



**water & sanitation**

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

**BRANCH: NWRI**

**CD: INFRASTRUCTURE OPERATIONS**

**D: EASTERN OPERATIONS**

**SUB-DIRECTORATE: TECHNICAL SUPPORT SERVICES (TSS)**

## **TECHNICAL SPECIFICATION**

**HLUHLUWE DAM: REFURBISHMENT OF OUTLET WORKS PIPES  
AND VALVES**

**ADDENDUM**

**March 2016**

## TABLE OF CONTENTS

<b>TABLE OF CONTENTS .....</b>	<b>ii</b>
1. Introduction.....	3
2. Isolation .....	3
3. Supply of the new 600mm NB butterfly valve .....	4
3.1 Details of the butterfly valve .....	4
3.2 Electrical installation to the butterfly valve .....	5
3.3 Cabling .....	5
4 Load testing of 5 metric ton crane in outlet tower .....	5

## 1. Introduction

Following the site meeting held of 15 the November 2016 at 11h00 at Hluhluwe dam there was a number of items that required clarification. The queries raised at the dam regarding technical matters will be addressed in the Addendum.

## 2. Isolation

Two items were identified and discussed on the day of the site meeting in terms of the isolation of the lines during the project:

- The original specification called for the DWS to provide diving services to isolate the left hand domestic and industrial line during the refurbishment of the line upstream of the newly installed butterfly valve. The DWS Diving Term contract has lapsed and the diving services are now required to be included in the scope of work of the project. Details of the diving operation is thus required and addressed in the addendum. Refer to Paragraph 2.1 (**Pricing Schedule: Section B**)
- The provision of a coffer facility to of the stilling basin downs stream of the large sleeve valves to enable the removal, installation and the corrosion protection of the lines on the downstream side of the outlet control room. Refer to Paragraph 2.2 (**Pricing Schedule: Section B**)

### 2.1 Diving operation and Isolation of left hand Domestic and Industrial line

Isolate the line by installing the service gate with the 5 metric ton overhead crane in the tower and do lockout with DWS Operational personnel and Project Manager. Sealing of the service gate may be required using a diving company. The diving company will be appointed by the Contractor.

Diving to isolate the upper level (Domestic and Industrial outlet line) is required to seal the service gate sufficiently to allow the corrosion protection of the pipeline upstream of the butterfly valve.

The load testing of the 5 metric ton crane in the outlet tower will thus be part of the scope of work to ensure legal compliance before use. Refer to Paragraph 4.

Diving operations will take place from the outlet tower. Access to the tower is from the left bank. Access from the left bank to the Non Overspill Crest level is via a number of steps and will complicate the transport of diving equipment to the tower. Diving will be done from the Non Overspill Crest level. Access from the Non Overspill Crest level to the water level may be considerable and need to be taken into account.

The intermediate domestic and industrial line outlet is at **RL 200 ft (60.96m)**.

The full supply level is at **RL 265 ft (80.77m)**. (Dam full to spillway level)

The Non Overspill Crest is at **RL 279.5 ft (85.19m)**

All diving work will comply with Occupational Safety Act, Act 85 of 1993 and in particular the Diving Regulations. The lead time for the procurement of diving services is required and may delay work.

For tender purposes, the cost for the diving services will be priced as a provisional sum plus 10% mark-up. The provisional sum plus mark-up will be used during tender evaluation. The contractor needs to obtain provisional price from a Diving company based on travel to site,

site establishment, one day diving, site de establishment, travel from site. Two diving trips are allowed for in the bill of quantities. Sealing the service gate and assisting to remove/ recover the service gate. The claim for the diving will be on actual cost plus 10% and not the provisional sum.

All diving work will comply with Occupational Safety Act, Act 85 of 1993 and in particular the Diving Regulations. The lead time for the procurement of diving services is required and may delay work. **(Pricing Schedule: Section D )**.

## **2.2 Provision of coffer facility for isolation at the bottom sleeve valves**

During the removal of the bottom sleeve valves, the corrosion protection of the bottom lines downs stream of the outlet control structure and the installation of the sleeve valves, the water level at the sleeve valves need to be lowered.

DWS will assist with a temporary shutdown to assist with the installation of an isolation system. The contractor shall install and maintain the required water barrier that is deemed necessary to serve as a coffer dam. The barrier may be of metal design, sand bags, inflatable water tubes, etc that the contractor may consider adequate to retain the water level at the sleeve valves during the removal of the bottom sleeve valves, the corrosion protection of the bottom lines downstream of the outlet control structure and the installation of the sleeve valves.

It should be noted that the level of the water within the stilling basin may rise substantially should the dam spill. This may cause breaching of coffer facility.

DWS endeavour to maintain the lowest possible water level that operational requirements allow.

## **3. Supply of the new 600mm NB butterfly valve**

The **Pricing Schedule Section L : Replacement Of 1 Off 600 mm NB Ringfollower Valve** covers the replacement of the 600mm NB ringfollower valve and supply of the 600mm NB butterfly valve, actuator and cabling

### **3.1 Details of the butterfly valve**

Remove 1 off 600mm ring follower valve and replace with a 600mm butterfly valve as per DWS 2510 and DWS 9900. The valve shall be supplied with a gearbox and electrical actuator. The valve shall only be operated locally via the actuator.

The valve shall be installed on the 600mm line with the gearbox and actuator mounted on the left hand side of the valve (facing downstream).

The actuator shall conform to DWS 2510.2 Auxiliary Drive Specification and in particular to Part 3 detailing Electrical Actuators.

The valve flange drilling will need to remain the same as per the original installation being a BS10 Table D. (PCD = 29 ¾" , 16 Holes drilled 1 ¼" with 1 " bolts. – to be confirmed on site.)

**(Pricing Schedule: Section L)**

### **3.2 Electrical installation to the butterfly valve**

The electrical supply shall be from the main Distribution Board at the main entrance to the outlet control room. Cable racks and cabling shall follow the upstream wall and then mounted on the right hand wall to the position of the new butterfly valve.

### **3.3 Cabling**

The cabling system to the butterfly valve shall be neatly routed and enclosed in stainless steel cable trays securely fixed to the outlet control room wall. Brackets, fasteners and cable tie-down straps shall also be of non-corrosive materials.

All cable connections shall be protected in accordance with IP 65 of SANS 60 529, supported and sealed by means of a stainless steel gland. A suitably sized rubber shroud shall be installed over all glands. The armouring shall be clamped between substantial tapered sections that form an integral part of the gland. Cables shall as far as possible enter connection boxes at the bottom.

## **4 Load testing of 5 metric ton crane in outlet tower**

The load testing of the 5 metric ton overhead crane in the tower forms part of the scope of work. See pricing Schedule: Paragraph C: Load Testing.

The service and load testing shall be done by a suitably qualified institution as required by the OHS Act and ECSA.

- **“Lifting Machinery Entity (LME)”** means a legal entity approved and registered by the Department of Labour;
- **“Lifting Machinery Inspector (LMI)”** means a person registered by the Engineering Council of South Africa in terms of the Engineering Profession Act, 2000 (Act 46 of 2000) as amended;

Load test certificates for the equipment shall be issued to the DWS as part of the scope. Invoices shall not be accepted if the abovementioned certificates have not been issued to the DWS.

Any modification, refurbishment and marking required will also be part of the scope of work. Proposed modifications shall be submitted to the DWS for approval.

All load testing equipment(s) required to execute the load testing shall be supplied by the contractor and the LME ie. The water bag, water pump and measuring equipment.