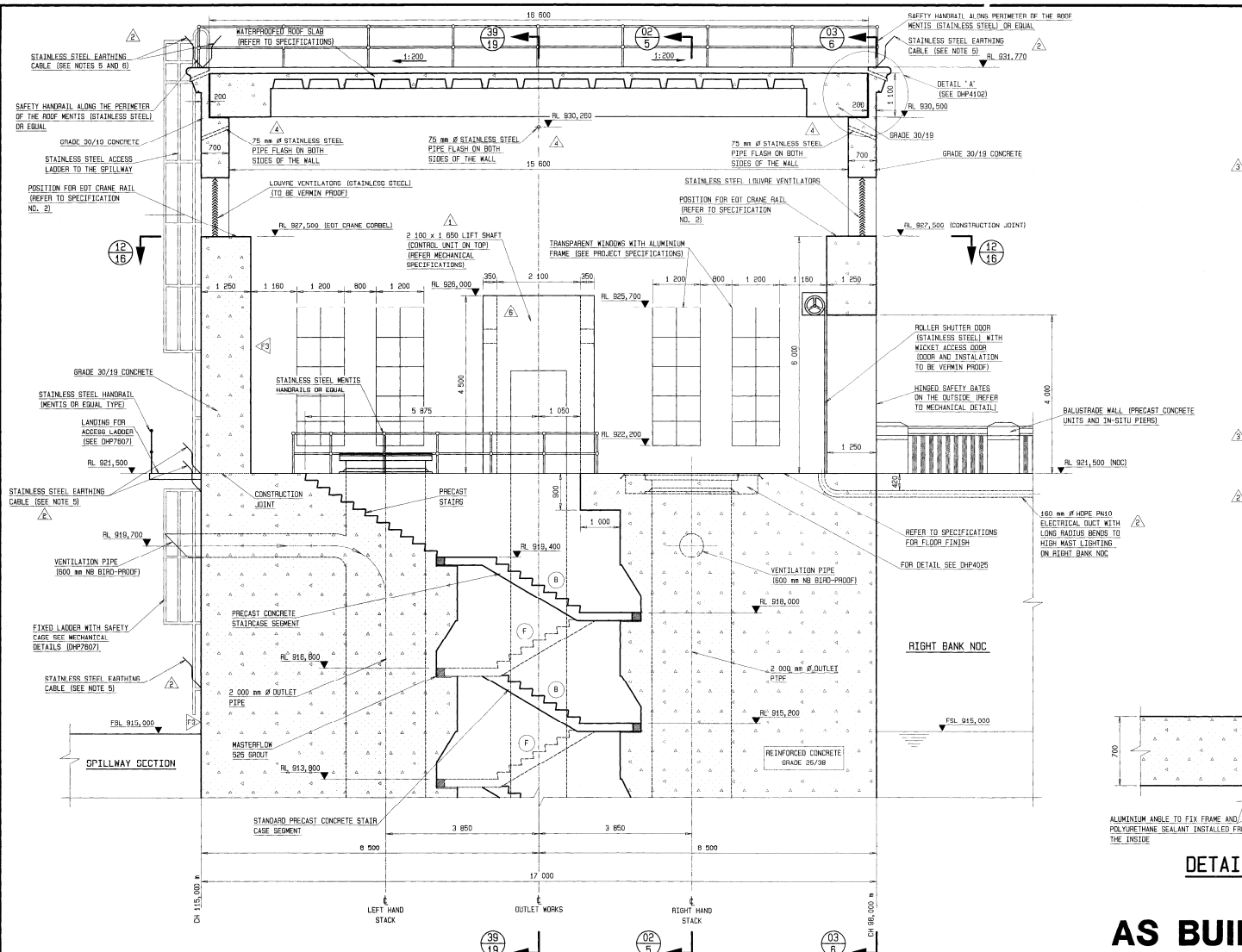
SECTION 11-11

PROVINCE: LIMPOPO	DISTRICT: SEKHUKHUNE	KEYCODES: DAL OUV SEC - - -	OTHER NUMBER DHP4024
LOCALITY No.: B400-26	TENDER/ CONTRACT No. -	SHEET 15 OF 53	REV. 153 031/07 04
CALCULATION FILE: 20/2/B400-26/C/1/1	DATE: 26/10/2015	DATE: 26/10/2015	DATE: 26/10/2015

