

CONTRACT NO : RFP047/2025  
CONSTRUCTION OF PHASE 1 ROOIWAL WWTW

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## **PART 3: ELECTRICAL AND MECHANICAL NORTH AND WEST WORKS BOQ**



**CITY OF TSHWANE**  
**CONTRACT NO : RFP047/2025**  
**CONSTRUCTION OF PHASE 1 ROOIWAL WWTW NORTH AND WEST WORKS**  
**ELECTRICAL AND MECHANICAL FINAL SUMMARY**

ITEM	DESCRIPTION	AMOUNT
1	PRELIMINARY AND GENERAL	
2	PROVISIONAL SUMS	
3	ELECTRICAL WORKS	
4	MECHANICAL WORKS	
	SUBTOTAL (A)	
	The following sums will be under the sole control of the Engineer and may be deducted in part or full.	
	ADD CONTINGENCY 10%	
	SUBTOTAL (B)	
	Contractor to allow 5% for CIDB Built Programme	
	SUBTOTAL (C)	
	EPWP TRAINING	
	Allow for EPWP Training	R1,000,000.00
	SUBTOTAL Excl VAT	
	ADD VAT (15%)	
<b>TOTAL CARRIED TO FORM OF OFFER</b>		

**CITY OF TSHWANE**  
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**ELECTRICAL AND MECHANICAL FINAL SUMMARY**

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<p><b><u>SCHEDULED ESTABLISHMENT, OVERHEADS &amp; INCIDENTAL COSTS</u></b></p> <p><b>NOTES</b>  The supply, installation, testing, commissioning and a 52 week defects liability period in accordance with this bill of material, Local Supply Authority's by-laws &amp; regulations, National Building Regulations, detailed electrical specification, SANS 10142-1: 2003 (Code of Practice), Occupational Health and Safety Act, General Conditions of Contract and drawings listed in the detailed specification.</p> <p>1.The rates and/or prices for items scheduled in this Section under the headings - ONCE-OFF ESTABLISHMENT COST - DE-ESTABLISHMENT COST and - ONGOING OPERATIONAL AND OVERHEAD COST include everything to cover the Contractor's direct costs, overheads, profit and expenses required for all risks, liabilities and obligations in terms of this contract. (excluding VAT) 2.The rates and/or prices for items scheduled in this section under the heading "INCIDENTAL EXPENDITURE PROVISIONS" must be priced in this framework tender. The Contractor hereby agrees that these rates will be used for compensation event cost calculation and pricing where applicable instead of Defined Cost, unless otherwise decided by the Employer, at the Employer's sole discretion. Any items not priced are deemed to be included 3.Lump sum prices in this section are fixed for the contract, and are not subject to adjustment in compensation event assessments.</p>				

1	<b><u>ONCE-OFF ESTABLISHMENT COST</u></b>				
	(Claimable for payment upon completion of all related activities associated with each item)				
	<b><u>Contractual Requirements</u></b>				
1.1	Compliance with all clauses of the Contract and Works Information	Sum	1		
1.2	Compliance with the law, regulations and by laws	Sum	1		
1.3	Compliance of tender participation goal in respect of local resources as per items in annexure 5	Sum	1		
1.4	Compliance with the stipulations of the Environmental Specification	Sum	1		
1.5	Insurance and liabilities	Sum	1		
1.6	Performance bond	Sum	1		
	<b><u>Establish Facilities on the Site</u></b>				
	<b><u>Facilities for Project Manager</u></b>				
1.7	Air conditioned office accommodation with suitable tables and chairs for meetings to be held on the site	Sum	1		
1.8	Contract name board - Refer to WCG Guidelines	Sum	1		
	<b><u>Facilities for Contractor</u></b>				
1.9	Offices (shared with Project Manager)	Sum	1		
1.10	Workshops	Sum	1		
1.11	Laboratories	Sum	1		
1.12	Ablutions and latrine facilities	Sum	1		
1.13	Tools and equipment	Sum	1		
1.14	Water supply	Sum	1		

1.15	Electricity supply	Sum	1		
1.16	Communication	Sum	1		
	<b>DE-ESTABLISHMENT COST</b>				
	Costs for complete removal of site establishment and restoration of the site to the Project Mangers satisfaction at the end of the contract:		1		
1.17		Sum			
2	<b>ONGOING OPERATIONAL AND OVERHEAD COST</b>				
	<u>Claimable for payment as a time-related cost during execution of the contract</u>				
	<b>Contractual Requirements</b>				
2.1	Compliance with all clauses of the Contract and Works Information	Sum	1		
2.2	Compliance with the law, regulations and by laws	Sum	1		
2.3	Compliance of tender participation goal in respect of local resources as per items in annexure 5	Sum	1		
2.4	Insurance and liabilities	Sum	1		
2.5	Performance bond	Sum	1		
2.6	Facilities for Project Manager				
2.7	Air conditioned office accommodation with suitable tables and chairs for meetings to be held on the site	Sum	1		
2.8	Facilities for Contractor				
2.9	Offices (shared with Project Manager)	Sum	1		
2.10	Workshops	Sum	1		
2.11	Laboratories	Sum	1		
2.12	Ablutions and latrine facilities	Sum	1		
2.13	Tools and equipment	Sum	1		

2.14	Water supply	Sum	1		
2.15	Electricity supply	Sum	1		
2.16	Communication	Sum	1		
2.17	Provisional sum for salary for the Resident Engineer	sum	1	R2,673,000.00	R2,673,000.00
2.18	Profit and attendance on item 3.9	%		R2,673,000.00	
2.19	Company and head office costs	Sum	1		
3	<b><u>INCIDENTAL EXPENDITURE PROVISIONS</u></b>				
	<p><u>The quantities listed are included for tender evaluation purposes only, and do not reflect actual quantities envisaged for the project.</u></p> <p><u>The rates offered shall apply for compensation event pricing for the duration of the contract where applicable</u></p>				
	<p>All compensation event costs related to people are allocated according to the breakdown of categories below (or nearest matching category, if no exact description match). The following rate adjustments will apply for after hours work: Weekdays after hours and Saturdays - Rate X 1.5 Sundays and Public Holidays - Rate X 2</p>				
3.1	Contract/Project Manager	Days			Rate
3.2	Site Manager	Days			rate
3.3	Safety Officer	Days			rate
3.4	Site Foreman (General Supervisor)	Days			rate
3.5	Foreman (Supervisor)	Days			rate
3.6	Administrative clerk	Days			rate
3.7	Skilled Artisan	Days			rate
3.8	Semi-Skilled Artisan	Days			rate

