

TENDER NO. 85Q/2016/17



CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

SCM - 511

Approved by SCM Director: 29/ 10/ 2014

Version: 1

Page 1 of 119

CONTRACT DOCUMENT

FOR THE

**DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS
FOR THE CONSTRUCTION OF PRIMARY TREATMENT AND
SLUDGE HANDLING FACILITIES AT ZANDVLIT WASTEWATER
TREATMENT WORKS**

VOLUME 2B

(RETURNABLE DOCUMENT)

(THIS DOCUMENT MAY BE COMPLETED ELECTRONICALLY. IT MUST STILL BE
PRINTED OUT AND SUBMITTED AS A HARD COPY. EACH PAGE MUST STILL BE
SIGNED).

CITY OF CAPE TOWN

05 DEC 2016

TECHNICAL DATA SHEETS

SUPPLY CHAIN MANAGEMENT

ISSUED BY:

COMPILED BY:

**DIRECTOR: WATER AND
SANITATION
CITY OF CAPE TOWN
Tower Block, Civic Centre
12 Hertzog Boulevard
CAPE TOWN
8001**

FOR OFFICIAL USE.

Tender Serial No.:

**Signatures of City Officials at Tender
Opening**

1.

2.

3.

OCTOBER 2016

**NAME OF TENDERING
ENTITY**

*PLEASE REFER TO SEPARATE DATA SHEET FILE FOR
COMPLETED DATA SHEETS.*

CITY OF CAPE TOWN

WATER AND SANITATION

CONTRACT NO. 85Q/2016/17

**DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE CONSTRUCTION OF
PRIMARY TREATMENT AND SLUDGE HANDLING FACILITIES AT ZANDVLIT WASTEWATER
TREATMENT WORKS**

General Tender Information

This Volume 2B constitutes the Technical Data Sheets which form part of Part T2.2 Returnable Schedules.
This volume is part of the Returnable Document.

This Volume 2B contains 119 pages numbered i to iv and 1 to 115 in consecutive order.

CITY OF CAPE TOWN

WATER AND SANITATION

CONTRACT NO. 85Q/2016/17

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE CONSTRUCTION OF
PRIMARY TREATMENT AND SLUDGE HANDLING FACILITIES AT ZANDVLIT WASTEWATER
TREATMENT WORKS

Technical Data Sheets

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Note: By signing this page, the tenderer acknowledges all equipment will be supplied in accordance with the completed data sheets and all equipment is fully in accordance with the specification, unless specifically stated otherwise.

Tenderer

Signature

Date

.....

.....

.....

16/11/2016

CITY OF CAPE TOWN

WATER AND SANITATION

CONTRACT NO. 85Q/2016/17

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE CONSTRUCTION OF
PRIMARY TREATMENT AND SLUDGE HANDLING FACILITIES AT ZANDVLIET WASTEWATER
TREATMENT WORKS

SECTION 1

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TECHNICAL DATA SHEET No.1: SLUICE GATES (WALL-MOUNTED)

Description	Specified	Offered
SLUICE GATES		
Make and model		
Material of frame and door	EN Grade 1.4401 (316)	
Material of seals	Neoprene or EPDM	
Material of thrust nut	Non-ferrous alloy / polymer / elastomer	
Material of rising spindle	EN Grade 1.4401 (316)	
Material of guides	Non-ferrous alloy / polymer / elastomer	
Material of spindle cover	EN Grade 1.4401 (316) or Clear PVC	
Material of fasteners	EN Grade 1.4401 (316)	
Recess requirements		
Country of manufacture		
ACTUATOR		
Make and model		
Motor rating (kW)		
Max. available operating torque (N.m)		
Max. proposed operating torque in this application (N.m)		
Material of construction		
Corrosion protection		

	Unit	Diversion Chamber	Inlet Works By-pass Chamber			Sewer Inlets	Upstream of trash rack screens	Downstream of trash rack screens	Upstream of Lower Screw Pump Station Pumps	Inlet Works Overflow Chamber	Upstream of Upper Screw Pump Station Pumps	PST Outlet Channels	CAS A & B Inlet
		CS-0020	Inlet	Recirculation	Outfall	CS-0050	CS-0050	CS-0050	CS-0050	CS-0060	CS-0055	CS-0080	CS-0120
Drawing Number (first in series)													
Number of gates	No												
Max head when gate closed	mm												
Max unbalanced head against which gate will operate	mm												
Height of operating gear and wheel above datum	mm												
Gate diameter / size of opening	mm				700								
Height of gate	mm												
Gate travel	mm												
Gate seating / off seating													
Maximum torque required to open or close gate at maximum head	Nm												

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.2: SLUICE GATES (CHANNEL-MOUNTED)

Description	Specified	Offered
SLUICE GATES		
Make and model		
Material of frame and door	EN Grade 1.4401 (316)	
Material of seals	Neoprene or EPDM	
Material of thrust nut	Non-ferrous alloy / polymer / elastomer	
Material of rising spindle	EN Grade 1.4401 (316)	
Material of guides	Non-ferrous alloy / polymer / elastomer	
Material of spindle cover	EN Grade 1.4401 (316) or Clear PVC	
Material of fasteners	EN Grade 1.4401 (316)	
Channel invert recess requirements		
Country of manufacture		
ACTUATOR		
Make and model		
Motor rating (kW)		
Max. available operating torque (N.m)		
Max. proposed operating torque in this application (N.m)		
Material of construction		
Corrosion protection		

Detail/Requirements	Unit	Upstream of mechanical front raked screens	Downstream of perforated plate screens	Upstream of degritters	Downstream of degritters	PST Flow Splitter
Drawing Number (first in series)		CS-0060	CS-0060	CS-0060	CS-0060	CS-0076
Number of gates	No					
Max head when gate closed	mm					
Max unbalanced head against which gate will operate	mm					
Height of operating gear (handwheel) above platform	mm					
Diameter / size of opening	mm					
Height of gate	mm					
Gate travel	mm					
On-seating / off seating						
Maximum torque required to open or close gate at maximum head	Nm					

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No. 3: SUBMERSIBLE PUMP FOR EXISTING LOWER SCREW
PUMP STATION**

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /s)	0.924 m ³ /s	
Pressure at duty point (m)	17.9 m	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)	> 75%	
Pump best efficiency point (%)	> 80%	
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Maximum diameter of solid object that can be pumped (mm)	> 100 mm	
Material of impeller	Close-grained cast iron	
Material of pump casing	Close-grained cast iron	
Corrosion protection (internal)		
Material of shaft	Stainless steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 4: TRASH RACK SCREEN (LOWER SCREW PUMP STATION)

Description	Specified	Offered
Make and model		
Aperture	150 mm	
Operating range of unit, water flow (m ³ /s)	0.69 – 1.74	
Operating range of unit, screenings (kg/hr)		
Operating width of screen field (mm)		
Operating height of screen field (mm)		
Overall width of frame at level of screen field (mm)		
Overall height (mm above top of channel)		
Discharge level (mm above top of channel)		
Overall length (mm)		
Material of frame	EN Grade 1.4401 (316)	
Material of screen field	EN Grade 1.4401 (316)	
Material of rake assembly	EN Grade 1.4401 (316)	
Material of rake comb	EN Grade 1.4401 (316)	
Material of chain	EN Grade 1.4401 (316)	
Material of chain guides	EN Grade 1.4401 (316)	
Material of sprockets	EN Grade 1.4401 (316)	
Material of wiper assembly	EN Grade 1.4401 (316)	
Material of wiper blade	HDPE	
Make and model of motor		
Rated motor power (kW)		
Make and model of gearbox		
Gearbox rating		
Gearbox service factor	2.5	
Overall mass of unit (kg)		
Country of manufacture		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 5: CONVEYOR BELT (LOWER SCREW PUMP STATION)

Description	Specified	Offered
Make and model		
Belt width (mm)		
Belt length (mm)		
Take-up length (mm)		
Conveyor overall dimensions (mm x mm x mm)		
Idler type		
Idler angle		
Rated motor power (kW)		
Gearbox service factor	> 2	
Material of belt		
Material of idlers		
Material of belt scraper		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 6: LIFTING EQUIPMENT (LOWER SCREW PUMP STATION)

Description	Specified	Offered
Safe Working Load (kg)	Max load + 25%	
Maximum load for this application (kg)		
Test Load (kg)		
Standard used for design of structure		
Grade of steel for structure		
Corrosion protection		
Hoist make and model		
Hoist rated motor power (kW)		
Hoist gearbox service factor	> 2	
Crawl trolley make and model		
Crawl trolley rated motor power (kW)		
Crawl trolley gearbox service factor	> 2	
End carriages make and model		
End carriages rated motor power (kW)		
End carriages gearbox service factor	> 2	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 7: ARCHIMEDES SCREW PUMP (LOWER SCREW PUMP STATION)

Description	Specified	Offered
Make and model		
Country of manufacture		
Flow range (m ³ /s)	0.69-1.39	
Maximum design lift (m)		
Screw angle of inclination (degrees)		
Efficiency at maximum design flow (%)		
Shaft power required (kW)		
Motor rated power (kW)		
Gearbox make and model		
Gearbox type		
Gearbox service factor	> 2	
Scroll diameter (mm)		
Tube diameter (mm)		
Maximum tensile stress in tube (MPa)	20 MPa	
Maximum deflection under self-load and in operation (mm)	As per spec	
Central tube wall thickness (mm)		
Scroll flight thickness (mm)		
Number of flights		
Material of tube	Structural carbon steel	
Material of scroll flights	Structural carbon steel	
Material for tips of scroll flight	EN Grade 1.4401 (316)	
Corrosion protection of screw	As per spec	
Make and model of shaft coupling		
Power rating of shaft coupling (kW)		
Speed rating of shaft coupling (rpm)		
Torque rating of shaft coupling (Nm)		
Mass of rotating assembly (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 8: FRONT RAKED MECHANICAL SCREEN (INLET WORKS)

Description	Specified	Offered
Make and model		
Aperture	25 mm	
Operating range of unit, water flow (m³/s)	0.417 – 1.04	
Maximum headloss at 50% blinded	400 mm	
Screenings Capture Ration	75 %	
Operating range of unit, screenings (kg/hr)		
Operating width of screen field (mm)		
Operating height of screen field (mm)		
Overall width of frame at level of screen field (mm)		
Overall height (mm above top of channel)		
Discharge level (mm above top of channel)		
Overall length (mm)		
Material of frame	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of screen field	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of rake assembly	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of rake comb	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of chain	Manufacturer's standard	
Material of chain guides	Manufacturer's standard	
Material of sprockets	Manufacturer's standard	
Material of wiper assembly	Manufacturer's standard	
Material of wiper blade	HDPE	
Make and model of motor		
Rated motor power (kW)		
Make and model of gearbox		
Gearbox rating		

Description	Specified	Offered
Gearbox service factor	2 or higher	
Overall mass of unit (kg)		
Country of manufacture		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 9: PERFORATED PLATE SCREEN (INLET WORKS)

Description	Specified	Offered
Make and model		
Aperture	6 mm	
Operating range of unit, water flow (m ³ /s)	0.417 – 1.04	
Maximum headloss at 50% blinded	400 mm	
Screenings Capture Ration	75 %	
Operating range of unit, screenings (kg/hr)		
Operating width of screen field (mm)		
Operating height of screen field (mm)		
Overall width of frame at level of screen field (mm)		
Overall height (mm above top of channel)		
Discharge level (mm above top of channel)		
Overall length (mm)		
Material of frame	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of screen field	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of rake assembly	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of rake comb	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of chain	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of chain guides	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of sprockets	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of wiper assembly	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of wiper blade	HDPE	
Make and model of motor		
Rated motor power (kW)		

Description	Specified	Offered
Make and model of gearbox		
Gearbox rating		
Gearbox service factor	1.8 or higher	
Overall mass of unit (kg)		
Country of manufacture		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No. 10: WATER LAUNDER CONVEYORS (COARSE SCREENINGS) –
INLET WORKS**

Description	Specified	Offered
Make and model		
Operating range of unit, water flow (m ³ /s)	0.417 – 1.04	
Nominal diameter of trough (mm)		
Nominal height of trough (mm)		
Trough cover material	EN Grade 1.4401 (316)	
Angle of inclination		
Actuated valve type and size		
Wash water requirements (pressure and flow)		
Material of trough	EN Grade 1.4401 (316)	
Material of supports	EN Grade 1.4401 (316)	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No. 11: WATER LAUNDER CONVEYORS (FINE SCREENINGS) –
INLET WORKS**

Description	Specified	Offered
Make and model		
Operating range of unit, water flow (m ³ /s)	0.417 – 1.04	
Nominal diameter of trough (mm)		
Nominal height of trough (mm)		
Trough cover material	EN Grade 1.4401 (316)	
Angle of inclination		
Actuated valve type and size		
Wash water requirements (pressure and flow)		
Material of trough	EN Grade 1.4401 (316)	
Material of supports	EN Grade 1.4401 (316)	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.12: WASHER COMPACTOR (COARSE SCREENINGS) – INLET WORKS