REVISION			
MOD No.	DATE	DESCRIPTION	FOR DWA
1	02/08	ALTERED LIFT SHAFT DIMENSION	JVZ
2	04/09	CHANGED DIMENSIONS	SSM
3	11/09	ADDED ELECTRICAL DUCT	LB
4	08/15	AS-BUILT	JVZ

DEPARTMENT OF WATER AFFAIRS REPUBLIC OF SOUTH AFRICA	
HEAD OFFICE CIVIL ENGINEERING PRIVATE BAG X313 PRETORIA 0001	SEDIENG BUILDING 185 SCHOEMAN STREET PRETORIA (012) 336-7500
P. YAKO DIRECTOR GENERAL	DESIGN: S.S. MTHETHWA DATE: 05/10/2015
CHECKED: [Signature]	DRAWN: J. VAN NIEKERK
ENGINEER: [Signature]	DATE: 26/10/2015
DATE: 26/10/2015	DATE: 26/10/2015

CLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT					
<p align="center"><b>DE HOOP DAM</b>          OUTLET WORKS: INTAKE SECTION          HORIZONTAL SECTION:          SECTION 10-12</p>					
PROJECT: L10005	CURRENT: DEHOOPDAM	REVISION: 01	DATE: 08/01/00	BY: DHP	0025
LICENS. No.: 0430-08	DESIGN: CIVIL	ISS. No.	153 032/07		01
CALCULATOR P.D.: 03/2/00-03/03/01					

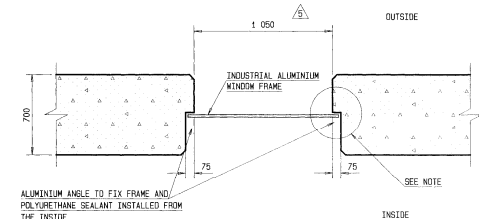


## SPECIFICATIONS:

- THE FLOOR SURFACE OF THE EMERGENCY GATE CONTROL ROOM TO BE FINISHED OFF AS FOLLOWS:
    - THE FINISHED CONCRETE RECEIVING SURFACE SHALL HAVE AN EXPOSED COARSE AGGREGATE FINISH. IF NOT, IT SHALL BE LIGHTLY ROADWORKED, AND ALL LATANCE BE REMOVED.
    - THE FLOOR SHALL BE SATURATED CURED FOR AT LEAST 24 HOURS BEFORE APPLICATION OF THE FLOOR SURFACING. ALL STANDING WATER SHALL BE REMOVED BEFORE APPLICATION.
    - THE FLOOR SURFACING AREA SHALL BE SUB DIVIDED INTO BLOCKS OF A SIZE AS PRESCRIBED BY THE SUPPLIER, WHICH WILL BE FILLED ALTERNATIVELY.
    - IMMEDIATELY BEFORE APPLICATION OF THE FLOOR SURFACING, A REMOVAL (100% AS PRESCRIBED BY THE SUPPLIER, SHAL) IF APPLIED TO THE RECEIVING SURFACE.
    - THE FLOOR SURFACING SHALL BE NOT MORE THAN 20MM THICK, AND CONSIST OF MASTERSTOP 100 OVERLAY ON EQUAL.
    - THE FINISHED SURFACE SHALL BE STEEL-FLOATED.
    - CURING TO BE DONE FOR 7 DAYS (MINIMUM).
    - FLOOR COLOUR SHALL BE LIGHT GREEN.
  - ALL SHUTTER FINISHES SHALL BE AS FOLLOWS, EXCEPT WHERE OTHERWISE SHOWN:
    - CLASSES F2 AND U2
    - TO SURFACES EXPOSED TO VIEW.
    - CLASSES F1 AND U1
    - TO SURFACES AGAINST WHICH BACKFILL OR FURTHER CONCRETE WILL BE PLACED.
- OTHER FINISHES INDICATED TYPICALLY AS FOLLOWS:
- CLASS F3 CLASS U3
- THE ROOF TO BE WATERPROOFED USING A TORCH-ON BITUMINOUS WATERPROOFING.
  - 70 mm<sup>2</sup> STAINLESS STEEL ROPE SECURED TO REINFORCING STEEL (SEE DETAIL 'H' ON DHP802) TO PROTRUDE AT LEAST 1 000 mm FROM FINAL CONCRETE FACE.
  - IDENTICAL TO NOTE 5 BUT TO BE USED FOR TELEMETRY ANTENNA.