<b>4</b>	<b>PROJECT SPECIFIC PRELIMINARIES</b>					
4.1	Workshop Drawings	Sum	1			
4.2	As built Drawings	Sum	1			
4.3	Training of Staff	Sum	1			
4.4	Operating and Maintenance Manuals	Sum	1			
4.5	One year Maintenance Guarantee	Sum	1			
<b>5</b>	<b>Occupational Health and Safety</b>					
5.1	<u>General safety obligations</u>					
5.1.1	Mandatory Signage / Road signs	Sum	1			
5.1.2	Safety Poster including Acts & Regulations	Sum	1			
5.1.3	Safety office / shed or container for the duration of the contract	Sum	1			
5.1.4	Allowance for toilets (Gender specific)	Each	3			
5.1.5	Lay down & storage areas	Sum	1			
5.1.6	Employee eating area	Sum	1			
5.1.7	Hand washing & sanitizing stations	Sum	1			
5.1.8	Compliance with the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification for the duration of the contract	Sum	1			
5.2	<b>Safety Planning</b>					
5.2.1	Safety file and Risk Assessment	Sum	1			
5.2.2	Health and safety plan	Sum	1			
5.2.3	Medical assessment of employees (Entrance & Exit) & Vaccines for employees working within sewer	Sum	1			
5.2.4	Fall Protection Plan	Sum	1			
5.2.5	Traffic Management Plan	Sum	1			



5.3	<b>Safety Personnel</b>					
5.3.1	Construction safety officer (Full time)	Month	12			
5.3.2	Work overalls - Reflective Conti suits (Min 2 pairs each)	Each	50			
5.3.3	Safety Shoes	Each	50			
5.3.4	Gum Boots	Each	50			
5.3.5	Hardhats	Each	50			
5.3.6	Reflective vests	Each	50			
5.3.7	Ear Plugs (100's)	Box	10			
5.3.8	Ear Muffs	Each	50			
5.3.9	Full body Safety Harness (Double lanyard)	Each	2			
5.3.10	Life Lines	Each	2			
5.3.11	Dust / Cloth Masks (100s)	Box	100			
5.3.12	Eye protection (Safety Glasses)	Each	60			
5.3.13	Hand Protection (Gloves) 100pcs	Bulk	50			
5.3.14	Barricade Netting (1 x 50m)	Sum	1			
5.3.15	Edge protection material & equipment	Sum	1			
5.3.16	Fire Extinguishers (9kg)	Each	2			
5.3.17	First Aid box (GR3 kit). Including refill kits required.	Each	2			
5.3.18	Spill kit (120litre)	Each	2			
5.3.19	Lock out items (locks, tags,safes, etc..)	Sum	1			
5.3.20	Emergency air siren	Each	2			
5.3.21	Rescue equipment	Sum	1			
	<b>Total Preliminaries</b>					

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**ELECTRICAL AND MECHANICAL FINAL SUMMARY**

	Description	Unit	Qty	Rate	Total
	Provisionals and Generals				
	<b>Provisionals</b>				
1	Provision of refurbishment at Trickling Filter Plant	sum	1	R4,000,000.00	R4,000,000.00
2	Provision for refurbishments at Humus Tanks	sum	1	R1,500,000.00	R1,500,000.00
3	Provision for repairs to the effluent Pumpstation	sum	1	R1,500,000.00	R1,500,000.00
4	Provision for repairs for the digested sludge pipeline to sump	sum	1	R800,000.00	R800,000.00
5	Provision for repairs of the digested sludge pipeline to the lagoons	sum	1	R500,000.00	R500,000.00
6	Provision for Fire Safety Related Work	sum	1	R150,000.00	R150,000.00
7	Provision for Ventilation Related Work	sum	1	R150,000.00	R150,000.00
8	Provision for Access ,dewatering and drainage related Services Related Work	sum	1	R800,000.00	R800,000.00
9	Provision for Cleaning,sludge and Waste Disposal Work	sum	1	R1,200,000.00	R1,200,000.00
10	PLC programming and HMI / SCADA configuration and Relocation to new Office Room	sum	1	R3,100,000.00	R3,100,000.00
11	Lightning Protection System	sum	1	R1,800,000.00	R1,800,000.00
12	MV Equipment & Switchgear Repair & Upgrade	sum	1	R4,200,000.00	R4,200,000.00
13	Rerfubishment of 16 X Highmast Light Structures & Kiosks	sum	1	R1,950,000.00	R1,950,000.00
14	East & West Balancing Tanks Electrical Works	sum	1	R2,350,000.00	R2,350,000.00

15	Environmental management during construction:	sum	1	R875,000.00	R875,000.00
15	Provisional sum for salary of CLO and travel assistance of Project Steering Committee Members appointed by Employer	sum	1	R96,000.00	R96,000.00
16	Profit and attendance on item 3.9	%		R96,000.00	
17	Provision for Repairs and moving of existing services to be confirmed onsite	sum	1	R1,600,000.00	R1,600,000.00
	Subtotal Provisionals				

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**ELECTRICAL FINAL SUMMARY**

<b>SCHEDULE</b>	<b>DESCRIPTION</b>	<b>TOTAL LABOUR</b>	<b>TOTAL MATERIAL</b>
Schedule 1:	North Inlet PST Works		
Schedule 2:	North Inlet Incinerator Building		
Schedule 3:	North Reactors & SSTs		
Schedule 4:	North Chlorine & Final Effluent Dam		
Schedule 5:	West Works		
Schedule 6:	WAS & Dewatering Works		
Schedule 7:	IT Networks (Fibre)		
<b>Total Labour and Material</b>			
<b>TOTAL CARRIED FORWARD TO FINAL SUMMARY PAGE</b>			

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**ELECTRICAL**

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
<b>2</b>	<b>Schedule No 1 NORTH WORKS - INLET WORKS</b>						
2.1	250A, 30kA three pole circuit breaker complete to be installed into existing Balancing Tank M/S.	No	1				
2.2	Design , Manufacture, supply, off loading, installation & Commissioning of new PST MCC as shown in the specifications and drawings. The MCC comprises of the following Equip.	No	1				
a	1 x 250A 15kA three phase circuit breaker.						
b	2 x 60A three phase circuit breaker (Local DB & PST DB)						
c	14 x DOL starter drives (6 x PST Drives, 6 x Grit Classifiers & 2 x Washer Presses)						
d	3 x 10A single pole circuit breakers (lights & PLC)						
e	1 x single phase contactor (lights)						
f	1 x 2A single pole circuit breaker (contactor / photo cell).						
g	1 x 30mA single phase 60A earth leakage unit (plugs).						
h	2 x 20A single pole circuit breakers (plugs)						
i	4 x surge arrestors (main).						
j	1 x 3 phase voltage selector switch						
k	1 x volt meter						
l	3 x 250 / 5 A CT's						
m	3 x maximum demand amp meters						
n	1 x 300mA 3 phase 30A earth leakage unit (welding socket)						
o	1 X 3 Phase Power Meter						