Description	Specified	Offered
Make and model		
Operating capacity (m ³ /hr)	6	
Overall dimensions		
Rated motor power for washer (kW)		
Rated motor power for compactor (kW)		
Material of body, discharge chute and support legs	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of screw		
Material of wearing surfaces		
Required wash water (flow and pressure)		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.13: WASHER COMPACTOR (FINE SCREENINGS) – INLET WORKS

Description	Specified	Offered
Make and model		
Operating capacity (m ³ /hr)	6	
Overall dimensions		
Rated motor power for washer (kW)		
Rated motor power for compactor (kW)		
Material of body, discharge chute and support legs	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Material of screw		
Material of wearing surfaces		
Required wash water (flow and pressure)		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.14: SKIP DOLLY (SCREENINGS)

Description	Specified	Offered
Material of construction	HDG Mild Steel	
Wheel Material		
Rated motor power		
Gearbox Service Factor (if applicable)		
Operating Speed (m/min)	6	
Size of skip to be housed	6 m ³	
Number of skips to be housed	4	
Total Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.15: LIFTING EQUIPMENT – INLET WORKS SCREENS

Description	Specified	Offered
Safe Working Load (kg)	Max load + 25%	
Maximum load for this application (kg)		
Test Load (kg)		
Standard used for design of structure		
Grade of steel for structure		
Corrosion protection		
Hoist make and model		
Hoist rated motor power (kW)		
Hoist gearbox service factor	> 2	
Crawl trolley make and model		
Crawl trolley rated motor power (kW)		
Crawl trolley gearbox service factor	> 2	
End carriages make and model		
End carriages rated motor power (kW)		
End carriages gearbox service factor	> 2	
Hoist chain/cable safety factor	At least 6	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.16: ODOUR CONTROL – INLET WORKS

Description	Specified	Offered
BIOTRICKLING SCRUBBER		
Make and model		
Treatment flow capacity (m ³ /h)	25 035	
Volume of media (m ³)		
Overall dimensions		
Footprint (mm x mm)		
Material of tank construction		
Nutrients to be added to system (if applicable)		
Recirculation pump make & model		
Recirculation pump rated kW		
Recirculation pump flow rate and pressure		
Empty Bed Residence Time (seconds)		
Service life of media at average H ₂ S load (years)		
Daily water requirements (litres)		
System dry mass (kg)		
System operation mass, wet (kg)		
ODOUR CONTROL FAN		
Make and model		
Pressure and flow at duty point		
Power required at duty point (kW)		
Rated motor power (kW)		
Material of casing		
Material of blade		
Fan mass (kg)		
CHANNEL COVERS		
Material used (outer and inner)		
Overall thickness of cover (mm)		
Maximum load for walk-on covers (kg)		
UV resistant	Yes	
Anti-slip	Yes	

TECHNICAL DATA SHEET No.17: SERVICE WATER PUMPS – INLET WORKS

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h)	144	
Pressure at duty point (m)	65	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless steel (if in contact with fluid)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.18: VORTEX DE-GRITTING SYSTEM (GRIT REMOVAL)

Description	Specified	Offered
Make and model		
Grit removal efficiency	95% of the grit down to 140-mesh (106 microns) in particle size	
Rated motor power of grit fluidizer (kW)		
Material of fluidizer		
Corrosion protection on fluidizer		
Grit removal pump make and model		
Grit pump flow rate and pressure		
Rated motor power of grit pump (kW)		
Efficiency of grit pump at duty point (%)		
Pump casing material		
Pump impeller material		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.19: GRIT CLASSIFIER

Description	Specified	Offered
Make and model		
Integrated washing (YES/NO)		
Maximum possible feed rate (t/s)	25	
Maximum possible dry material (m ³ /h)	0.5	
Separation efficiency (%) and particle size)	95%	
Overall dimensions		
Construction Material - Body	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Construction Material – Frame		
Construction Material – Supports		
Construction Material – Screw / Spiral		
Construction Material – Shaft		
Construction Material - Lining		
Drive motor make and model		
Rated motor power (kW)		
Motor Output Torque (N.m)		
Gearbox make and model		
Gearbox service factor		
Gearbox Output Speed (rpm)		
Gearbox output torque (N.m)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.20: PARSHALL FLUME – INLET WORKS

Description	Specified	Offered
Manufacturer		
Size		
Flow range (m ³ /s)	<i>As per spec</i>	
Throat width (mm)	<i>As per drawings</i>	
Dimensions (mm)	<i>As per drawings</i>	
Overall dimensions		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.21: ARCHIMEDES SCREW PUMP – UPPER SCREW PUMP STATION

Description	Specified	Offered
Make and model		
Country of manufacture		
Flow range (m³/s)	0.69-1.39	
Maximum design lift (m)		
Screw angle of inclination (degrees)		
Efficiency at maximum design flow (%)		
Shaft power required (kW)		
Motor rated power (kW)		
Gearbox make and model		
Gearbox type		
Gearbox service factor	> 2	
Scroll diameter (mm)		
Tube diameter (mm)		
Maximum tensile stress in tube (MPa)	20 MPa	
Maximum deflection under self-load and in operation (mm)	As per spec	
Central tube wall thickness (mm)		
Scroll flight thickness (mm)		
Number of flights		
Material of tube	Structural carbon steel	
Material of scroll flights	Structural carbon steel	
Material for tips of scroll flight	EN Grade 1.4401 (316)	
Corrosion protection of screw	As per spec	
Make and model of shaft coupling		
Power rating of shaft coupling (kW)		
Speed rating of shaft coupling (rpm)		
Torque rating of shaft coupling (Nm)		
Mass of rotating assembly (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.22: CLARIFIER BRIDGE (PST's)

Description	Specified	Offered
Bridge type		
Bridge width (walkway width) (mm)		
Mass of bridge (kg)		
Make and model of slewing bearing		
Scraper type (spiral/echelon)	<i>Spiral</i>	
Make and model of bridge geared drive		
Rated power of geared drive motor (kW)		
Output torque of geared drive motor (N.m)		
Service factor of gearbox	> 2	
Wheel material		
Wheel spacing (mm)		
Wheel diameter (mm)		
Wheel load rating (kg)		
Slip ring make and model		
Slip ring IP rating	<i>IP 67</i>	
Stilling chamber diameter		
Stilling chamber material and wall thickness		
Weir plate material and wall thickness		
Total mass of bridge (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.23: CENTRIFUGAL PUMP (MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /s), one pump	0.230 m ³ /s	
Pressure at duty point (m), one pump	2.9 m	
Flow at duty point (m ³ /s), three pumps	1.460 m ³ /s	
Pressure at duty point (m), three pumps	4.8 m	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Maximum diameter of solid object that can be pumped (mm)	> 100 mm	
Material of impeller	CF8M Stainless Steel	
Material of pump casing	Close-grained cast iron	
Corrosion protection (internal)	Abrasion resistant	
Material of shaft		
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.24: ELECTRIC MOTOR (MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Type and design		
Frame size		
Mounting arrangement		
Rate power output for continuous operation (kW)		
Power factor		
Nominal voltage rating (V)	400	
Full load current (Ampere)		
Full load efficiency (%)		
Maximum speed (rpm)		
Cooling configuration		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.25: KNIFE-GATE VALVE (MBR TRANSFER PUMP STATION -
SUCTION PIPEWORK ISOLATION VALVE)**

Description	Specified	Offered
Make and model		
Differential pressure rating (kPa)		
Design pressure rating for body (kPa)		
Size (DN)		
Face to face dimension		
Material of body	Cast Iron	
Material of seal		
Material of blade	Stainless Steel	
Material of spindle	Stainless Steel	
Corrosion protection of valve body	FBE Coated	
Fastener material	Stainless Steel	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.26: KNIFE-GATE VALVE (MBR TRANSFER PUMP STATION -
DISCHARGE PIPEWORK ISOLATION VALVE)**

Description	Specified	Offered
Make and model		
Differential pressure rating (kPa)		
Design pressure rating for body (kPa)		
Size (DN)		
Face to face dimension		
Material of body	Cast Iron	
Material of seal		
Material of blade	Stainless Steel	
Material of spindle	Stainless Steel	
Corrosion protection of valve body	FBE Coated	
Fastener material	Stainless Steel	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.27: METAL SEATED WEDGE GATE VALVE
(MBR TRANSFER PUMP STATION - FLOW METER ISOLATION VALVE)

Description	Specified	Offered
Make and model		
Differential pressure rating (kPa)		
Design pressure rating for body (kPa)		
Size (DN)		
Face to face dimension		
Material of body	Cast Iron	
Material of seat/gate trim	Copper alloy or stainless steel	
Material of gate		
Material of spindle	Stainless Steel 316	
Corrosion protection of valve body	FBE Coated	
Fastener material		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.28: RESILIENT SEAL GATE VALVE (MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Differential pressure rating (kPa)		
Design pressure rating for body (kPa)		
Size (DN)		
Face to face dimension		
Material of body	Cast Iron	
Material of seal		
Material of gate		
Material of spindle	Stainless Steel 316	
Corrosion protection of valve body	FBE Coated	
Fastener material		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.29: CHECK VALVE (MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Differential pressure rating (kPa)		
Design pressure rating for body (kPa)		
Velocity to open check valve fully (m/s)		
Size (DN)		
Face to face dimension		
Material of body	Cast Iron	
Material of seal		
Material of gate		
Corrosion protection of valve body	FBE Coated	
Fastener material	Stainless Steel 316	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.30: AIR VALVE (MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Design pressure rating for body (kPa)		
Size (DN)		
Face to face dimension		
Material of body		
Material of floats		
Material of seat		
Corrosion protection of valve body		
Fastener material	<i>Stainless Steel 316</i>	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.31: PIPE COUPLINGS / FLANGE ADAPTORS DN700
(MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Fabricator		
Pressure rating (kPa)		
Size (DN)		
Face to face dimension		
Material of body		
Material of seal		
Corrosion protection of body		
Fastener material	Stainless Steel 316	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.32: PIPE COUPLINGS / FLANGE ADAPTORS DN400
(MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Fabricator		
Pressure rating (kPa)		
Size (DN)		
Face to face dimension		
Material of body		
Material of seal		
Corrosion protection of body		
Fastener material	<i>Stainless Steel 316</i>	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.33: PIPE COUPLINGS / FLANGE ADAPTORS DN500
(MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Fabricator		
Pressure rating (kPa)		
Size (DN)		
Face to face dimension		
Material of body		
Material of seal		
Corrosion protection of body		
Fastener material	<i>Stainless Steel 316</i>	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.34: PIPE COUPLINGS / FLANGE ADAPTORS DN600
(MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Fabricator		
Pressure rating (kPa)		
Size (DN)		
Face to face dimension		
Material of body		
Material of seal		
Corrosion protection of body		
Fastener material	<i>Stainless Steel 316</i>	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.35: PIPE COUPLINGS / FLANGE ADAPTORS DN900
(MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Make and model		
Fabricator		
Pressure rating (kPa)		
Size (DN)		
Face to face dimension		
Material of body		
Material of seal		
Corrosion protection of body		
Fastener material	<i>Stainless Steel 316</i>	
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.36: LIFTING EQUIPMENT (MBR TRANSFER PUMP STATION)

Description	Specified	Offered
Safe Working Load (kg)	Max load + 25%	
Maximum load for this application (kg)		
Test Load (kg)		
Standard used for design of structure		
Grade of steel for structure		
Corrosion protection		
Hoist make and model		
Hoist rated motor power (kW)		
Hoist gearbox service factor	> 2	
Crawl trolley make and model		
Crawl trolley rated motor power (kW)		
Crawl trolley gearbox service factor	> 2	
End carriages make and model		
End carriages rated motor power (kW)		
End carriages gearbox service factor	> 2	
Rail size implemented		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.37: SELF-PRIMING CENTRIFUGAL PUMP
(PRIMARY SLUDGE PUMP STATION)**

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water	108	
Pressure at duty point (m), for water	8.9 - 14.3	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 38: MACERATOR – PRIMARY SLUDGE PUMP STATION

Description	Specified	Offered
Make and model		
Allowable flow range (m ³ /h), clean water		
Pressure drop over macerator (m)		
Power demand at duty point (kW)		
Rated motor power (kW)		
Material of casing	Cast Iron	
Corrosion protection		
Material of shaft		
Material of cutter and spacers	Hardened Alloy Steel	
Hardness of cutters		
Thickness of cutters (mm)		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.39: LIFTING EQUIPMENT – PRIMARY SLUDGE PUMP STATION