## NOTES:

THE DETAIL WINDOW INSTALLATION PROCEDURE SHALL BE AS PER THE MECHANICAL DRAWINGS.



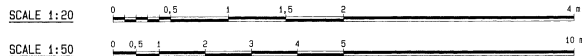
## DETAIL OF WINDOW FRAME

SCALE 1:20

**AS BUILT**

## SECTION 18-18 (SEE SHEET NO. 16)

SCALE 1:50



REV	NO.	DATE	DESCRIPTION	BY	CHK
1	04/09		CHANGED DIMENSIONS	SSM	
2	01/12		ADDED NOTE 7 AND DETAILS	LB	
3	07/12		CHANGED FLOOR SURFACE FINISH AND WATER PROOFING SPECIFICATIONS	JVZ	
4	09/12		ADDED STAINLESS STEEL PIPE	LB	
5	03/13		CHANGED DIMENSION	SSM	
6	11/13		AS BUILT	JVZ	

DEPARTMENT OF WATER AFFAIRS REPUBLIC OF SOUTH AFRICA	
HEAD OFFICE CIVIL ENGINEERING PRIVATE BAG 4333 1 VICTORIA ROAD	RESIDENTS BUILDING 105 SCHURMAN STREET PRETORIA 00121 234-7800
M. SIBENYA DIRECTOR GENERAL	DESIGN: S.S. MTHEMBA CHECK: J. VAN NIEKERSK
DATE: 10/10/15	DATE: 26/10/15
PROJECT: 18-18	PROJECT: 18-18
CONTRACT NO.: B400-26	CONTRACT NO.: B400-26
DATE: 20/2/2010	DATE: 20/2/2010

## OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT

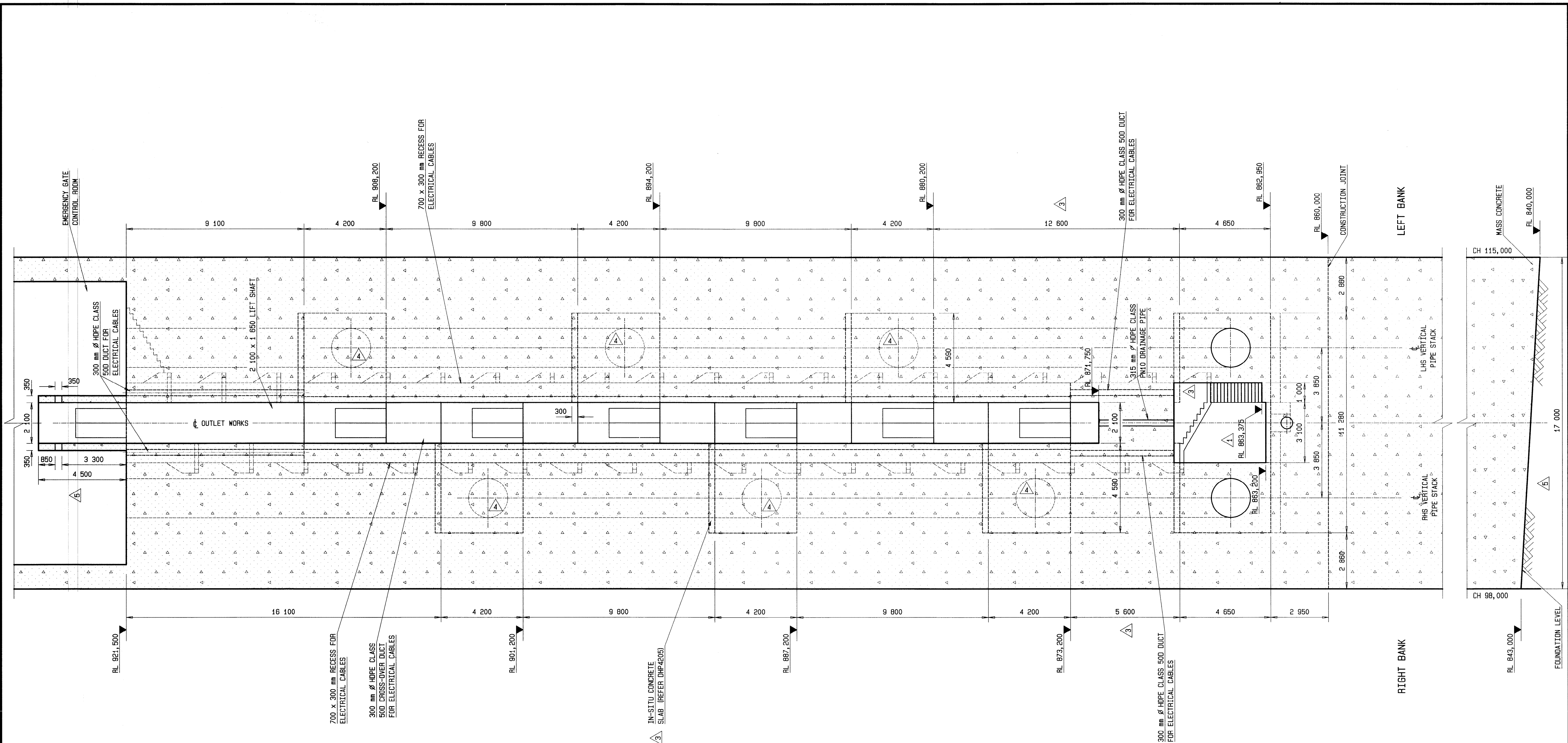
### DE HOOP DAM OUTLET WORKS: INTAKE SECTION SECTION THROUGH EMERGENCY GATE CONTROL ROOM