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
2.3	<b>LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere):</b>						
a	120mm <sup>2</sup> x 4 core (MCC supply)	m	60				
b	95mm <sup>2</sup> Kwena earthing conductor	m	60				
c	16mm <sup>2</sup> x 4 core (PST DB)	m	20				
d	4mm <sup>2</sup> x 4 core (PST Drive cable)	m	350				
e	4mm <sup>2</sup> x 4 core (Grit Classifier cable)	m	420				
e	6mm <sup>2</sup> x 4 core (welding socket)	m	170				
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	m	120				
3.4	<b>LV CABLE TERMINATION: PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor &amp; earth termination, lugs, tapes, drilling etc</b>						
a	120mm <sup>2</sup> x 4 core (MCC supply)	No	2				
b	95mm <sup>2</sup> Kwena earthing conductor	No	2				
c	16mm <sup>2</sup> x 4 core (PST DB)	No	2				
d	4mm <sup>2</sup> x 4 core (PST Drive cable)	No	12				
e	4mm <sup>2</sup> x 4 core (Grit Classifier cable)	No	12				
e	6mm <sup>2</sup> x 4 core (welding socket)	No	8				
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	No	10				
3.5	<b>CABLE EXCAVATION:</b>						
a	Pickable material	m <sup>3</sup>	100				
b	Soft Rock	m <sup>3</sup>	52				
c	Hard Rock	m <sup>3</sup>	50				
d	Backfilling & Compaction	m <sup>3</sup>	202				
3.6	<b>CABLE ROUTE MARKERS: The supply and installation of concrete cable route markers</b>	No	10				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
3.7	CABLE LADDER AND TRAY: OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / walls.						
a	100mm cable ladder	m	15				
b	100mm 90° bends	No	2				
c	T - Bends	No	10				
c	100mm duplex coating 3CR12 cable tray.	m	90				
3.8	LOCAL EMERGENCY STOP STATIONS:						
a	Surface mounted IP65 emergency stop push buttons.	No	18				
b	Stainless Steel support stands Emergency Stop/Start Buttons	No	18				
3.9	Surface mounted 35A, 5 pin 3 phase welding socket including male plug, IP65. (Wall Mounted)	No	15				
	<b>LIGHTING AND SMALL POWER</b>						
3.1	GALVANISED CONDUIT:						
a	Surface mounted 20mm galvanised conduit including couplings, galvanised saddles and all accessories.	m	80				
c	Surface mounted round galvanised 20mm conduit boxes including galvanised cover plate.	No	16				
3.1	PHOTO CELL:						
a	Royce Thompson photo cell including conduit box.	No	1				
3.1	WIRING PVC insulated copper conductors drawn into galvanised conduit:						
a	1.5mm2	m					
b	2.5mm2	m	100				
c	4.0mm2	m	150				
d	6.0mm2	m	40				
3.1	EARTH WIRING BCEW drawn into galvanised conduit:						
a	1.5mm2	m					
b	2.5mm2	m	40				
c	4.0mm2	m	50				

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
d	6.0mm2	m	20				
3.1	LUMINAIRES To be mounted to suspended ceilings and to brick walls:						
a	2 x 36W IP65 vapour proof LED luminaire complete Driver.	No	4				
b	2 x 36W IP65 vapour proof LED Emergency Maintained luminaire complete Driver.	No	2				
c	2 x 18W LED compact Outdoor bulkhead luminaire complete with Driver	No	2				
d	2 x 100W LED Floodlight with Driver Mounted on a 5.7m Stainless Steel Mast	No	3				
3.2	SOCKET OUTLETS Industrial surface mounted 16A single switched socket outlets.	No	1				
3.2	IDENTIFICATION & DETECTION OF EXISTING ELECTRICAL AND COMMUNICATION CABLES	Sum	1				
3.2	Relocation and replacement of Electrical (Mv & LV) and communication cables including trenching, decommissioning of old cables and transport to Tshwane Stores.	Sum	1				
<b>TOTAL CARRIED FORWARD TO SUMMARY</b>							



**CITY OF TSHWANE**  
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**CONSTRUCTION OF PHASE 1 ROOIWAL WWTW NORTH AND WEST WORKS**  
**ELECTRICAL**

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
				LABOUR	MATERIAL	LABOUR	MATERIAL
<b>1</b>	<b>Schedule No 1 NORTH WORKS - INLET WORKS</b>						
1.1	Decommission and Deliver to Tshwane Stores old RMU, Transformer & Kiosk. Rehabilitate the grounds	No	1				
1.2	Refurbish existing MCC by Repalcing Aux. Equipment (New Power Meter, Ammeters, Voltmeters, Hour Meters) and rewire existing MCC as shown in the specifications and drawings(Single Line Diagrams). The refurbishment works are stated in the Scope of Works Document.	No	1				
<b>3.3</b>	<b>Generator and ATS</b>						
a	500kVA Generator Set Complete with ATS, ,PIInth and 48 hour Diesel Backup Tank	m	1				
<b>3.3</b>	<b>LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere):</b>						
a	16mm2 x 4 core (Incinerator Blg. DB)	m	45				
b	4mm2 x 4 core	m					
c	6mm2 x 4 core (welding socket)	m	80				
d	1.5mm2 x 3 core (emergency stop cable)	m	90				
<b>3.4</b>	<b>LV CABLE TERMINATION: PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor &amp; earth termination, lugs, tapes, drilling etc</b>						
a	16mm2 x 4 core (IncineratorDB)	No	2				
b	4mm2 x 4 core	No					