Description	Specified	Offered
Safe Working Load (kg)	Max load + 25%	
Maximum load for this application (kg)		
Test Load (kg)		
Standard used for design of structure		
Grade of steel for structure		
Corrosion protection		
Hoist make and model		
Hoist rated motor power (kW)		
Hoist gearbox service factor	> 2	
Crawl trolley make and model		
Crawl trolley rated motor power (kW)		
Crawl trolley gearbox service factor	> 2	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.40: ACOUSTIC ATTENUATOR – PRIMARY SLUDGE PUMP STATION

Description	Specified	Offered
Make and model		
Type		
Nominal diameter (mm)		
Rated attenuation (dB)		
Flow rate (L/s)		
Absorptive material		
Thickness of absorptive material (mm)		
Construction material		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.41: VENTILATION FAN – PRIMARY SLUDGE PUMP STATION

Description	Specified	Offered
Make and model		
Type (axial, radial, etc.)		
Nominal diameter (mm)		
Rated attenuation (dB)		
Flow rate (L/s)		
Delivery Pressure (Pa)		
Rated Motor Power (kW)		
Operating Speed (rpm)		
Construction material		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 42: PRIMARY SLUDGE HYDRO CYCLONE

Description	Specified	Offered
Make and model		
Material of construction (shell)		
Material of construction (liner)		
Material of construction (overflow pipe)		
Mass of complete unit assembled (kg)		
Flange drilling		
Minimum Flow (m ³ /hr)		
Maximum Flow (m ³ /hr)		
Feed type (tangential or involuted)		
Feed concentration (%solids v/v)		
Particle cut size (µm)		
Minimum inlet pressure (kPa)		
Pressure drop over cyclone		
Water loss		
Outlet spigot (apex) diameter		
Top diameter of cyclone		
Bottom diameter of cyclone		
Overall height of cyclone		
Angle of conical section		
Height of conical section		
Height of cylinder section		
Height of bottom apex		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.43: DEGRITTED PRIMARY SLUDGE GRIT CLASSIFIER

Description	Specified	Offered
Make and model		
Integrated washing (YES/NO)		
Maximum possible feed rate (l/s)	25	
Maximum possible dry material (m ³ /h)	0.5	
Separation efficiency (% and particle size)	95%	
Overall dimensions		
Construction Material - Body	EN Grade 1.4401 (316) or EN Grade 1.4162 (LDX 2101)	
Construction Material – Frame		
Construction Material – Supports		
Construction Material – Screw / Spiral		
Construction Material – Shaft		
Construction Material - Lining		
Drive motor make and model		
Rated motor power (kW)		
Motor Output Torque (N.m)		
Gearbox make and model		
Gearbox service factor		
Gearbox Output Speed (rpm)		
Gearbox output torque (N.m)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.44: SELF-PRIMING CENTRIFUGAL PUMP (DEGRITTED PRIMARY
SLUDGE PUMP STATION)**

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water	108	
Pressure at duty point (m), for water	8.2 - 10.6	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless Steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.45: WAS HOLDING TANK AERATORS

Description	Specified	Offered
Make and model		
Aerator performance details (kgO/hr)		
Power demand at duty point (kW)		
Operating speed (rpm)		
Impeller diameter (m)		
Impeller throw distance (m)		
Minimum impeller submergence required (mm)		
Material of impeller	Carbon steel	
Material of shaft	Carbon steel	
Material of floats	Carbon steel	
Corrosion protection		
Shaft diameter (mm)		
Shaft thickness (if hollow):		
Mass (kg)		
Motor make and model		
Motor shaft output at site conditions (kW)		
Motor rated power output (kW)		
Motor rotational speed (rpm)		
Motor full load current (A)		
Motor full load efficiency (%)		
Power factor at duty point		
Gearbox make and model		
Type		
Service Factor	2.5	
Output shaft speed (rpm)		
Output torque (N.m)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No. 46: PRIMARY SLUDGE HOLDING TANK RECIRCULATION PUMPS

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water	339	
Pressure at duty point (m), for water	6.3	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless Steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.47: SELF-PRIMING CENTRIFUGAL PUMP
(TEMPORARY SERVICE WATER SUPPLY)

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water	250	
Pressure at duty point (m), for water	10	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless Steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.48: SELF-PRIMING CENTRIFUGAL PUMP (WAS PUMPS FROM CAS PLANT TO WAS HOLDING TANK)

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water	389	
Pressure at duty point (m), for water	13.3	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless Steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.49: PRIMARY SLUDGE BELT PRESS FEED PUMPS

Description	Specified	Offered
Make and model		
Type		
Flow range (m ³ /hr)	25 - 60	
Max. pressure (bar, gauge)	2	
Inlet flange size (mm)		
Outlet flange size (mm)		
Duty torque @ duty speed (Nm @ rpm)		
Max. duty power required by pump (kW)		
Material of rotor		
Rotor surfacing details		
Mechanical seal make and model		
Stationary face material		
Rotating face material		
Material of stator		
Motor rating (kW)		
Gearbox make and model		
Gearbox service factor		
Total mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.50: WAS GBT FEED PUMPS

Description	Specified	Offered
Make and model		
Type		
Flow range (m ³ /hr)	50 - 100	
Max. pressure (bar, gauge)	2	
Inlet flange size (mm)		
Outlet flange size (mm)		
Duty torque @ duty speed (Nm @ rpm)		
Max. duty power required by pump (kW)		
Material of rotor		
Rotor surfacing details		
Mechanical seal make and model		
Stationary face material		
Rotating face material		
Material of stator		
Motor rating (kW)		
Gearbox make and model		
Gearbox service factor		
Total mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.51: PRIMARY SLUDGE BELT PRESS

Description	Specified	Offered
General		
Make and model		
Country of manufacture		
Total Belt Width		
Effective belt width (m)	2.5	
Amount of pressure rollers		
Operating range (hydraulic)		
Operating range (solids)		
Overall mass of unit, dry (kg)		
Overall mass of unit, wet (kg)		
Requirements for foundation (size and forces)		
Sludge Flocculation		
Process Principle		
Material of construction		
Number of injection points		
Nominal diameter of mixing unit		
Pre-dewatering section		
Material of Construction		
Length of pre-dewatering section (m)		
Area of pre-dewatering section (m ²)		
Number of chicane rows		
Vertical wedge section		
Material of construction		
Length of dewatering section (m)		
Area of dewatering section (m ²):		
Is wedge angle adjustable (YES/NO)		
Shovel dandy roller		
Material of construction		
Roller diameter (m)		
Shaft diameter (m)		
Roller surface details:		

Description	Specified	Offered
Details of internal device for preventing rewetting of sludge		
Area of dewatering section (m ²)		
Low pressure dewatering section		
Material of construction:		
Corrosion protection		
Number of rollers		
Roller diameters (mm) in order		
Shaft diameter (mm)		
Area of dewatering section (m ²)		
Plate thickness of drum rollers		
Yield strength of roller material (MPa)		
Maximum deflection at midpoint (mm)		
Material of end flanges		
Plate thickness of end flange		
Material of stub shafts		
Diameter of stub shaft		
Describe method of securing stub shaft to drum		
Mass of heaviest drum roller (kg)		
High pressure dewatering section		
Material of construction:		
Corrosion protection		
Number of rollers		
Roller diameters (mm) in order		
Shaft diameter (mm)		
Area of dewatering section (m ²)		
Plate thickness of drum rollers		
Yield strength of roller material (MPa)		
Maximum deflection at midpoint (mm)		
Material of end flanges		
Plate thickness of end flange		
Material of stub shafts		
Diameter of stub shaft		

Description	Specified	Offered
Describe method of securing stub shaft to drum		
Mass of heaviest drum roller (kg)		
Bearings		
Material of construction		
Bearing type		
Seal type		
Bearing lifetime (L10)		
Bearing mounting position (internal or external)		
Frame		
Material of frame structure		
EN grade (or equivalent) of frame structure		
Plate thickness (for single piece frames) (mm)		
Safety flaps material and thickness		
Yield strength of frame material (MPa)		
Material of filtrate collection trays		
Material of sludge discharge chute		
Belt tensioning and tracking		
Type of system		
Material of construction		
Belt cleaning		
Type of system		
Washwater requirement (m3/hr @ kPa)		
Belt Details		
Minimum design belt loading		
Minimum length of top belt (mm)		
Maximum length of top belt (mm)		
Minimum length of bottom belt (mm)		
Maximum length of bottom belt (mm)		
Belt drive unit, make and model		
Belt drive unit, torque rating		
Rated power for drive motor (kW)		
Variable frequency convertor rating for drive motor (kW)		

Description	Specified	Offered
Description of filter belt weave		
Nominal filter belt aperture (mm)		
Material of filter belt		
Belt joint type		
Belt speed range (m/min to m/min)		
Is belt tension adjustable (YES/NO)		

Manufacturer's Performance Rating (i.e. the expected performance, NOT the minimum acceptable performance which tenderers must guarantee)

Maximum hydraulic loading (m^3/hr): _____

Maximum solids loading (ton DS/hr): _____

Cake dry solids content (% DS): _____

Filtrate (% DS): _____

Maximum required poly. consumption (kg/ton DS): _____

Recovery (%): _____

Power consumption: _____

Other comments: _____

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.52: GRAVITY BELT THICKENER

Description	Specified	Offered
General		
Make and model		
Country of manufacture		
Type and design		
Minimum design loading		
Operating range		
Minimum belt length (mm)		
Maximum belt length (mm)		
Effective filter area (m2)		
Drive unit make and model		
Drive motor rated power (kW)		
Variable frequency convertor rating for drive motor (kW)		
Description of filter belt weave		
Nominal filter belt aperture (mm)		
Belt width (mm)		
Material of filter belt		
Belt joint type		
Description of belt tension system		
Description of belt tracking system		
Belt speed range (m/min to m/min)		
Material of main structural assembly		
Corrosion protection of structural assembly		
Material of filtrate collection trays		
Material of sludge discharge chute		
EN Grade of plate of drum rollers (if stainless steel)		
Grade of plate of drum rollers; corrosion protection system & dry film thickness (if carbon steel):		
Mass of heaviest drum roller (kg)		

Description	Specified	Offered
Material of bearing housings and corrosion protection system		
Details of bearing housing and seal arrangement		
Washwater requirement (m ³ /hr @ kPa)		
Mass (kg)		
Requirements for foundation		

Manufacturer's Performance Rating (i.e. the expected performance, NOT the minimum acceptable performance which tenderers must guarantee)

Maximum hydraulic loading (m³/hr): _____

Maximum solids loading (ton DS/hr): _____

Cake dry solids content (% DS): _____

Filtrate (% DS): _____

Maximum required poly. consumption (kg/ton DS): _____

Recovery (%): _____

Power consumption: _____

Other comments: _____

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.53: WAS SLUDGE BELT PRESS

Description	Specified	Offered
General		
Make and model		
Country of manufacture		
Total Belt Width		
Effective belt width	2.5	
Amount of pressure rollers		
Operating range (hydraulic)		
Operating range (solids)		
Overall mass of unit, dry (kg)		
Overall mass of unit, wet (kg)		
Requirements for foundation (size and forces)		
Sludge Flocculation		
Process Principle		
Material of construction		
Number of injection points		
Nominal diameter of mixing unit		
Pre-dewatering section		
Material of Construction		
Length of pre-dewatering section (m)		
Area of pre-dewatering section (m ²)		
Number of chicane rows		
Vertical wedge section		
Material of construction		
Length of dewatering section (m)		
Area of dewatering section (m ²):		
Is wedge angle adjustable (YES/NO)		
Shovel dandy roller		
Material of construction		
Roller diameter (m)		
Shaft diameter (m)		
Roller surface details:		

Description	Specified	Offered
Details of internal device for preventing rewetting of sludge		
Area of dewatering section (m ²)		
Low pressure dewatering section		
Material of construction:		
Corrosion protection		
Number of rollers		
Roller diameters (mm) in order		
Shaft diameter (mm)		
Area of dewatering section (m ²)		
Plate thickness of drum rollers		
Yield strength of roller material (MPa)		
Maximum deflection at midpoint (mm)		
Material of end flanges		
Plate thickness of end flange		
Material of stub shafts		
Diameter of stub shaft		
Describe method of securing stub shaft to drum		
Mass of heaviest drum roller (kg)		
High pressure dewatering section		
Material of construction:		
Corrosion protection		
Number of rollers		
Roller diameters (mm) in order		
Shaft diameter (mm)		
Area of dewatering section (m ²)		
Plate thickness of drum rollers		
Yield strength of roller material (MPa)		
Maximum deflection at midpoint (mm)		
Material of end flanges		
Plate thickness of end flange		
Material of stub shafts		
Diameter of stub shaft		