PROJECT: LIMPUD	DESIGNER: SEKHAKHANE	KEYWORDS: DAL, OLW, SEC	OTHER: DHP4026
PROJECT NO.: 18-18	PROJECT NO.: 18-18	PROJECT NO.: 18-18	PROJECT NO.: 18-18
PROJECT NO.: 18-18	PROJECT NO.: 18-18	PROJECT NO.: 18-18	PROJECT NO.: 18-18
PROJECT NO.: 18-18	PROJECT NO.: 18-18	PROJECT NO.: 18-18	PROJECT NO.: 18-18







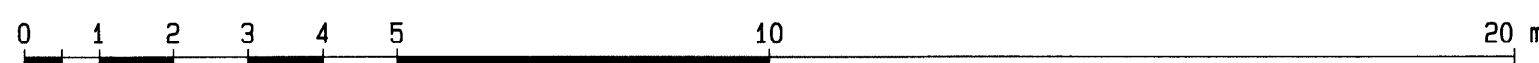


SECTION 66-66 (SEE DHP 4010)  
SCALE 1:100

AS BUILT

1/53	KEY PLAN	DHP4010	153 017/07
1/5	LIST OF DRAWINGS	DHP0001	152 863/07
SHEET	DESCRIPTION	OTHER No.	REV. No.
LIST OF DRAWINGS			

SCALE 1:100



REVISION			
MOD No.	DATE	DESCRIPTION	FOR DWA
1	03/08	ALTERED LANDING LEVEL	JVZ
2	04/09	CHANGED DIMENSIONS	SSM
3	10/09	CHANGED PRECAST SLABS TO IN-SITU AND SOFFIT LEVEL OF SLAB	SSM
4	11/09	CORRECT INLET PIPES AND ADD DUCT	JVZ
5	01/14	AS BUILT	JVZ

DEPARTMENT OF WATER AFFAIRS REPUBLIC OF SOUTH AFRICA	
HEAD OFFICE CIVIL ENGINEERING PF VATE BAG X313 PRETORIA 0001	SEDIBENG BUILDING 195 SCHOEMAN STREET PRETORIA (012) 336-7500
M. SIRENYA DIRECTOR GENERAL	
CHECKED: <i>[Signature]</i> 01/10/2015	DESIGN: G.S. MTHETHWA
ENGINEER: <i>[Signature]</i> 20/10/15	DRAWN: DRAWING SERVICES
EXTERNAL APPROVAL: <i>[Signature]</i> 26/10/2015	DATE: 26/10/2015

OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT

DE HOOP DAM

OUTLET WORKS: INTAKE SECTION  
VERTICAL SECTION THROUGH SERVICE SHAFT  
SECTION 66-66

PROVINCE: LIMPOPO	DISTRICT: SEKHUKHUNE	KEYCODES: DAL OUN SEC - -	OTHER NUMBER DHP4065
LOCALITY No.: B400-26	VENDOR/ CONTRACT No. -	SHEET 48 OF 53	REV. 05
CALCULATION FILE: 20/2/B400-26/C/1/1		153 064/07	