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
c	6mm2 x 4 core (welding socket)	No	8				
d	1.5mm2 x 3 core (emergency stop cable)	No	8				
3.5	CABLE EXCAVATION:						
a	Pickable material	m <sup>3</sup>	10				
b	Soft Rock	m <sup>3</sup>	5				
c	Hard Rock	m <sup>3</sup>	5				
d	Backfilling & Compaction	m <sup>3</sup>	20				
3.6	CABLE ROUTE MARKERS: The supply and installation of concrete cable route markers	No	4				
3.7	CABLE LADDER AND TRAY: OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / walls.						
a	100mm cable ladder	m					
b	100mm 90° bends	No	1				
c	T - Bends	No					
c	100mm duplex coating 3CR12 cable tray.	m	40				
3.8	LOCAL EMERGENCY STOP STATIONS:						
a	Surface mounted IP65 emergency stop push buttons.	No	5				
b	Stainless Steel support stands Emergency Stop/Start Buttons	No	5				
3.9	Surface mounted 35A, 5 pin 3 phase welding socket including male plug, IP65. (Wall Mounted/Station Mounted)	No	4				
5.2	DIFFERENTIAL ULTRASONIC LEVEL DETECTOR: (Inlet Works in & Outflow)						
a	FDU92 level sensor including 20m of cable.	No	2				
b	304 stainless steel support bracket for the sensor head.	No	2				
c	FMU90 ultrasonic level transmitter.	No	2				
d	Programming of the ultrasonic level transmitter.	No	2				

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
e	FEB for the transmitter including terminals, surge arrestors, circuit breaker & stainless steel pedestal.	No	2				
	<b>LIGHTING AND SMALL POWER</b>						
3.1	<b>GALVANISED CONDUIT:</b>						
a	Surface mounted 20mm galvanised conduit including couplings, galvanised saddles and all accessories.	m	120				
c	Surface mounted round galvanised 20mm conduit boxes including galvanised cover plate.	No	42				
3.1	<b>PHOTO CELL:</b>						
a	Royce Thompson photo cell including conduit box.	No	1				
3.1	<b>WIRING PVC insulated copper conductors drawn into galvanised conduit:</b>						
a	1.5mm2	m					
b	2.5mm2	m	360				
c	4.0mm2	m	400				
d	6.0mm2	m	240				
3.1	<b>EARTH WIRING BCEW drawn into galvanised conduit:</b>						
a	1.5mm2	m					
b	2.5mm2	m	120				
c	4.0mm2	m	140				
d	6.0mm2	m	80				
3.1	<b>LUMINAIRES To be mounted to suspended ceilings and to brick walls:</b>						
a	2 x 36W IP65 vapour proof LED luminaire complete Driver.	No	4				
b	2 x 36W IP65 vapour proof LED Emergency Maintained luminaire complete Driver.	No	2				
c	2 x 18W LED compact Outdoor bulkhead luminaire complete with Driver	No	4				
d	2 x 50W LED Floodlight with Driver Mounted on a 3.5m Stainless Steel Mast	No	6				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
3.2	LIGHT SWITCHES Industrial surface mounted 16A single lever one way switch.	No	2				
3.2	SOCKET OUTLETS Industrial surface mounted 16A single switched socket outlets.	No	1				
TOTAL CARRIED FORWARD TO SUMMARY							

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**ELECTRICAL**

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
<b>2</b>	<b>Schedule No 1 NORTH WORKS - INLET WORKS</b>						
2.1	300A, 30kA three pole circuit breaker complete to be installed in existing Blower House M/S DB to Return Screw P/S 1 to 3	No	3				
2.2	Design , Manufacture, supply, off loading, installation & Commissioning of new Reactor 1 & 2 Return Cycle Pumps MCC as shown in the specifications and drawings. The MCC(Located in Hums P/S No.1) comprises of the Equip as per SLD RWWTW-E-BNR-01.	No	1				
2.2	Design , Manufacture, supply, off loading, installation & Commissioning of new Reactor 3 Return Cycle Pumps MCC as shown in the specifications and drawings. The MCC(Located in Hums P/S No.1) comprises of the Equip as per SLD RWWTW-E-BNR-02.	No	1				
1.2	Refurbish existing MCC by Repalcing Aux. Equipment (New Power Meter, Ammeters, Voltmeters, Hour Meters) and rewire existing MCCs(Return Scree P/S 1 to 3) as shown in the specifications and drawings(Single Line Diagrams). The refurbishment works are stated in the Scope of Works Document.	No	3				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
2.3	<b>LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere):</b>						
a	300mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC (MCC supply)[Return Screw P/Stations Cable]	m	600				
b	150mm <sup>2</sup> Kwena earthing conductor	m	600				
a	185mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC (MCC supply) [Humus p/s Cable for Internal Screw Pumps MCCs]	m	410				
b	95mm <sup>2</sup> Kwena earthing conductor	m	410				
c	16mm <sup>2</sup> x 4 core (Local DB Cable)	m	100				
d	10mm <sup>2</sup> x 4 core (Internal Recycl Pumps cable)	m	2050				
e	4mm <sup>2</sup> x 4 core (cable)	m					
e	6mm <sup>2</sup> x 4 core (welding socket)	m	390				
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	m	2000				
3.4	<b>LV CABLE TERMINATION: PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor &amp; earth termination, lugs, tapes, drilling etc</b>						
a	300mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC (MCC supply)[Return Screw P/Stations Cable]	No	6				
b	150mm <sup>2</sup> Kwena earthing conductor	No	6				
	185mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC (MCC supply) [Humus p/s Cable for Internal Screw Pumps MCCs]	No	4				
	95mm <sup>2</sup> Kwena earthing conductor	No	4				
c	16mm <sup>2</sup> x 4 core (Local DB Cable)	No	10				
d	10mm <sup>2</sup> x 4 core (Internal Recycl Pumps cable)	No	12				
e	4mm <sup>2</sup> x 4 core (cable)	No					
e	6mm <sup>2</sup> x 4 core (welding socket)	No	18				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
f	1.5mm2 x 3 core (emergency stop cable)	No	36				
3.5	CABLE EXCAVATION:						
a	Pickable material	m <sup>3</sup>	360				
b	Soft Rock	m <sup>3</sup>	50				
c	Hard Rock	m <sup>3</sup>	50				
d	Backfilling & Compaction	m <sup>3</sup>	460				
3.6	CABLE ROUTE MARKERS: The supply and installation of concrete cable route markers	No	12				
3.7	CABLE LADDER AND TRAY: OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / walls.						
a	100mm cable ladder	m	60				
b	100mm 90° bends	No	12				
c	T - Bends	No	12				
c	100mm duplex coating 3CR12 cable tray.	m	1100				
3.8	LOCAL EMERGENCY STOP STATIONS:						
a	Surface mounted IP65 emergency stop push buttons.	No	27				
b	Stainless Steel support stands Emergency Stop/Start Buttons	No	27				
3.9	Surface mounted 35A, 5 pin 3 phase welding socket including male plug, IP65. (Wall Mounted)	No	9				
3.1	<b>LIGHTING AND SMALL POWER</b> GALVANISED CONDUIT:						
a	Surface mounted 20mm galvanised conduit including couplings, galvanised saddles and all accessories.	m	360				
c	Surface mounted round galvanised 20mm conduit boxes including galvanised cover plate.	No	72				
3.1	PHOTO CELL:						
a	Royce Thompson photo cell including conduit box.	No	5				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
3.1	WIRING PVC insulated copper conductors drawn into galvanised conduit:						
a	1.5mm2	m					
b	2.5mm2	m	400				
c	4.0mm2	m	600				
d	6.0mm2	m	160				
3.1	EARTH WIRING BCEW drawn into galvanised conduit:						
a	1.5mm2	m					
b	2.5mm2	m	140				
c	4.0mm2	m	200				
d	6.0mm2	m	60				
3.1	LUMINAIRES To be mounted to suspended ceilings and to brick walls:						
a	2 x 36W IP65 vapour proof LED luminaire complete Driver.	No	20				
b	2 x 36W IP65 vapour proof LED Emergency Maintained luminaire complete Driver.	No	10				
c	2 x 18W LED compact Outdoor bulkhead luminaire complete with Driver	No	12				
d	2 x 100W LED Floodlight with Driver Mounted on a 3.5m Stainless Steel Mast	No	9				
d	2 x 100W LED Floodlight with Driver Mounted on a 5.7m Stainless Steel Mast	No	60				
3.2	SOCKET OUTLETS Industrial surface mounted 16A single switched socket outlets.	No	5				
TOTAL CARRIED FORWARD TO SUMMARY							