Description	Specified	Offered
Describe method of securing stub shaft to drum		
Mass of heaviest drum roller (kg)		
Bearings		
Material of construction		
Bearing type		
Seal type		
Bearing lifetime (L10)		
Bearing mounting position (internal or external)		
Frame		
Material of frame structure		
EN grade (or equivalent) of frame structure		
Plate thickness (for single piece frames) (mm)		
Safety flaps material and thickness		
Yield strength of frame material (MPa)		
Material of filtrate collection trays		
Material of sludge discharge chute		
Belt tensioning and tracking		
Type of system		
Material of construction		
Belt cleaning		
Type of system		
Washwater requirement (m3/hr @ kPa)		
Belt Details		
Minimum design belt loading		
Minimum length of top belt (mm)		
Maximum length of top belt (mm)		
Minimum length of bottom belt (mm)		
Maximum length of bottom belt (mm)		
Belt drive unit, make and model		
Belt drive unit, torque rating		
Rated power for drive motor (kW)		
Variable frequency convertor rating for drive motor (kW)		

Description	Specified	Offered
Description of filter belt weave		
Nominal filter belt aperture (mm)		
Material of filter belt		
Belt joint type		
Belt speed range (m/min to m/min)		
Is belt tension adjustable (YES/NO)		

Manufacturer's Performance Rating (i.e. the expected performance, NOT the minimum acceptable performance which tenderers must guarantee)

Maximum hydraulic loading (m³/hr): _____

Maximum solids loading (ton DS/hr): _____

Cake dry solids content (% DS): _____

Filtrate (% DS): _____

Maximum required poly. consumption (kg/ton DS): _____

Recovery (%): _____

Power consumption: _____

Other comments: _____

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.54: PRIMARY SLUDGE HORIZONTAL CONVEYOR
(IN DEWATERING BUILDING)**

Description	Specified	Offered
Make and model		
Type		
Operating capacity (kg/hr)		
Operating capacity (m ³ /hr)	2 - 10	
Length of screw (m)		
Nominal diameter of screw (mm)		
Rated motor power (kW)		
Power required by unit at design point (kW)		
Gearbox make and model		
Gearbox service factor		
Gearbox output torque (N.m)		
Gearbox output speed (rpm)		
Screw material		
Screw material thickness (mm)		
Trough material		
Trough material thickness (mm)		
Material of trough liner		
Overall mass (kg)		
Overall length (m)		
Description of trip lines		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.55: WASTE ACTIVATED SLUDGE HORIZONTAL CONVEYOR
(IN DEWATERING BUILDING)**

Description	Specified	Offered
Make and model		
Type		
Operating capacity (kg/hr)		
Operating capacity (m ³ /hr)	5 - 15	
Length of screw (m)		
Nominal diameter of screw (mm)		
Rated motor power (kW)		
Power required by unit at design point (kW)		
Gearbox make and model		
Gearbox service factor		
Gearbox output torque (N.m)		
Gearbox output speed (rpm)		
Screw material		
Screw material thickness (mm)		
Trough material		
Trough material thickness (mm)		
Material of trough liner		
Overall mass (kg)		
Overall length (m)		
Description of trip lines		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.56: DEWATERED WASTE ACTIVATED SLUDGE PUMPS

Description	Specified	Offered
Make and model		
Type		
Flow range (m ³ /hr)	5 - 15	
Max. pressure (m)		
Inlet flange size (mm)		
Outlet flange size (mm)		
Maximum rubbing speed (m/s)		
Duty torque @ duty speed (Nm @ rpm)		
Max. duty power required by pump (kW)		
Material of rotor		
Rotor surfacing details		
Mechanical seal make and model		
Stationary face material		
Rotating face material		
Material of stator		
Motor rating (kW)		
Gearbox make and model		
Gearbox service factor		
Total mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.57: DEWATERED PRIMARY SLUDGE PUMPS

Description	Specified	Offered
Make and model		
Type		
Flow range (m ³ /hr)	2 - 10	
Max. pressure (m)		
Inlet flange size (mm)		
Outlet flange size (mm)		
Maximum rubbing speed (m/s)		
Duty torque @ duty speed (Nm @ rpm)		
Max. duty power required by pump (kW)		
Material of rotor		
Rotor surfacing details		
Mechanical seal make and model		
Stationary face material		
Rotating face material		
Material of stator		
Motor rating (kW)		
Gearbox make and model		
Gearbox service factor		
Total mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.58: LIVE BOTTOM SCREW CONVEYOR (PRIMARY SLUDGE)

Description	Specified	Offered
Make and model		
Type		
Operating capacity (kg/hr)		
Operating capacity (m ³ /hr)	60	
Length of screw (m)		
Nominal diameter of screw (mm)		
Rated motor power (kW)		
Power required by unit at design point (kW)		
Gearbox make and model		
Gearbox service factor		
Gearbox output torque (N.m)		
Gearbox output speed (rpm)		
Screw material		
Screw material thickness (mm)		
Trough material		
Trough material thickness (mm)		
Material of trough liner		
Overall mass (kg)		
Overall length (m)		

Details of actuated outlet valves/gate (size, type, actuation etc.): _____

Details of access platform, stairway and cat ladder at sludge silo (overall dimensions, load carry capacity etc.) Tender to submit basic GA drawing of proposal with tender): _____

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.59: LIVE BOTTOM SCREW CONVEYOR (WASTE ACTIVATED SLUDGE)

Description	Specified	Offered
Make and model		
Type		
Operating capacity (kg/hr)		
Operating capacity (m³/hr)	60	
Length of screw (m)		
Nominal diameter of screw (mm)		
Rated motor power (kW)		
Power required by unit at design point (kW)		
Gearbox make and model		
Gearbox service factor		
Gearbox output torque (N.m)		
Gearbox output speed (rpm)		
Screw material		
Screw material thickness (mm)		
Trough material		
Trough material thickness (mm)		
Material of trough liner		
Overall mass (kg)		
Overall length (m)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.60: SELF-PRIMING CENTRIFUGAL PUMP (WAS FILTRATE PUMPS)

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water, 3 pumps in parallel	1080	
Pressure at duty point (m), for water	15.5 – 18.2	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.61: LIFTING EQUIPMENT – DEWATERING BUILDING

Description	Specified	Offered
Safe Working Load (kg)	Max load + 25%	
Maximum load for this application (kg)		
Test Load (kg)		
Standard used for design of structure		
Grade of steel for structure		
Corrosion protection		
Hoist make and model		
Hoist rated motor power (kW)		
Hoist gearbox service factor	> 2	
Crawl trolley make and model		
Crawl trolley rated motor power (kW)		
Crawl trolley gearbox service factor	> 2	
End carriages make and model		
End carriages rated motor power (kW)		
End carriages gearbox service factor	> 2	
Rail size implemented		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.62: VENTILATION FAN – DEWATERING BUILDING

Description	Specified	Offered
Make and model		
Type (axial, radial, etc.)		
Nominal diameter (mm)		
Flow rate (L/s)		
Delivery Pressure (Pa)		
Rated Motor Power (kW)		
Operating Speed (rpm)		
Construction material		
Mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.63: ODOUR CONTROL – DEWATERING BUILDING

Description	Specified	Offered
BIOLOGICAL FILTER / CHEMICAL SCRUBBER		
Make and model		
Treatment flow capacity (m³/h)	30 506	
Volume of media (m³)		
Overall dimensions		
Footprint (mm x mm)		
Material of tank construction		
Nutrients to be added to system (if applicable)		
Recirculation pump make & model		
Recirculation pump rated kW		
Recirculation pump flow rate and pressure		
Empty Bed Residence Time (seconds)		
Service life of media at average H ₂ S load (years)		
Daily water requirements (litres)		
System dry mass (kg)		
System operation mass, wet (kg)		
Overall power requirement (kW)		
ODOUR CONTROL FAN		
Make and model		
Pressure and flow at duty point		
Power required at duty point (kW)		
Rated motor power (kW)		
Material of casing		
Material of blade		
Fan mass (kg)		
CHANNEL COVERS		
Material used (outer and inner)		
Overall thickness of cover (mm)		
Maximum load for walk-on covers (kg)		
UV resistant	Yes	
Anti-slip	Yes	

Description	Specified	Offered
DUCTING AND VALVES		
Material and class of ducting	u-PVC Class 9	
Material of valves	PVC	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.64: SERVICE WATER PUMPS – DEWATERING BUILDING

Description	Specified	Offered
Make and model		
Shut-off head		
Flow at duty point (m ³ /h), for water, two pumps in parallel	400	
Pressure at duty point (m), for water, two pumps in parallel	65	
Power demand at duty point (kW)		
Pump efficiency at duty point (%)		
Pump best efficiency point (%)		
NPSH _{required} at duty point (absolute pressure in metres)		
Impeller diameter (mm)		
Inlet diameter (mm)		
Outlet diameter (mm)		
Re-prime height for this application (m)		
Maximum diameter of solid object that can be pumped (mm)		
Material of impeller	Ductile Iron/Stainless Steel	
Material of pump casing	Grey cast iron / ductile cast iron / stainless steel	
Corrosion protection (internal)		
Material of shaft	Stainless steel (400 series)	
Material of wear ring (or equivalent)		
Mechanical seal type and model		
Motor make and model		
Motor nominal rating (kW)		
Mass (kg)		
Pump Seal Type		
Seal materials		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

**TECHNICAL DATA SHEET No.65: SURFACE-MOUNTED MECHANICAL MIXERS
(POLY MAKE-UP TANK)**

Description	Specified	Offered
Make and model		
Type		
Mixer impeller diameter (mm)		
Mixer thrust produced (N)		
Motor make and model		
Absorbed power (kW)		
Motor rated power (kW)		
Mixer speed (rpm)		
Gearbox make and model		
Gearbox service factor		
Gearbox output speed (rpm)		
Mixer impeller material	<i>Stainless Steel 316</i>	
Mixer shaft material	<i>Stainless Steel 316</i>	
Total mass (kg), including motor and gearbox		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.66: POLY MAKE-UP SYSTEM

Description	Specified	Offered
ROTARY SCREW FEEDER		
Make and model		
Capacity (kg/h)		
Speed (rpm)		
Motor make and model		
Motor rated power (kW)		
Gearbox make and model		
Gearbox service factor		
Accuracy (%)		
DRY FEED STORAGE HOPPER		
Manufacturer		
Capacity (m ³)		
Construction material	LDX 2101	
JET WET HEAD		
Manufacturer		
Model		
Required flow (m ³ /h)		
Required pressure (m)		
Capacity (kg poly / h)		
MIXERS		
	MAKE-UP TANKS	STOCK TANK
Number of mixers		
Speed		
Type		
Maximum shear		
Motor make and model		
Absorbed power (kW)		
Rated motor power (kW)		
Gearbox make and model		
Gearbox service factor		
Gearbox output speed		

Description	Specified	Offered
PIPING TO JET WET HEAD		
Diameter (mm)		
Material		
Valve types used		
Valve material		
PIPING MAKE-UP WATER		
Diameter (mm)		
Material		
Valve types used		
Valve material		
BLOWER		
Make and model		
Type		
Flow rate and pressure		
Motor rated power (kW)		
Poly transport capacity (kg/hr)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.67: WAS POLY DOSING PUMPS

Description	Specified	Offered
Make and model		
Type		
Flow range (m ³ /h)	0.5 - 4	
Max. pressure (m)		
Inlet flange size (mm)		
Outlet flange size (mm)		
Maximum rubbing speed (m/s)		
Duty torque @ duty speed (Nm @ rpm)		
Max. duty power required by pump (kW)		
Material of rotor		
Rotor surfacing details		
Mechanical seal make and model		
Stationary face material		
Rotating face material		
Material of stator		
Motor rating (kW)		
Gearbox make and model		
Gearbox service factor		
Total mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.68: PRIMARY SLUDGE POLY DOSING PUMPS

Description	Specified	Offered
Make and model		
Type		
Flow range (m ³ /hr)	1.5 - 7	
Max. pressure (m)		
Inlet flange size (mm)		
Outlet flange size (mm)		
Maximum rubbing speed (m/s)		
Duty torque @ duty speed (Nm @ rpm)		
Max. duty power required by pump (kW)		
Material of rotor		
Rotor surfacing details		
Mechanical seal make and model		
Stationary face material		
Rotating face material		
Material of stator		
Motor rating (kW)		
Gearbox make and model		
Gearbox service factor		
Total mass (kg)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.69: LIFTING EQUIPMENT – POLY STORAGE AREA

