

NORTHERN WWTW Electro-Mechanical Refurbishment of Unit 3 BIOREACTORS 1&2

SUMMARY OF WORKS	
Type of Works	Waste Water Treatment works
Location of Works	Diepsloot, Johannesburg
Size of Works (Mℓ/D)	500 ML/D
Date of Award	26 May 2016
Date of Completion	24 October 2018
Completion Value (Including VAT)	R 42 356 843.72
Client	Johannesburg Water
Conditions of Contract	GCC 2010 Second Edition

INTRODUCTION

Part of the **Mechanical Equipment** scope of work at Northern WWTW included refurbishment of Unit 3, Module 1 and 3 biological reactors as well as the balancing tank

BALANCING TANK



Balancing Tank

Vertical Shaft Mixers

- Remove the balancing tanks vertical shaft mixers from their platforms,
- Decommission and store the drive motors, couplings and gearboxes from the disassembled mixer,
- Supply, deliver, store (if necessary), install and commission new two speed drive motors, couplings and gearboxes to replace the decommissioned drive units,
- Inspect and refurbish balancing tank mixer shafts and impellers on existing,
- Remove all mounting bases from mixer platform bridges,
- Inspect and reinstall the holding down bolts, if in acceptable condition
- Design, supply, deliver, store (if necessary), and install new mounting base plates compatible with existing holding down bolts for vertical shaft mixers.

Paterson Candy International (SA) (Pty) Ltd, trading as PCI Africa

T +27 11 794 5004

11 Ridge Road, Laser Park, Honeydew, 2170 | PO Box 308, Northriding, 2162

Reg no: 1953/001821/07

www.pciafrica.com

Directors: MJ Hughes, CO Azih, G Burton-Durham

BIOREACTOR



Bioreactor

The scope of work for Unit 3 bioreactor 1 and 3 is a duplicate of each other, i.e. the same work is required for both the bioreactors. Replacements and Refurbishment required for each of Unit 3 Bioreactor 1 & 3 are as follows:

Vertical Shaft Mixers

- Remove the 9 x bioreactor vertical shaft mixers from the mounting bases,
- Decommission and store the drive motors, couplings and gearboxes from the mixer assemblies,
- Supply, deliver, store (if necessary), install and commission new single speed drive motors, gearboxes and couplings to replace the decommissioned mixer drive units,
- Inspect the mixer shafts and impellers for physical damages and refurbish all for reinstallation,
- Remove all mounting bases from mixer platform bridges,
- Inspect the holding down bolts for fatigue and physical damage,
- Design, supply, deliver, store (if necessary), and install new mounting base plates compatible with existing holding down bolts for vertical shaft mixers, and
- Reinstall the holding down bolts and new base plates for mixer mounting.

Surface Aerators



Old Surface Aerators (To be replaced)

- Remove all the surface mounted aerators from the bioreactor,
- Decommission the drive units (motor, couplings and gearboxes) from the aerator assemblies,

- Supply, deliver, store (if required by the Client), install and commission new single speed drive motors, gearboxes and couplings to replace the decommissioned high, medium and low aeration drive units,
- Inspect the aerator shafts and turbines for physical damages then repaint and reinstall equipment,
- Remove all mounting bases from aerator platform bridges,
- Inspect and reinstall the holding down bolts, and
- Design, supply, deliver, store (if necessary), and install new mounting base plates compatible with the holding down bolts for the various surface mounted aerators.
- Reinstall the holding down bolts and new base plates for aerator mounting.

Recycle Pumps

The scope of work for the Recycle Pumps will be the same on both the bioreactors.

- Remove the axial flow recycle pumps from the bioreactor,
- Decommission (and store) the existing drive units and V-Belts,
- Supply, deliver, and store (if necessary), new drive motors and V-Belts for the recycle pumps,
- Refurbish the A- and B-Recycle pump shafts, impellers, etc.
- Replace all fasteners, bearings, wear rings and seals,
- Reinstall fully refurbished A- and B-Recycle pumps to original positions.

Archimedean Screw Pumps



Screw Pumps

- Remove the bioreactor screw pumps from the screw pumping station,
- Decommission the screw pump drive motors, couplings and gearboxes,
- Supply, deliver (and store if necessary) and install new screw pump drive units,
- Remove and replace screw pump top and bottom bearings with new ones,
- Refurbish the Archimedean screw pump bodies by in situ shot blasting and recoat for corrosion protection,
- Construct new drive unit plinths for the Archimedean screw pumps,
- Do in situ refurbishments of the Archimedean screw pump trough, if required.

CIVIL INFRASTRUCTURE

Isolate and drain the balancing tanks. Remove and dispose of grit. Clean and return to service.

ELECTRICAL EQUIPMENT



One of the items for electrical refurb

Replace selected buckets within the existing MCC"s (i.e. refurbish and upgrade MCC"s)
Contract JW 13601 Northern Wastewater Treatment Works Electro-Mechanical Refurbishment of Unit 3
Bioreactors 1 and 3 Volume 2 Tender and Contract
Scope of Work SW.7

CONTROL AND INSTRUMENTATION

- Replace existing settled sewage flow meters
- Supply and install dissolved oxygen sensors
- Supply and install suspended solids meters
- Replace sump level switches.
- PLC & SCADA Programming to integrate new equipment and instrumentation.

The Contract was awarded to PCI in July 2015 and completion envisaged August 2019.

The contract sum was approximately R 42 000 000.00