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ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
<b>2</b>	<b>Schedule No 1 NORTH WORKS - INLET WORKS</b>						
2.1	400A, 30kA three pole circuit breaker complete to be installed in existing Blower House M/S DB to Return Screw P/S 1 to 3	No	1				
2.2	Design , Manufacture, supply, off loading, installation & Commissioning of new Reactor 1 & 2 Return Cycle Pumps MCC as shown in the specifications and drawings. The MCC(Located in Hums P/S No.1) comprises of the Equip as per SLD RWWTW-E-BNR-01.	No	1				
<b>2.3</b>	<b>LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere):</b>						
a	300mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC (MCC supply) Cable	m	120				
b	150mm <sup>2</sup> Kwena earthing conductor	m	120				
a	185mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC	m	240				
b	95mm <sup>2</sup> Kwena earthing conductor	m	240				
c	16mm <sup>2</sup> x 4 core (Local DB Cable)	m	30				
d	10mm <sup>2</sup> x 4 core	m	120				
e	4mm <sup>2</sup> x 4 core (cable)	m	60				
e	6mm <sup>2</sup> x 4 core (welding socket)	m	60				
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	m	400				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
3.4	LV CABLE TERMINATION: PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc						
a	300mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC	No	2				
b	150mm <sup>2</sup> Kwena earthing conductor	No	2				
	185mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC	No	8				
	95mm <sup>2</sup> Kwena earthing conductor	No	8				
c	16mm <sup>2</sup> x 4 core (Local DB Cable)	No	2				
d	10mm <sup>2</sup> x 4 core	No	4				
e	4mm <sup>2</sup> x 4 core (cable)	No					
e	6mm <sup>2</sup> x 4 core (welding socket)	No	6				
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	No	12				
3.5	CABLE EXCAVATION:						
a	Pickable material	m <sup>3</sup>	60				
b	Soft Rock	m <sup>3</sup>	15				
c	Hard Rock	m <sup>3</sup>	15				
d	Backfilling & Compaction	m <sup>3</sup>	90				
3.6	CABLE ROUTE MARKERS: The supply and installation of concrete cable route markers	No	10				
3.7	CABLE LADDER AND TRAY: OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / walls.						
a	100mm cable ladder	m	40				
b	100mm 90° bends	No	6				
c	T - Bends	No	6				
c	100mm duplex coating 3CR12 cable tray.	m	100				
3.8	LOCAL EMERGENCY STOP STATIONS:						
a	Surface mounted IP65 emergency stop push buttons.	No	8				
b	Stainless Steel support stands Emergency Stop/Start Buttons	No	8				

ITEM	DESCRIPTION	UNIT	QTY	UNIT LABOUR	RATES MATERIAL	TOTAL LABOUR	TOTAL MATERIAL
3.9	Surface mounted 35A, 5 pin 3 phase welding socket including male plug, IP65. (Wall Mounted)	No	3				
	<b>LIGHTING AND SMALL POWER</b>						
3.1	<b>GALVANISED CONDUIT:</b>						
a	Surface mounted 20mm galvanised conduit including couplings, galvanised saddles and all accessories.	m	100				
c	Surface mounted round galvanised 20mm conduit boxes including galvanised cover plate.	No	30				
3.1	<b>PHOTO CELL:</b>						
a	Royce Thompson photo cell including conduit box.	No	1				
3.1	<b>WIRING PVC insulated copper conductors drawn into galvanised conduit:</b>						
a	1.5mm2	m					
b	2.5mm2	m	300				
c	4.0mm2	m	400				
d	6.0mm2	m	100				
3.1	<b>EARTH WIRING BCEW drawn into galvanised conduit:</b>						
a	1.5mm2	m					
b	2.5mm2	m	100				
c	4.0mm2	m	130				
d	6.0mm2	m	40				
3.1	<b>LUMINAIRES To be mounted to suspended ceilings and to brick walls:</b>						
a	2 x 36W IP65 vapour proof LED luminaire complete Driver.	No	6				
b	2 x 36W IP65 vapour proof LED Emergency Maintained luminaire complete Driver.	No	2				
c	2 x 18W LED compact Outdoor bulkhead luminaire complete with Driver	No	4				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
d	2 x 100W LED Floodlight with Driver Mounted on a 3.5m Stainless Steel Mast	No					
d	2 x 100W LED Floodlight with Driver Mounted on a 5.7m Stainless Steel Mast	No	2				
3.2	SOCKET OUTLETS Industrial surface mounted 16A single switched socket outlets.	No	2				
TOTAL CARRIED FORWARD TO SUMMARY							