Description	Specified	Offered
Safe Working Load (kg)	Max load + 25%	
Maximum load for this application (kg)		
Test Load (kg)		
Standard used for design of structure		
Grade of steel for structure		
Corrosion protection		
Hoist make and model		
Hoist rated motor power (kW)		
Hoist gearbox service factor	> 2	
Crawl trolley make and model		
Crawl trolley rated motor power (kW)		
Crawl trolley gearbox service factor	> 2	
End carriages make and model		
End carriages rated motor power (kW)		
End carriages gearbox service factor	> 2	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.70: MOTORS FOR ARCHIMEDES SCREW PUMPS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	ELECTRICAL OPERATING CONDITIONS			
1.1	Supply voltage (nominal)	V	400	
1.2	Number of phases		3	
1.3	Frequency	Hz	50	
1.4	Voltage and frequency variations	%	As per SANS 1804-2	
1.5	Supply voltage harmonic voltage factor		As per SANS 60034-1	
1.6	Supply voltage negative sequence component	%		
1.7	Supply neutral earthed directly/resistively (high/low)		Directly	
2	SITE OPERATING CONDITIONS			
2.1	Altitude a.s.l.	m	As per Specification	
2.2	Maximum ambient temperature	°C		
2.3	Minimum ambient temperature	°C		
3	MOTOR RATING			
3.1	Rated output	kW	as per Contractor's design	
3.2	Duty class		S1	
3.3	Output margin above load absorbed power	%	15	
3.4	Speed (synchronous)	rpm	as per Contractor's design	
3.5	Speed at rated output, voltage and frequency	rpm		
3.6	Rated voltage	V	400	
3.7	Full load current	A		
3.8	Efficiency class (IE1/2/3)		IE2	
3.9	Rated torque	Nm		
4	ENCLOSURE, CONSTRUCTION & MOUNTING			
4.1	Ingress protection rating		IP55	
4.2	Cooling method		IC411	
4.3	Construction and mounting arrangement		IM B3	
4.4	Terminal box location (R/B/L/T)		as per Contractor's design	
4.5	Cable entry location		Below	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
4.6	Cable type and size		As per SLD	
4.7	Corrosion protection (standard/corrosive environment)		Corrosive	
5	WINDINGS TYPE, INSULATION & TEMPERATURE RISE			
5.1	Stator winding type (random/formed diamond coil)		Formed	
5.2	Insulation and impregnation system		VPI	
5.3	Insulation thermal class	(F/H)	F	
5.4	Temperature rise class	(B/F)	B	
5.5	Maximum temperature rise at rated output (Zone A supply)	K		
5.6	Maximum temperature rise at rated output (Zone C supply)	K		
5.7	Windings thermal protection (thermistor/PT100) per winding		PT100	
6	GENERAL PERFORMANCE			
6.1	Efficiency at rated output	%		
6.2	Efficiency at rated 75% output	%		
6.3	Efficiency at rated 50% output	%		
6.4	Power factor at rated output	pu		
6.5	Power factor at 75% rated output	pu		
6.6	Power factor at 50% rated output	pu		
6.7	Sound power level at rated load	dBA		
6.8	Silencer required		No	
7	STARTING PERFORMANCE			
7.1	Starting method		Soft Starter	
7.2	Motor moment of inertia	kg.m ²		
7.3	Number of starts per hour (cold/hot)		6/2	
7.4	Starting current (x full load current)	A		
7.5	Starting torque (x rated torque)	N m		
7.6	Pull-up torque (x rated torque)	N m		
7.7	Breakdown torque (x rated torque)	N m		
7.8	Starting power factor	pu		
7.9	Run up time of driven load (state pu starting current)	s		
8	DRIVEN LOAD AND COUPLING			
8.1	Load type		Screw Pump	
8.2	Load moment of inertia at motor speed	kg.m ²		
8.3	Coupling method (direct/gearbox/v-belt)			

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
9	BEARINGS			
9.1	Manufacturer			
9.2	DE bearing type (ball/roller/sleeve)		<i>Ball/roller</i>	
9.3	DE bearing lubrication type (sealed/regreasable)			
9.4	DE bearing life (L10)	<i>h</i>		
9.5	DE bearing regrease interval	<i>h</i>		
9.6	NDE bearing type (ball/roller/sleeve)		<i>Ball/roller</i>	
9.7	NDE bearing lubrication type (sealed/regreasable)			
9.8	NDE bearing life (L10)	<i>h</i>		
9.9	NDE bearing regrease interval	<i>h</i>		
9.10	Bearing thermal protection (thermistor/PT100)			
10	DIMENSIONS AND WEIGHT			
10.1	Motor frame number			
10.2	Motor weight	<i>kg</i>		
11	VARIABLE SPEED APPLICATIONS			
11.1	Operating speed range	<i>rpm</i>	<i>As per load</i>	
11.2	Maximum safe operating speed	<i>rpm</i>		
11.3	Peak voltage withstand level	<i>V</i>		
11.4	Voltage gradient withstand level	<i>V/s</i>		
11.5	Separately-powered cooling fan			
12	OPTIONAL ITEMS			
12.1	Anti-condensation heaters		<i>Yes</i>	
12.2	Slide rails (for v-belt drives)		<i>No</i>	
12.3	Surge protection devices		<i>No</i>	
12.4	Adjusting bolts required		<i>Yes</i>	
13	FACTORY TESTS			
13.1	Routine tests in addition to SANS 1804-2 requirements			
13.1.1	Insulation resistance check		<i>Yes</i>	
13.1.2	Vibration velocity measurement		<i>No</i>	
13.2	Type tests in addition to SANS 1804-2 requirements			
13.2.1	Current vs speed curve		<i>Yes</i>	
13.2.2	Torque vs speed curve		<i>Yes</i>	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
14	DRAWINGS/CURVES TO BE PROVIDED WITH TENDER			
14.1	Motor general arrangement with dimensions		Yes	
14.2	Main terminal box with fault rating indicated		Yes	
14.3	Current vs speed curve		Yes	
14.4	Torque vs speed curve		Yes	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.71: MOTORS UNDER 90 kW

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	ELECTRICAL OPERATING CONDITIONS			
1.1	Supply voltage (nominal)	V	400	
1.2	Number of phases		3	
1.3	Frequency	Hz	50	
1.4	Voltage and frequency variations	%	As per SANS 1804-2	
1.5	Supply voltage harmonic voltage factor		As per SANS 60034-1	
1.6	Supply voltage negative sequence component	%		
1.7	Supply neutral earthed directly/resistively (high/low)		Directly	
2	SITE OPERATING CONDITIONS			
2.1	Altitude a.s.l.	m	As per Specification	
2.2	Maximum ambient temperature	°C		
2.3	Minimum ambient temperature	°C		
3	MOTOR RATING			
3.1	Rated output	kW	as per Contractor's design	
3.2	Duty class		S1	
3.3	Output margin above load absorbed power	%	15	
3.4	Speed (synchronous)	rpm	1500	
3.5	Speed at rated output, voltage and frequency	rpm		
3.6	Rated voltage	V	400	
3.7	Full load current	A		
3.8	Efficiency class (IE1/2/3)		IE2	
3.9	Rated torque	Nm		
4	ENCLOSURE, CONSTRUCTION & MOUNTING			
4.1	Ingress protection rating		IP55, IP68 for submersible	
4.2	Cooling method		IC411	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
4.3	Construction and mounting arrangement		IM B3	
4.4	Terminal box location (R/B/L/T)		as per Contractor's design	
4.5	Cable entry location		Below	
4.6	Cable type and size		As per SLD	
4.7	Corrosion protection (standard/corrosive environment)		Corrosive	
5	WINDINGS TYPE, INSULATION & TEMPERATURE RISE			
5.1	Stator winding type (random/formed diamond coil)		Formed	
5.2	Insulation and impregnation system		VPI	
5.3	Insulation thermal class	(F/H)	F	
5.4	Temperature rise class	(B/F)	B	
5.5	Maximum temperature rise at rated output (Zone A supply)	K		
5.6	Maximum temperature rise at rated output (Zone C supply)	K		
5.7	Windings thermal protection (thermistor/PT100) per winding		thermistor	
6	GENERAL PERFORMANCE			
6.1	Efficiency at rated output	%		
6.2	Efficiency at rated 75% output	%		
6.3	Efficiency at rated 50% output	%		
6.4	Power factor at rated output	pu		
6.5	Power factor at 75% rated output	pu		
6.6	Power factor at 50% rated output	pu		
6.7	Sound power level at rated load	dBA		
6.8	Silencer required		No	
7	STARTING PERFORMANCE			
7.1	Starting method		Various	
7.2	Motor moment of inertia	kg.m ²		
7.3	Number of starts per hour (cold/hot)		6/2	
7.4	Starting current (x full load current)	A		
7.5	Starting torque (x rated torque)	N m		
7.6	Pull-up torque (x rated torque)	N m		
7.7	Breakdown torque (x rated torque)	N m		
7.8	Starting power factor	pu		

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
7.9	Run up time of driven load (state pu starting current)	s		
8	DRIVEN LOAD AND COUPLING			
8.1	Load type		Blower	
8.2	Load moment of inertia at motor speed	kg.m ²		
8.3	Coupling method (direct/gearbox/v-belt)			
9	BEARINGS			
9.1	Manufacturer			
9.2	DE bearing type (ball/roller/sleeve)		Ball/roller	
9.3	DE bearing lubrication type (sealed/regreaseable)			
9.4	DE bearing life (L10)	h		
9.5	DE bearing regrease interval	h		
9.6	NDE bearing type (ball/roller/sleeve)		Ball/roller	
9.7	NDE bearing lubrication type (sealed/regreaseable)			
9.8	NDE bearing life (L10)	h		
9.9	NDE bearing regrease interval	h		
9.10	Bearing thermal protection (thermistor/PT100)			
10	DIMENSIONS AND WEIGHT			
10.1	Motor frame number			
10.2	Motor weight	kg		
11	VARIABLE SPEED APPLICATIONS			N/A
11.1	Operating speed range	rpm	As per load	
11.2	Maximum safe operating speed	rpm		
11.3	Peak voltage withstand level	V		
11.4	Voltage gradient withstand level	V/s		
11.5	Separately-powered cooling fan			
12	OPTIONAL ITEMS			
12.1	Anti-condensation heaters		Yes	
12.2	Slide rails (for v-belt drives)		No	
12.3	Surge protection devices		No	
12.4	Adjusting bolts required		Yes	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
13	FACTORY TESTS			
13.1	Routine tests in addition to SANS 1804-2 requirements			
13.1.1	Insulation resistance check		Yes	
13.1.2	Vibration velocity measurement		No	
13.2	Type tests in addition to SANS 1804-2 requirements			
13.2.1	Current vs speed curve		Yes	
13.2.2	Torque vs speed curve		Yes	
14	DRAWINGS/CURVES TO BE PROVIDED WITH TENDER			
14.1	Motor general arrangement with dimensions		Yes	
14.2	Main terminal box with fault rating indicated		Yes	
14.3	Current vs speed curve		Yes for ≥30kW	
14.4	Torque vs speed curve		Yes for ≥30kW	

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

TECHNICAL DATA SHEET No.72: ELECTRIC ACTUATORS

Description	Specified	Offered
Make and model		
Motor rating (kW)		
Max. available operating torque (N.m)		
Protection available		
Type of over-temperature protection		
Minimum Design Life: On-Off / Inching duties (Number of Cycles)		
Minimum Design Life: Modulating duties (Number of Starts)		
Gearbox ratio		
Construction materials		
Corrosion protection		
Mass (kg)		
IP Rating	IP 68	
Paint Colour		
Motor Class of Insulation		
CONTROL		
<u>REMOTE SIGNALS REQUIRED</u>		
Valve Fully Open (YES/NO)	YES	
Valve Fully Closed (YES/NO)	YES	
Valve Intermediate Position (YES/NO)		
Locked out (by switch disconnect) (YES/NO)		
Valve Position Monitor (4-20mA) Provided /Required (YES/NO)		
Actuator Torque Monitor (4-20mA) Provided / Required (YES/NO)		
Fieldbus Compatibility (YES/NO)	YES	
Two-Wire Current Position Controller (YES/NO)		
4 and 20mA to Correspond to Fully Closed and Fully Open (YES/NO)		

TECHNICAL DATA SHEET No.73: POLY STORAGE DEHUMIDIFIER

Description	Specified	Offered
Make and model		
Type		
Power Supply		
Average Operating Consumption (W)		
Operating Temperature Range		
Moisture removal at 27°C and 65%RH (Litre / 24h)		
Moisture removal at 27°C and 80%RH (Litre / 24h)		
Condensate Tank Capacity (litre)		
Mass (kg)		
Dimensions (mm x mm x mm)		
Sound Level (dBA)		

Note: In addition, drawings/brochures showing details of the equipment offered and other relevant information must be submitted with the tender.