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ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
<b>2</b>	<b>Schedule No 1 NORTH WORKS - INLET WORKS</b>						
2.1	400A, 30kA three pole circuit breaker complete to be installed in existing Minisub	No	1				
2.2	Design , Manufacture, supply, off loading, installation & Commissioning of new Dewatering MCC as shown in the specifications and drawings.	No	1				
2.3	Refurbish existing MCC by Replacing Aux. Equipment (New Power Meter, Ammeters, Voltmeters, Hour Meters) and rewire existing MCCs as shown in the specifications and drawings(Single Line Diagrams). The refurbishment works are stated in the Scope of Works Document for WAS and Aerobic Sludge P/S MCCs	No	2				
2.3	<b>LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere):</b>						
a	300mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC (MCC supply) Cable	m					
b	150mm <sup>2</sup> Kwena earthing conductor	m					
a	185mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC	m	100				
b	95mm <sup>2</sup> Kwena earthing conductor	m	100				
c	16mm <sup>2</sup> x 4 core (Local DB Cable)	m	60				
d	10mm <sup>2</sup> x 4 core	m	200				
e	4mm <sup>2</sup> x 4 core (cable)	m	120				
e	6mm <sup>2</sup> x 4 core (welding socket)	m	120				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	m	600				
3.4	LV CABLE TERMINATION: PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc						
a	300mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC	No					
b	150mm <sup>2</sup> Kwena earthing conductor	No					
	185mm <sup>2</sup> x 4/C/AL/PVC/SWA/PVC	No	2				
	95mm <sup>2</sup> Kwena earthing conductor	No	2				
c	16mm <sup>2</sup> x 4 core (Local DB Cable)	No	2				
d	10mm <sup>2</sup> x 4 core	No	4				
e	4mm <sup>2</sup> x 4 core (cable)	No					
e	6mm <sup>2</sup> x 4 core (welding socket)	No	6				
f	1.5mm <sup>2</sup> x 3 core (emergency stop cable)	No	12				
3.5	CABLE EXCAVATION:						
a	Pickable material	m <sup>3</sup>	70				
b	Soft Rock	m <sup>3</sup>	20				
c	Hard Rock	m <sup>3</sup>	20				
d	Backfilling & Compaction	m <sup>3</sup>	110				
3.6	CABLE ROUTE MARKERS: The supply and installation of concrete cable route markers	No	6				
3.7	CABLE LADDER AND TRAY: OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / walls.						
a	100mm cable ladder	m	30				
b	100mm 90° bends	No	4				
c	T - Bends	No	4				
c	100mm duplex coating 3CR12 cable tray.	m	80				
3.8	LOCAL EMERGENCY STOP STATIONS:						
a	Surface mounted IP65 emergency stop push buttons.	No	6				

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
b	Stainless Steel support stands Emergency Stop/Start Buttons	No	6				
3.9	Surface mounted 35A, 5 pin 3 phase welding socket including male plug, IP65. (Wall Mounted)	No	4				
	<b>LIGHTING AND SMALL POWER</b>						
3.1	<b>GALVANISED CONDUIT:</b>						
a	Surface mounted 20mm galvanised conduit including couplings, galvanised saddles and all accessories.	m	60				
c	Surface mounted round galvanised 20mm conduit boxes including galvanised cover plate.	No	16				
3.1	<b>PHOTO CELL:</b>						
a	Royce Thompson photo cell including conduit box.	No	2				
3.1	<b>WIRING PVC insulated copper conductors drawn into galvanised conduit:</b>						
a	1.5mm2	m					
b	2.5mm2	m	200				
c	4.0mm2	m	300				
d	6.0mm2	m	120				
3.1	<b>EARTH WIRING BCEW drawn into galvanised conduit:</b>						
a	1.5mm2	m					
b	2.5mm2	m	130				
c	4.0mm2	m	100				
d	6.0mm2	m	60				
3.1	<b>LUMINAIRES To be mounted to suspended ceilings and to brick walls:</b>						
a	2 x 36W IP65 vapour proof LED luminaire complete Driver.	No	6				
b	2 x 36W IP65 vapour proof LED Emergency Maintained luminaire complete Driver.	No	2				
c	2 x 18W LED compact Outdoor bulkhead luminaire complete with Driver	No	4				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
d	2 x 100W LED Floodlight with Driver Mounted on a 3.5m Stainless Steel Mast	No					
d	2 x 100W LED Floodlight with Driver Mounted on a 5.7m Stainless Steel Mast	No	4				
3.2	SOCKET OUTLETS Industrial surface mounted 16A single switched socket outlets.	No	4				
TOTAL CARRIED FORWARD TO SUMMARY							



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				PRICES			
ITEM	DESCRIPTION		EST	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
6	<b>Schedule No 6 IT / NETWORK:</b>						
6.1	PVC/SWA/PVC 4 core multi mode fiber optic cable. To be installed in cable trench.	m	1200				
6.2	<b>CABLE EXCAVATION:</b>						
a	Pickable material	m3	140				
b	Backfilling of cable trenches.	m3	80				
c	PVC warning tape	m	80				
d	Concrete cable route markers	No	22				
6.3	Splicing of fibre optic cores	No	12				
<b>TOTAL CARRIED FORWARD TO SUMMARY</b>							

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ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
<b>2</b>	<b>Schedule No 1 NORTH WORKS - INLET WORKS</b>						
2.1	Design , Manufacture, supply, off loading, installation & Commissioning of new West Works MCC as shown in the specifications and drawings.	No	1				
2.2	Design , Manufacture, supply, off loading, installation & Commissioning of new West Works Digester MCC as shown in the drawings and mechanical load list including instrumentation and control .MCC to incorporate all equipment for Gravity Tanks, Sludge Recirculation System, Supernatant System, Biogas Boiler Plant, Gas Holder, Digested Sludge Pump Station as provided by Mechanical Engineer Load List.	No	1				
2.3	SCADA System installation and integration into existing Sysyem	Sum	1				
2.3	Decommission existing MCCs in Plant Room, Outdoor and in Old burnt Electrical Building and deliver to Tshawane Stores	No	3				
2.4	Decommission and deliver to Tshawane Stores old Miniusb	No	1				
2.3	<b>LV CABLE PVC/SWA/PVC copper conductor cables strapped to cable ladders. (trenches, sleeves and cable terminations measured elsewhere):</b>						