CITY OF CAPE TOWN

WATER AND SANITATION

CONTRACT NO. 85Q/2016/17

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE CONSTRUCTION OF
PRIMARY TREATMENT AND SLUDGE HANDLING FACILITIES AT ZANDVLIET WASTEWATER
TREATMENT WORKS

SECTION 2

TECHNICAL DATA SHEETS - ELECTRICAL

DETAIL SHEET No. E01
MINIATURE SUBSTATIONS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	GENERAL			
1.1	Manufacturer			
1.2	Country of Origin			
1.3	Mini Sub Rating			
1.3.1	Power Rating	kVA	1600, 1000	
1.3.2	Number of Phases		3	
1.3.3	Frequency - As per System Electrical Conditions	Hz	50	
1.4	Voltages			
1.4.1	Primary Voltage	kV	11000	
1.4.2	Secondary Voltage	kV	420	
1.5	Insulation Level			
1.5.1	Primary Voltage	kV	95	
1.5.2	Secondary Voltage	kV	30	
1.6	Electrical System Operating Parameters		See Project Specs	
1.7	Physical and Climatic Site Conditions		Outdoors, Coastal, very corrosive conditions	
1.8	Reference single line diagram -Drawing number		EL-161	
2	CONSTRUCTION AND FITTINGS			
2.1	Minisub Type	A/B	B	
2.2	Minisub Design (Modular/Unitary)		Unitary	
2.3	Enclosure Material		3CR12	
2.4	Base			
2.4.1	Base type			
2.4.2	Is a base with removable section required	Yes/No	Yes	
2.4.3	Black epoxy tar paint required	Yes/No		
2.5	Are roof lifting lugs required	Yes/No	Yes	
2.6	Padlock protection facility	Yes/No	Yes	
2.7	10mm Allen cap screw for doors	Yes/No	Yes	
3	MV COMPARTMENT			
3.1	Earth fault indicators	Yes/No	Yes	
3.2	Cables to be Terminated			
3.2.1	Three Core or Single Core		Three core	
3.2.2	Type of cable (PILC/XLPE)		PILC/XLPE	
3.2.3	Cable size	mm ²	185/95	
3.2.4	Cable Support (Gland plate / cable clamps)			
3.3	Switchgear			
3.3.1	Manufacturer		ABB SafePlus or approved equivalent	
3.3.2	Country of Origin			
3.3.3	Configuration		As per SLD	
3.3.4	Voltage present indication system on all switching devices	Yes/No	Yes	
3.3.5	Insulating Medium	Oil/SF6	SF6	
3.3.6	Auxilliary contacts required	Yes/No	Yes	
3.3.7	Local feeder (T-off) protection			
3.3.7.1	Circuit breaker or fuse-switch-disconnector		Circuit Breaker	
3.3.7.2	Rating	A	200	
3.3.8	CB/fuse-switch-disconnector type	Oil/Vacuum	Vacuum	
4	TRANSFORMER COMPARTMENT			
4.1	Manufacturer			
4.2	Country of Origin			
4.3	Transformer Type	Oil-type/Dry-type	Oil Type	
4.4	Oil-level guage	Yes/No	Yes	
4.5	Indicating Thermometer	Yes/No	Yes	
4.6	Transformer Rating			
4.6.1	Continuous Overload Capacity	%	10	
4.6.2	Impedance	%		
4.6.3	Vector Group		Dyn 11	
4.6.4	Cooling method	ONAN / ONAF	ONAN	

DETAIL SHEET No. E01
MINIATURE SUBSTATIONS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
4.6.4	Losses			
4.6.4.1	No-load Losses	W		
4.6.4.2	Full load Losses	W		
4.7	Tapping Method			
4.7.1	Number of Taps	No	5	
4.7.2	Tapping Range	%	0±3; ±6	
4.7.3	Switch or Bolted Links	Off-load	Switch	
4.8	Terminations			
4.8.1	Medium Voltage Bushings			
4.8.1.1	Material			
4.8.1.2	Creepage Distance	mm		
4.8.1.3	Basic Insulation Level (BIL)	kV	95	
4.8.1.4	Type		C	
4.8.2	Low Voltage Bushings			
4.8.2.1	Material			
4.8.2.2	Creepage Distance	mm		
4.8.2.3	Basic Insulation Level (BIL)	kV	30	
5	LV COMPARTMENT			
5.1	Separate LV earth bar required	Yes/No	Yes	
5.2	Main LV circuit breaker	Yes/No	No	
5.3	Main LV switch disconnecter	Yes/No	Yes	
5.4	Number of LV feeders		As per SLD	
5.5	LV feeder protection			
5.5.1	MCCBs or fuses to be used		As per SLD	
5.5.2	Rating of protection for each feeder	A	As per SLD	
5.6	LV Metering			
5.6.1	Main LV Meter required	Yes/No	No	
5.6.2	Manufacturer and model Number			
5.6.3	Metering on each feeder required	Yes/No		
5.6.4	Manufacturer and model Number			
5.6.5	CT Ratio			
5.6.6	CT Class			
5.7	LV ammeters for all three phases (Maximum Demand Type with 0 - 800A scale)	Yes/No	No	
5.8	One voltmeter (200 - 500V scale) with selector switch to enable any one of phase voltages to be read (complete with HRC fuses)	Yes/No	No	
5.9	Single Phase 16A three pin socket outlet complete with earth leakage required	Yes/No	No	
5.10	LV compartment lampholder required	Yes/No	No	
5.11	Street lighting panel provided	Yes/No	No	
5.12	Cable Support (Gland plate / cable clamps)			
6	CONFIRMATION OF MINI SUB TESTS CONDUCTED			
6.1	Minisub routine test certificate provided	Yes/No	Yes	
6.2	Minisub type test certificate provided	Yes/No	Yes	
6.3	Transformer Type Tested to IEC 60076-11			
a	Temperature-rise Test (IEC 60076-2)	Yes / No	Yes	
b	Dielectric Type Test (IEC 60076-3)	Yes / No	Yes	
c	Determination of Sound Level (IEC 60076-10) for each method of cooling for which a guaranteed sound level is specified	Yes / No	Yes	
d	Measurement of power taken by the fan and liquid pump motors	Yes / No	Yes	
e	Measurement of No Load Loss and Current at 90% and 110% of Rated Voltage	Yes / No	Yes	
6.4	Transformer Routine Test to be Conducted			
a	Measurement of winding resistance(11.2)	Yes / No	Yes	
b	Measurement of voltage ratio and check of phase displacement (11.3)	Yes / No	Yes	
c	Measurement of short-circuit impedance and load loss(11.4)	Yes / No	Yes	
d	Measurement of no-load loss and current (11.5)	Yes / No	Yes	
e	Dielectric routine test (IEC 60076-3)	Yes / No	Yes	
f	Test on on-load tap-changers, where appropriate (11.7)	Yes / No	Yes	
g	Leak testing with pressure for liquid-immersed transformers (tightness test)(11.8)	Yes / No	Yes	
h	Tightness tests and pressure tests for tanks for gas-filled transformers (refer to 60076-15)	Yes / No	Yes	
i	check for the ratio and polarity of built-in current transformers	Yes / No	Yes	
j	Check of core and frame insulation for liquid immersed transformers with core or frame insulation(11.2)	Yes / No	Yes	

DETAIL SHEET No. E01
MINIATURE SUBSTATIONS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
6.5	Special Tests to IEC 60076-14			
a	Dielectric Special Test (IEC 60076-3)	Yes / No	No	
b	Winding Hot-Spot Temperature Rise Measurement	Yes / No	No	
c	Determination of capacitances windings-to-earth and between windings	Yes / No	No	
d	Measurement of dissipation factor $\tan \delta$ of the insulation system capacitance	Yes / No	No	
e	Determination of transient voltage transfer characteristics (Annex B of IEC 60076-3:2000)	Yes / No	No	
f	Measurement of zero sequence impedance(s) on three phase transformers (11.6)	Yes / No	No	
g	Short Circuit withstand test (IEC 60076-5)	Yes / No	No	
h	Measurement of d.c insulation resistance each winding to earth and between windings	Yes / No	No	
i	vacuum deflection test on liquid immersed transformers (11.9)	Yes / No	No	
j	Pressure deflection test on liquid immersed transformers (11.10)	Yes / No	No	
k	Vacuum tightness test on site on liquid immersed transformers (1.11)	Yes / No	No	
l	Measurement of frequency response (Frequency Response Analysis or FRA). The test procedure shall be agreed between manufacturer and purchaser.	Yes / No	No	
m	Check of external coating (ISO 2178 and ISO 2409 or as specialised)	Yes / No	No	
n	Measurement of dissolved gasses in dielectric liquid	Yes / No	No	
o	Mechanical test or assessment of tank for suitability for transport (to customer specification)	Yes / No	No	
p	Determination of weight with transformer arranged for transport. For transformer up to 1.6MVA by measurement. For larger transformers by measurement or calculation as agreed between manufacturer and purchaser.	Yes / No	No	
7	Labelling and Marking to SANS 1029	Yes/No	Yes	
8	RATING PLATES			
8.1	Rating plates to SANS 1029	Yes/No	Yes	
9	OVERALL DIMENSIONS			1000kVA 1600kVA
9.1	Length	mm		
9.2	Width	mm		
9.3	Height	mm		
9.4	Total mass	kg		
10	FINISHING			
10.1	Colour of Minisub to SANS 1091		C12 - Avocado Green	
10.2	Paintwork finish		Matt	
11	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements

Name (Print): _____

DETAIL SHEET No. E02
MV CABLES AND CABLE SYSTEMS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	MEDIUM VOLTAGE CABLES			
1.1	Manufacturer			
1.2	Country of Origin			
1.3	Operating Voltage	kV	11	
1.4	Number of Cores	No	3	
1.5	Size	mm ²	Various	
1.6	Conductor Type	Cu/Al	Cu	
1.7	Insulation	PILC/ XLPE	PILC & XLPE (As per SLD)	
1.8	Armouring		DSTA for PILC; SWA for XLPE	
1.9	Serving		PVC	
1.10	Full Load Current	A		
1.11	Earth Fault Current	A		
1.12	Bear SANS Mark	Yes/No		
1.13	Compliance with applicable SANS (see Engineering Standard SPE-EP-0017 : MV Cables)	Yes/No	Yes	
2	MEDIUM VOLTAGE CABLE TERMINATION KIT			
2.1	Manufacturer			
2.2	Country of Origin			
2.3	Operating Voltage	kV	11	
2.4	Size	mm ²	95, 185	
2.5	Cable Conductors	Cu/Al	Cu	
2.6	Type of Lugs		Shear-off	
2.7	Full Earth Kit required	Yes/No	Yes	
2.8	Heat Shrink Type required	Yes/No	Yes	
2.9	Complete Kit by one Manufacturer	Yes/No	Yes	
2.10	Type Test Certificate	Yes/No	Yes	
2.11	Bear SANS Mark	Yes/No		
2.12	Compliance with applicable SANS (see Engineering Standard SPE-EP-0017 : MV Cables)	Yes/No	Yes	
3	MEDIUM VOLTAGE CABLE JOINT KIT			
3.1	Manufacturer			
3.2	Country of Origin			
3.3	Operating Voltage	kV	11	
3.4	Size	mm ²	95	
3.5	Cable Conductors	Cu/Al	Cu	
3.6	Type of Ferrules		Shear-off	
3.7	Full Earth Kit required	Yes/No	Yes	
3.8	Type required (Heatshrink / Cast Iron)		Heatshrink	
3.9	Complete Kit by one Manufacturer	Yes/No	Yes	
3.10	Type Test Certificate	Yes/No	Yes	
3.11	Bear SANS Mark	Yes/No		
3.12	Compliance with applicable SANS (see Engineering Standard SPE-EP-0017 : MV Cables)	Yes/No	Yes	
4	INSTALLATION			
4.1	Depth	mm (to cable centre)	800	
4.2	Outdoor Cable Markers	Yes/No	Yes	
5	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements

Name (Print)

Signature:

DETAIL SHEET No. E03
LV CABLE SYSTEMS FOR MOTOR AND EQUIPMENT

[illegible]

Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements

Name (Print) _____ Signature: _____

nature: _____

DETAIL SHEET NO. E04
GENERATOR SET

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	GENSET RATINGS			IW&LSPS USPS DeWatering
1.1	Typical generator power output (COP)	kVA		
1.2	Typical generator power output (PRP)	kVA	1000; 1600	
1.3	Typical generator power output (LTP)	kVA		
2	ENGINE			IW&LSPS USPS DeWatering
2.1	Manufacturer			
2.2	Type			
2.3	Model			
3	FUEL TANK			IW&LSPS USPS DeWatering
3.1	Fuel lines/pipes – type		Black Steel	
3.2	Fuel tank material			
3.3	Fuel tank filter type			
3.4	Fuel tank size:			
3.4.1	Liters	l		
3.4.2	Height	mm		
3.4.3	Length	mm		
3.4.4	Width	mm		
3.5	Hand fuel pump	Yes/No	Yes	
4	EXHAUST TYPE			
4.1	Type of exhaust system		Industrial	
4.2	Exhaust emission tier level		Tier 2	
4.3	Material for lagging		Stainless Steel 316	
5	CANOPY			
5.1	Type of air vents – inlet air flow	m ² / hr		N/A
5.2	Type of air vents – outlet air flow	m ² / hr		N/A
5.3	Canopy – type of material / steel			N/A
5.4	Size of canopy:			N/A
5.4.1	Height	mm		N/A
5.4.2	Length	mm		N/A
5.4.3	Width	mm		N/A
6	ALTERNATOR			IW&LSPS USPS DeWatering
6.1	Make			
6.2	Model			
6.3	Prime power	kVA		
6.4	Standby power	kVA		
6.5	Phase	1 or 3	3	
6.6	Supply Voltage	V	400	
6.7	Supply Frequency	Hz	50	
7	CONTROL PANEL			
7.1	Automatic / Manual		Automatic	
7.2	Remote / Local		Local	
7.3	Type of controller			
7.4	Make of controller			
7.5	Model of controller			
7.6	Remote monitoring	Yes / No	Yes, interface with PLC	
7.7	Automatic Mains Sensing Incorporated	Yes / No	Yes	
7.8	Change over switch incorporated		No, in Assemblies	
8	DUMMY LOADS			
8.1	Dummy loads required	Yes / No	Yes, for genset at Dewatering building	
8.2	Size of Dummy Load	% of Generator Capacity		