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
a	300mm2 x 4/C/AL/PVC/SWA/PVC (MCC supply) Cable	m	200				
b	150mm2 Kwena earthing conductor	m	200				
a	185mm2 x 4/C/AL/PVC/SWA/PVC	m	100				
b	95mm2 Kwena earthing conductor	m	100				
c	16mm2 x 4 core (Local DB Cable)	m	30				
d	10mm2 x 4 core	m	500				
e	4mm2 x 4 core cable	m	600				
e	6mm2 x 4 core (welding socket)	m	300				
f	1.5mm2 x 3 core (emergency stop cable)	m	300				
3.4	LV CABLE TERMINATION: PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, tapes, drilling etc						
a	300mm2 x 4/C/AL/PVC/SWA/PVC	No	2				
b	150mm2 Kwena earthing conductor	No	2				
	185mm2 x 4/C/AL/PVC/SWA/PVC	No	4				
	95mm2 Kwena earthing conductor	No	4				
c	16mm2 x 4 core	No	19				
d	10mm2 x 4 core	No	10				
e	4mm2 x 4 core (cable)	No	12				
e	6mm2 x 4 core	No	6				
f	1.5mm2 x 3 core (emergency stop cable)	No	20				
3.5	CABLE EXCAVATION:						
a	Pickable material	m <sup>3</sup>	100				
b	Soft Rock	m <sup>3</sup>	20				
c	Hard Rock	m <sup>3</sup>	20				
d	Backfilling & Compaction	m <sup>3</sup>	140				
3.6	CABLE ROUTE MARKERS: The supply and installation of concrete cable route markers	No	10				

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
3.7	CABLE LADDER AND TRAY: OL55 duplex coating (exterior polyester) 3CR12 cable ladder including all accessories mounted to concrete slabs / walls.						
a	100mm cable ladder	m	100				
b	100mm 90° bends	No	10				
c	T - Bends	No	8				
c	100mm duplex coating 3CR12 cable tray.	m	600				
3.8	LOCAL EMERGENCY STOP STATIONS:						
a	Surface mounted IP65 emergency stop push buttons.	No	10				
b	Stainless Steel support stands Emergency Stop/Start Buttons	No	10				
3.9	Surface mounted 35A, 5 pin 3 phase welding socket including male plug, IP65. (Wall Mounted)	No	4				
3.1	<b>LIGHTING AND SMALL POWER</b> GALVANISED CONDUIT:						
a	Surface mounted 20mm galvanised conduit including couplings, galvanised saddles and all accessories.	m	200				
c	Surface mounted round galvanised 20mm conduit boxes including galvanised cover plate.	No	50				
3.1	PHOTO CELL:						
a	Royce Thompson photo cell including conduit box.	No	2				
3.1	WIRING PVC insulated copper conductors drawn into galvanised conduit:						
a	1.5mm2	m					
b	2.5mm2	m	300				
c	4.0mm2	m	500				
d	6.0mm2	m	90				
3.1	EARTH WIRING BCEW drawn into galvanised conduit:						
a	1.5mm2	m					
b	2.5mm2	m	100				

ITEM	DESCRIPTION	UNIT	QTY	UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
c	4.0mm2	m	170				
d	6.0mm2	m	30				
3.1	LUMINAIRES To be mounted to suspended ceilings and to brick walls:						
a	2 x 36W IP65 vapour proof LED luminaire complete Driver.	No	6				
b	2 x 36W IP65 vapour proof LED Emergency Maintained luminaire complete Driver.	No	2				
c	2 x 18W LED compact Outdoor bulkhead luminaire complete with Driver	No	4				
d	2 x 100W LED Floodlight with Driver Mounted on a 3.5m Stainless Steel Mast	No					
d	2 x 100W LED Floodlight with Driver Mounted on a 5.7m Stainless Steel Mast	No	10				
3.2	SOCKET OUTLETS Industrial surface mounted 16A single switched socket outlets.	No	4				
2.9.7	INSTRUMENTATION CABLES Dekoron or similar approved SW armoured electronic instrument cable strapped to cable ladder & laid in cable trench (type M872 individually & overall screened pairs) (cable ladder, trenching and cable terminations measured elsewhere):						
a	1mm2 x 1 pair	m	150				
b	1mm2 x 2 pair	m	150				
2.9.8	LV CABLE TERMINATION PVC/SWA/PVC Exe corrosion guard cable glands (IP68) complete including conductor & earth termination, lugs, heatshrink, drilling, etc:						
a	1mm2 x 1 pair	No	12				
b	1mm2 x 2 pair	No	12				

ITEM	DESCRIPTION			UNIT	RATES	TOTAL	TOTAL
		UNIT	QTY	LABOUR	MATERIAL	LABOUR	MATERIAL
2.9.9	ULTRASONIC LEVEL DETECTOR:						
a	FDU92 level sensor including 20m of cable.	No	1				
b	304 stainless steel support bracket for the sensor head.	No	1				
c	FMU90 ultrasonic level transmitter.	No	1				
d	Programming of the ultrasonic level transmitter.	No	1				
e	FEB for the transmitter including terminals, surge arrestors, circuit breaker & stainless steel pedestal.	No	1				
2.9.11	ULTRASONIC OPEN CHANNEL FLOW METER:						
a	FDU92 flow sensor including 20m of cable.	No	1				
b	304 stainless steel support brackets for the sensor head.	No	1				
c	FMU90 ultrasonic flow transmitter.	No	1				
d	Programming of the ultrasonic flow transmitter.	No	1				
e	FEB for the transmitter including terminals, surge arrestors, circuit breaker & stainless steel pedestal.	No	1				
TOTAL CARRIED FORWARD TO SUMMARY							