[illegible]

DETAIL SHEET No. E05
LV SWITCHGEAR AND CONTROLGEAR ASSEMBLIES - MCCs and Distribution Boards

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	ASSEMBLY CONSTRUCTION			
1.1	Manufacturer			
1.2	Access	Back / Front / Side	Front & Rear	
1.3	Doors / Removable Panels		Doors	
1.4	Hinges	Yes / No	Yes	
1.5	Hinges - Type			
1.6	Hinges - Material		Stainless Steel 316	
1.7	Stays at 95° opening	Yes / No		
1.8	Door Locks	Yes / No		
1.9	Door Locks - Type			
1.10	Door Locks - Material		Stainless Steel 316	
1.11	Door Interlock per compartment	Yes / No	Yes	
1.12	Cable Entry	Top / Bottom	Bottom	
1.13	Size of Panel:			
1.13.1	Height	mm	Max 2100	
1.13.2	Length	mm		
1.13.3	Width	mm		
1.14	Spare Space Required	%	≥10	
1.15	Estimated Weight	kg		
1.16	Type Tested with Stated Deviations to SANS 1973-1	Yes/No	Yes	
1.17	Deviations from original Type Tested Assembly:	Specify		
1.18	Type Test Certificate Required	Yes / No	Yes	
1.19	Motor Starter Circuits	Withdrawable / Fixed	Fixed	
1.20	Ingress Protection (doors closed)	IP	44	
1.21	Form of Internal Separation		3b/4a	
1.22	Method of Installation: Floor standing / Wall mounted / Flush / Pedestal Mounted / Kiosk / Architrave / Surface Mounted		Floor Standing	
1.23	Material of Construction: 1.6mm Mild Steel / 2.0mm Mild Steel / Electro Galvanized / Stainless Steel / 3CR12 / Fibre Glass		3CR12	
1.24	Epoxy Powder Coated	Yes / No	Yes	
1.25	Incomer Section Required	Yes / No	Yes	
1.26	Essential Section Required	Yes / No	No	
1.27	UPS Section Required	Yes / No	No	
1.28	Colour of Assembly:			
1.28.1	Doors		electric orange	
1.28.2	Normal Section		electric orange	
1.28.3	Essential Section		-	
1.28.4	UPS Section		-	
2	COMPONENTS			
2.1	Busbars			
2.1.1	Material		Copper	
2.1.2	Tinned	Yes / No	Yes	
2.1.3	Current Density	A/mm ²	As type test require	
2.2	Air Circuit Breakers			
2.2.1	Manufacturer			
2.2.2	Type		Withdrawable	
2.2.3	Model			
2.2.4	Rated Current	A	As per SLD	
2.2.5	Service short-circuit breaking capacity (Ics)	kA	As per SLD	
2.2.6	Overload release		Electronic	
2.2.7	Short-circuit release		Electronic	

DETAIL SHEET No. E05**LV SWITCHGEAR AND CONTROLGEAR ASSEMBLIES - MCCs and Distribution Boards**

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
2.3	Moulded Case Circuit Breakers			
2.3.1	Manufacturer			
2.3.2	Type		Fixed	
2.3.3	Model			
2.3.4	Rated Current	A	As per SLD	
2.3.5	Service short-circuit breaking capacity (Ics)	kA		
2.3.6	Overload release		Thermal/ electronic	
2.3.7	Short-circuit release		Magnetic/ electronic	
2.4	Miniature Circuit Breakers			
2.4.1	Manufacturer			
2.4.2	Type			
2.4.3	Model			
2.4.4	Rated Current	A		
2.4.5	Service short-circuit breaking capacity (Ics)	kA		
2.4.6	Tripping Curve		C or as per SLD	
2.5	Fuse-Switch-Disconnecter			
2.5.1	Manufacturer			
2.5.2	Model			
2.6	High Rupture Capacity (HRC) Fuse Links			
2.6.1	Manufacturer			
2.6.2	Model			
2.7	Contactors			
2.7.1	Manufacturer			
2.7.2	Model			
2.7.3	Contactor rating		AC3	
2.7.4	Coordination		Type 2	
2.8	Overload Relays			
2.8.1	Manufacturer			
2.8.2	Type			
2.8.3	Model			
2.8.4	Rated Current	A		
2.8.5	Resetable from front of Panel	Yes / No	Yes	
2.9	Miniature Relays			
2.9.1	Manufacturer			
2.9.2	Model			
2.10	Pushbutton and Selector Switches			
2.10.1	Manufacturer			
2.10.2	Model			
2.11	Indicator Lamps			
2.11.1	Manufacturer			
2.11.2	Model			
2.12	Surge Arrestors			
2.12.1	Power Circuits - Manufacturer			
2.12.2	Power Circuits - Model			
2.12.3	Power Circuits - Rating	kA		
2.12.4	Remote Indication	Yes / No		
2.12.5	Control Circuits - Manufacturer			
2.12.6	Control Circuits - Model			
2.12.7	Remote Indication	Yes / No		

LV SWITCHGEAR AND CONTROLGEAR ASSEMBLIES - MCCs and Distribution Boards

Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements

Section 2
Technical Data Sheets
Electrical

DETAIL SHEET No. E06
VARIABLE FREQUENCY CONVERTERS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	GENERAL			
1.1	Manufacturer			
1.2	Model			
1.3	Place of manufacture			
1.4	Expected life (for spares availability)	Years		
2	ELECTRICAL SERVICE CONDITIONS			
2.1	Normal service conditions varied in Project Specification	Yes/No	No	
2.2	Unusual electrical service conditions specified	Yes/No	No	
2.3	Supply network characteristics			
2.3.1	Voltage (nominal)	V	400	
2.3.2	Frequency	Hz	50	
3	ENVIRONMENTAL SERVICE CONDITIONS			
3.1	Standard climatic conditions varied in Project Specification	Yes/No	No	
3.2	Forced ventilation or air conditioning in VFC room	FV/AC	AC	
3.3	Unusual mechanical installation conditions specified	Yes/No	No	
3.4	Unusual environmental service conditions specified	Yes/No	No	
3.5	Airflow required per VFC	m³/s		
3.6	Heatload per VFC	kW		
4	LOAD DETAILS			
4.1	Type of motor-driven load		Centrifugal pumps, conveyors	
4.2	Load torque characteristic		Quadratic	
4.3	Number of operation quadrants		1	
4.4	Dynamic braking required		No	
4.5	Operating speed range		As per mechanical specification	
5	CONVERTER TRANSFORMER			N/A
5.1	Type (oil-filled or dry)			
5.2	Number of secondary windings			
5.3	Primary rated voltage	V		
5.4	Secondary rated voltage	V		
5.5	Rated power	kVA		
5.6	Free-standing (FS) or integral (I) to VFC	FS/I		
5.7	No-load losses	W		
5.8	Load losses	W		
6	CONVERTER CONFIGURATION			
6.1	Form of converter (package/chassis/cabinet unit)		Package	
6.2	Rectifier type: diode- or active front end (DFE/AFE)		DFE	
6.3	Rectifier pulse number		6	
6.4	Bypass/redundancy arrangement specified	Yes/No	No	
6.5	Input air circuit-breaker	Yes/No	No	
6.6	Input switch-disconnector	Yes/No	No	
6.7	Input semi-conductor fuses	Yes/No	Yes	
6.8	Input contactor	Yes/No	Yes	
6.9	Input earthing switch	Yes/No	No	
7	CONVERTER FILTERS			
7.1	Line-side reactor	Yes/No	Yes	
7.2	Line-side reactor relative short-circuit voltage	%		
7.3	Line harmonic filters (LHF)	Yes/No		
7.4	LHF free-standing (FS) or integral to VFC (I)	FS/I		
7.5	Motor-side reactor	Yes/No		
7.6	Motor-side dv/dt filter	Yes/No		
7.7	Motor-side sine filter	Yes/No		
7.8	Motor-side common-mode filter	Yes/No		
8	CONVERTER PROTECTION			
8.1	Overcurrent and overload	Yes/No	Yes	
8.2	Undervoltage and overvoltage	Yes/No	Yes	
8.3	Phase loss and unbalance	Yes/No	Yes	

DETAIL SHEET No. E06
VARIABLE FREQUENCY CONVERTERS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
8.4	Earth fault	Yes/No	Yes	
8.5	Over-temperature	Yes/No	Yes	
8.6	DC link overvoltage and overcurrent	Yes/No	Yes	
8.7	Over-temperature of DC link reactor (if installed)	Yes/No	Yes	
9	MOTOR PROTECTION			NA
9.1	Short-circuit	Yes/No	Yes	
9.2	Start(max starting time)/Stall	Yes/No	Yes	
9.3	Earth fault	Yes/No	Yes	
9.4	Overload	Yes/No	Yes	
9.5	Number of starts	Yes/No	Yes	
9.6	Loss of phase	Yes/No	Yes	
9.7	Unbalance	Yes/No	Yes	
9.8	Loss of load/undercurrent	Yes/No	Yes	
9.9	Thermal by means of motor thermistors/RTDs	Yes/No	Yes	
10	CONVERTER RATINGS			
10.1	Rated system voltage	V	400	
10.2	Line-side rated current	A		
10.3	Input total power factor	pu		
10.4	Line-side displacement power factor	pu		
10.5	Rated continuous output current	A		
10.6	Overload capability and time	A & s		
10.7	Efficiency of complete drive module	%		
10.8	Total losses of complete drive module	W		
11	CONTROL PERFORMANCE REQUIREMENTS			
11.1	Open loop speed control	Yes/No	Yes	
11.2	Steady state deviation band	%	±1 to ±2	
11.3	Closed loop speed control with indirect feedback	Yes/No	No	
11.4	Steady state deviation band	%		
11.5	Closed loop speed control with direct feedback	Yes/No	No	
11.6	Steady state deviation band	%		
12	PROCESS CONTROL INTERFACE			
12.1	Compliant with SANS 61800-7	No/Yes	Yes	
12.2	Communications Interface Quantity	No.		
12.3	Communications Interface Type(s) and Connector(s)	No.		
12.4	Communications Interface Protocol(s)	No.		
12.5	Communications Interface Power Drive System Profile	Process / Drive/ Motion Control	Process	
12.6	Communications Interface Message Structure to SANS 61800-7		Yes	
13	SPECIAL CONTROL FEATURES			
13.1	Automatic restart facility	Yes/No	Yes	
13.2	Flying restart facility	Yes/No	Yes	
13.3	Adjustable ramp times (acceleration/deceleration)	Yes/No	Yes	
13.4	Dip ride-through using load kinetic energy	Yes/No	Yes	
14	TESTING			
	Where indicated the following tests shall be carried out in addition to the specified mandatory tests.			
14.1	Special Tests for Converter			
14.1.1	Overcurrent capability	Yes/No	No	
14.1.2	Measurement of ripple voltage and current	Yes/No	No	
14.1.3	Power factor measurement	Yes/No	No	
14.1.4	Measurement of inherent voltage regulation	Yes/No	No	
14.1.5	Audible noise	Yes/No	No	
14.1.6	Additional tests	Yes/No	No	
14.2	Drive System Site Tests			
14.2.1	Load duty	Yes/No	No	
14.2.2	Allowable full load current versus speed	Yes/No	No	
14.2.3	Temperature rise	Yes/No	No	
14.2.4	Efficiency	Yes/No	No	

DETAIL SHEET No. E06**VARIABLE FREQUENCY CONVERTERS**

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
14.2.5	Current sharing	Yes/No	No	
14.2.6	Voltage division	Yes/No	No	
14.2.7	Shaft current - bearing insulation	Yes/No	No	
14.2.8	Audible noise	Yes/No	No	
14.2.9	Motor vibration	Yes/No	No	
14.2.10	EMC tests	Yes/No	No	
14.2.11	Harmonic content of CDM output	Yes/No	No	
14.2.12	Current limit and current loop	Yes/No	No	
14.2.13	Speed loop	Yes/No	No	
14.2.14	Torque pulsation	Yes/No	No	
14.2.15	Automatic restart	Yes/No	No	
14.2.16	System full load test	Yes/No	No	
14.2.17	Overall drive system efficiency	Yes/No	No	
14.3	Witnessed factory acceptance test	Yes/No	No	

Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements

Name (Print)

Signature:

CITY OF CAPE TOWN

WATER AND SANITATION

CONTRACT NO. 85Q/2016/17

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE CONSTRUCTION OF
PRIMARY TREATMENT AND SLUDGE HANDLING FACILITIES AT ZANDVLIET WASTEWATER
TREATMENT WORKS

SECTION 3

TECHNICAL DATA SHEETS - ELECTRONIC

DETAIL SHEET No. E07
CONTROL, INSTRUMENTATION AND DATA CABLES

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	CONTROL CABLES			
1.1	Manufacturer			
1.2	Size	mm ²	1.5	
1.3	Operating Voltage	V	24VDC/230VAC	
1.4	Number of Cores	No	See Specifications	
1.5	Size	mm ²		
1.6	Conductor Type	Cu/Al		
1.7	Cable Type			
1.8	Full Load Current	A		
1.9	Armouring	Yes/No	Yes, SWA	
2	INSTRUMENTATION CABLES			
2.1	Manufacturer			
2.2	Operating Voltage	V	24VDC/230VAC	
2.3	Size	mm ²	1.5	
2.4	Cable Type		Twisted Pair	
2.5	Screened		Individually and Overall	
2.6	Armouring	Yes/No	Yes	
2.7	Wires	2 Wire / 4 wire	2 wire	
3	CABLE WIRE MESH CABLE TRAY			
3.1	Manufacturer			
3.2	Type		Stainless Steel	
3.3	Material		216	
3.4	Duty	Heavy / Medium	Heavy	
3.5	Application		Instrumentation Cables	
4	FIBRE OPTIC			
4.1	Manufacturer			
4.2	Type		Multimode	
4.3	Armouring	Yes/No	Yes, for all outdoor and exposed cables	
4.3	Cores	Number	12	
5	ETHERNET COPPER CABLES			
5.1	Manufacturer			
5.2	Type		CAT5	
5.3	Armouring	Yes/No	No	
6	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements

Name (Print):

Signature:

DETAIL SHEET No. E08
PROGRAMMABLE LOGIC CONTROLLER

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	PROGRAMMABLE LOGIC CONTROLLERS			
1.1	Manufacturer		Schneider	
1.2	Model		MS400 (upgradable to MS500)	
1.3	Digital Inputs	No.		
1.4	Digital Outputs	No.		
1.5	Analogue Inputs	No.		
1.6	Analogue Outputs	No.		
1.7	Fieldbus Interface	Yes/No	Yes	
1.8	Fieldbus protocol	E.g. Profibus, Modbus		
1.9	ASI Bus Interface	Yes/No	No	
1.7	Spare I/O	%	20%	
1.8	Ports			
1.8.1	Ethernet	No.		
1.8.2	Serial	No.		
1.8.3	Other	No.		
1.9	Software			
1.10	All engineering software included with PLC	Yes / No	Yes	
1.11	Annual Software License renewal required	Yes / No	No, should be once off fee	
1.12	Programming Language		Platform	
1.13	Backplate		Schneider; common X80 I/O module	
1.14	Datasheets included with tender	Yes / No	Yes	
2	PLC PANEL			
2.1	Enclosure Material		3CR12	
2.2	Enclosure Colour		Orange	
2.3	Enclosure Rating	IP	42	
2.4	Enclosure Mounting	Floor Standing / wall mounted	Floor Standing	
2.5	Supply and Control Circuit Voltages	V	230V AC	
2.6	Wire Colours			
2.7	Termination Preferences		Phoenix terminals	
2.8	Glanding preferences		Pratley	
2.9	Power Supply Unit vendor preferences		Phoenix	
2.10	Uninterruptible Power Supply requirement	Yes / No	Phoenix	
2.11	Panel light required	Yes / No	Yes, LED	
2.12	Socket outlet required	Yes / No	Yes	
2.13	IO Voltage / current preferences		24VDC & 4-20mA	
3	HUMAN MACHINE INTERFACE (HMI)			
3.1	Manufacturer		Schneider	
3.2	Model		Magelis	
3.3	Screen Size	Inches	17"	
3.1	Screen Type	Colour/ Monochrome	Colour LCD Display, 256 colors	
3.2	Resolution	Pixels	800 x 600	
3.5	Touch Screen	Yes / No	Yes	
3.6	Type of Touch Screen	Capacitive/ Resistive		
	Touch Screen grid size		(40 x 30 screen grid)	
3.3	Backlight		CFL (50000hrs at 25deg C and 24hr operation)	
3.5	Memory (Flash EPROM)		8 Mbyte	
3.6	Data Backup (SRAM)		512 kilobyte	

DETAIL SHEET No. E08
PROGRAMMABLE LOGIC CONTROLLER

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
3.7	Interfaces Protocol		Serial (11.5 kbps), Ethernet IEEE802.3	
3.8	Interface Port		SUB-DP, RJ45 respectively	
3.9	Sound (for Alarm)		Built in or separate speaker / buzzer	
3.10	Data Transfer		Via 1.44MB Disk or USB Memory Stick	
	Printer Port		Parallel Centronics	
3.7	Enclosure Rating	IP	65	
3.8	Position of Installation	Inside Panel / Flush Fronted / Front Access	Flush Fronted	
3.9	Software			
3.10	Datasheets included with tender	Yes / No	Yes	
4	UPS			
4.1	Manufacturer		RIELLO	
4.2	Model		Sentinel XR	
4.3	Place of manufacture			
4.4	Type		double conversion with full static bypass; floor standing box type	
4.5	Power	W	Load + 30%	
4.6	Backup Time	min	30	
4.7	Output Voltage	V	230V $\pm$ 1.5%	
4.8	Nominal Frequency	Hz	50	
4.9	Output Waveform		Pure sine wave	
4.9	Number of Phases	1 or 3	1	
4.10	Communication		Serial/Ethernet	
4.11	Battery Life	Years	Min 10.	
4.12	Battery Type		Sealed, maintenance free, lead acid contained in UPS	
4.13	Datasheets included with tender	Yes / No	Yes	
5	NETWORK SWITCHES			
5.1	Manufacturer			
5.2	Model			
5.3	Type		Industrial	
6	PATCH PANELS			
6.1	Manufacturer			
6.2	Model			
6.3	Type			
7	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements

Name (Print)

Signature: _____

DETAIL SHEET No. E09
SCADA

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	DESKTOP COMPUTER			
1.1	Manufacturer			
1.2	Model			
1.3	CPU			
1.3.1	Type		Similar or equal to Intel I7	
1.3.2	Speed	GHz	>3GHz	
1.4	Memory	MB	>=8000	
1.5	Hard Drive Storage	GB	>200	
1.6	Operating System		MS Windows	
1.8	Optical Storage		DVD-RW	
1.9	Network Card		Ethernet 10/100/1000	
1.10	Graphics Card		>256MB, Dual output to drive 1 x 23" & 1 x 50" display	
1.11	Keyboard		Yes	
1.12	Mouse		Yes	
2	HOT-STANDBY SERVER			N.A
2.1	Manufacturer			
2.2	Model			
2.3	CPU			
2.3.1	Type		Similar or equal to Intel I7	
2.3.2	Speed	GHz	>3GHz	
2.4	Memory	MB	>=8000	
2.5	Hard Drive Storage	GB	>200	
2.6	Motherboard		motherboard, conformal coating	
2.7	Hard drives		Raid hot swappable	
2.8	Power supplies		Raid hot swappable	
2.9	Operating System		Windows 7 server	
2.10	Optical Storage		DVD-RW	
2.11	Network Card		Ethernet 10/100/1000	
2.12	Graphics Card		>256MB, Dual output to drive 1 x 23"	
2.13	Keyboard		Yes	
2.14	Mouse		Yes	
3	DISPLAY(23",50")			
3.1	Manufacturer			
3.2	Model			
3.3	Type		HD LED / LCD (23"), HD LED/ LCD (50")	
3.4	Size		1 x 23",1 x50"	
4	SOFTWARE			
4.1	SCADA software		UI	
4.2	Amount of Tags	No.		
4.3	Clients	No.	4	
4.4	Anti-Virus Software		Yes	
4.5	Additional Reporting and Business Intelligence		Yes	
4.6	Alarm Management Package		Yes	

DETAIL SHEET No. E10
INSTRUMENTATION

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	ULTRASONIC LEVEL METER			
1.1	Manufacturer			
1.2	Sensor Model			
1.3	Transmitter Model			
1.4	Number of Relay outputs	No.	>=4	
1.5	Detection Range	m		
1.6	Fieldbus Enabled	Yes / No	Yes	
1.7	Surge Protection Required	Yes / No	Yes	
1.8	Local Indication Required	Yes / No	Yes	
1.9	Additional datasheet from manufacturer included with tender	Yes / No	Yes	
2	ELECTROMAGNETIC FLOW METERS			
2.1	Manufacturer			
2.2	Model			
2.3	Flange Size	mm / DN	Various	
2.4	Flow range	m ³ /hr	Various	
2.5	PN Rating		Various	
2.6	Number of Relay outputs	No.		
2.7	Fieldbus Enabled	Yes / No	Yes	
2.8	Local Indication Required	Yes / No	Yes	
2.9	Surge Protection Required	Yes / No	Yes	
2.10	Additional datasheet from manufacturer included with tender	Yes / No	Yes	
3	SOLIDS DENSITY METER			
3.1	Manufacturer			
3.2	Sensor Model			
3.3	Transmitter Model			
3.4	Number of Relay outputs	No.	>=2	
3.5	Detection Range	mg/l		
3.6	Fieldbus Enabled	Yes / No	Yes	
3.7	Surge Protection Required	Yes / No	Yes	
3.8	Local Indication Required	Yes / No	Yes	
3.9	Additional datasheet from manufacturer included with tender	Yes / No	Yes	
4	PRESSURE TRANSMITTERS			
4.1	Manufacturer			
4.2	Sensor Model			
4.3	Transmitter Model			
4.4	Detection Range	kPa		
4.5	Number of Relay outputs	No.		
4.6	Fieldbus Enabled	Yes / No	Yes	
4.7	Surge Protection Required	Yes / No	Yes	
4.8	Local Indication Required	Yes / No	No	
4.9	Additional datasheet from manufacturer included with tender	Yes / No	Yes	
5	LEVEL SWITCHES: FLOAT			
5.1	Manufacturer			
5.2	Model			
5.3	Type			
6	TORQUE SWITCHES			
6.1	Manufacturer			
6.2	Model			
6.3	Type		Inductive Proxy	
7	LIMIT SWITCHES			
7.1	Manufacturer			
7.2	Model			
7.3	Type		Inductive Proxy	

DETAIL SHEET No. E10
INSTRUMENTATION

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
8	PRESSURE SWITCHES			
8.1	Manufacturer			
8.2	Model			
8.3	Type			
9	FLOW SWITCHES			
9.1	Manufacturer			
9.2	Model			
9.3	Type			
10	PRESSURE TRANSMITTERS			
10.1	Manufacturer			
10.2	Sensor Model			
10.3	Transmitter Model			
10.4	Detection Range	kPa		
10.5	Number of Relay outputs	No.		
10.6	Fieldbus Enabled	Yes / No	Yes	
10.7	Surge Protection Required	Yes / No	Yes	
10.8	Local Indication Required	Yes / No	No	
10.9	Additional datasheet from manufacturer included with tender	Yes / No	Yes	
11	SURGE PROTECTION			
11.1	Instrument Power Supply Circuits - Manufacturer			
11.2	Instrument Power Supply Circuits - Model			
11.3	Instrument Signal Loop - Manufacturer			
11.4	Instrument Signal Loop Circuits - Model			
11.5	Instrument Transducer Loop - Manufacturer			
11.6	Instrument Transducer Loop Circuits - Model			
12	INSTRUMENT AND CONTROL CABLE JUNCTION BOXES			
12.1	Manufacturer			
12.2	Material of Construction: 1.6mm Mild Steel / 2.0mm Mild Steel / Electro Galvanized / Stainless Steel / 3CR12 / Fibre Glass		3CR12	
12.3	Epoxy Powder Coated	Yes / No	Yes	
12.4	Colour		Electric Orange	
12.5	IP Rating (Indoor)	IP	65	
12.6	IP Rating (Outdoor)	IP	65	
13	INSTRUMENT TRANSMITTER HOUSINGS			
13.1	Manufacturer			
13.2	Material of Construction: 1.6mm Mild Steel / 2.0mm Mild Steel / Electro Galvanized / Stainless Steel / 3CR12 / Fibre Glass		3CR12	
13.3	Epoxy Powder Coated	Yes / No	Yes	
13.4	Colour		Electric Orange	
13.5	IP Rating (Indoor)	IP	N/A	
13.6	IP Rating (Outdoor)	IP	65	
14	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements

Name (Print): _____

Signature: _____