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Item	Description	Unit	Qty	Rate	Total
	BILL NO 1:WEST				
	Gravity/Equaliser Tank to Digesters				
1	<b>Supply and Install piping,fitting,corrosion protection,valves and gaskets to connected to the HDPE Underground Pumped line from the North Sludge Pumpstation into the gravity Equalizing primary sludge tank.All mild steel piping shall be internally epoxy coated and externally sandblasted and polyurethane coated as per standard COT Specification</b>				
1.01	DN300 Sch 40 Mild Steel Piping from just above the ground to the gravity tank complete with corrosion protection	m	R	15.00	
1.02	DN300 Mild Steel 90Deg Bend	ea	R	6.00	
1.03	DN300 RSV Wedge Manual Handwheel valve	ea	R	2.00	
1.04	DN300 Flanged pipe stub into the gravity tank with puddle flanges	ea	R	1.00	
1.05	DN250 Mild Steel bottom outlet from the gravity tank complete with sleeve and puddle flanges	m	R	2.00	
1.06	DN250 RSV Manual Gate Valve	ea	R	2.00	
1.07	DN250 90Deg Bend	ea	R	6.00	
1.08	DN250 Sch 40 Mild Steel piping complete with corrosion protect	m	R	100.00	
1.09	DN 250 Tees	ea	R	2.00	
1.1	DN200 RSV Manual Gate Valves	ea	R	2.00	
1.11	DN200 Sch40 Mild Steel piping complete with corrosion Protection	m	R	150.00	
1.12	DN200 Bends	ea	R	28.00	
1.13	DN200 Tees to the Digesters	ea	R	7.00	
1.14	DN200 RSV Manual Gate Valves	ea	R	7.00	
1.15	DN200 Stainless Steel piping GR304 Into the digester	m	R	90.00	
1.16	DN200 Stainless Steel GR304 Radial Inlet Diffuser Assembly	ea	R	7.00	
1.17	DN200 Stainless Steel Stub Inlet and Puddle flange on the digester wall	ea	R	7.00	
1.18	DN200 Scour Drain piping for the gravity Tank	ea	R	12.00	
1.19	DN200 Scour RSV Manual Gate valve for the gravity Tank	ea	R	1.00	
1.2	DN200 Sch 40 Mild Steel piping for the overflow	m	R	15.00	
1.21	DN200 RSV Manual gate valve for overlfow	ea	R	1.00	
1.22	DN200 Overflow Stub into the gravity Tank	ea	R	1.00	
2	Sludge Recirculation System				
2.01	Refurbish and corrosion treat DN200 Sludge Withdrawal piping	sum	R	7.00	
2.02	DN200 S/S Plug Valves for the withdrawal lines before the header	ea	R	7.00	
2.03	DN300 Mild Steel Sch40 Header to the recirclation Pumps	m	R	120.00	



2.04	Supply and Install new Vaughan HE8N100SN Horizontal Sludge Chopper Recirculation Pumps at 120lps,40m head complete with baseplate,control panel ,variable speed drive ,timers and provision for integration into SCADA	ea	R	7.00		
2.05	Refurbish existing Vaughan HE8N100SN Horizontal Sludge Chopper Recirculation Pumps at 120lps,40m head complete with baseplate,control panel ,variable speed drive ,timers and provision for integration into SCADA	ea	R	7.00		
2.06	DN 300 90deg Bends	ea	R	28.00		
2.07	DN 300 RSV Manual Handwheel Gate Valves	ea	R	14.00		
2.08	DN350 Sch 40 Piping from the Pumps to the Biogas Plant	m	R	150.00		
2.09	DN 350 90Deg Bends	ea	R	20.00		
2.1	DN350 RSV Manual Isolating Valves	ea	R	42.00		
2.11	DN350 Bypass Piping from the Pumps to Digester	m	R	105.00		
2.12	DN350 Manual Isolation Gate Valves	ea	R	42.00		
2.13	DN350 Tees	ea	R	14.00		
2.14	DN350 Stainless Steel Diffuser Ring assembly including dropper from outside	ea	R	7.00		
2.15	Provision for 3-Way Automated Plug Valve	ea	R	7.00		
2.16	Provision for the 3-Way Valve Actuator	ea	R	7.00		
2.17	temperature Transmitter(PT100,4-20ma)	ea	R	7.00		
2.18	Identification Plate Recirculation Plant and Pumps	ea	R	1.00		
3	Supernatant Withdrawal Line					
3.01	Refurbish existing DN150 Supernatant draw off pipes	ea	R	28.00		
3.02	DN150 Supenatent Piping including Corrosion Treatment	m	R	70.00		
3.03	DN150 Isolation Manual Gate Valves	ea	R	7.00		
4	Biogas Boiler Plant,gas holder and Piping					
4.01	Decommission and Remove existing Biogas Piping	ea	R	1.00		
4.02	Supply and Instal DN80 S/S Gr 304 Piping	m	R	120.00		
4.03	DN80 S/S Gr304 Tees	ea	R	12.00		
4.04	DN80 S/S Gr304 Bends	ea	R	10.00		
4.05	DN80 flame Arrestor Assemly complete with presssure ,relief and non return valve	ea	R	1.00		
4.06	DN100 S/S GR304 piping From main line and biogas collector to the flame arrestr	m	R	20.00		
4.07	DN100 flare assembly including automatic ignition,pilot,burner and stack	ea	R	1.00		
4.08	Gas holder safety control panel complete with safety alarms ,autovent and interlocks	ea	R	1.00		
4.09	Decommission and Remove existing biogas collection	lot	R	1.00		
4.1	Supply and install 600m3 new biogas collector complete system	ea	R	1.00		
4.11	Supply and Install stainless steel sludge to water heat exchanger with 200kW Heat Transfer,sludge flow rate of 30m3/h,hot water flow rate of 30m3/h,inlet water temperatue of 12degrees,sludge outlet temperatue of 35-43degrees.	ea	R	2.00		
4.12	Supply and Install biogas fire boiler with duty of 400 kw complete with commissioning as per OHS Act and PER Regulatons	ea	R	1.00		
4.13	DN200 flue stack including supports and roof penetration	ea	R	1.00		
4.14	Boiler water softening plant complete with resin plant with a capacity of 4m3/h	ea	R	1.00		

4.15	Chemical Dosing plant including dosing pumps and panel					
4.16	1000L Deaerator /atmospheric makeup air tank s/s gr304 complete with float and level switch	ea	R	1.00		
4.17	Close Coupled Horizontal centrifugal hot water circulation pumps with one duty and standby at 30m3/h duty and 30m Head.Pumps must be installed with the accompanying control panel	ea	R	1.00		
4.18	Sludge-Water H-Ex circulation pumps at duty 30m3/h and 30m Head Duty with one duty and another standby.Pumps must be installed with accompanying control panel	ea	R	1.00		
4.19	4 Cylinder LPG Manifold bank and vaporizer including piping to the boiler	ea	R	1.00		
4.2	Plantroom Extractor fan at 1200l/s	ea	R	1.00		
4.21	Plantroom fire CO2 Fire Extinguisher	ea	R	1.00		
4.22	Plantroom signage	ea	R	1.00		
4.23	Plantroom DCP Fire Extinguisher	ea	R	1.00		
5	Digester General Repairs					
5.01	Supply and Install 1200x900x12mm Stainless Steel Gr 304/316 Checker Plate inspect hole lid complete with lifting handles,pre-drilled mounting holes,high tensile bolts	ea	R	7.00		
5.02	Remove existing 1200 x 900mm cast iron neck at the inspection hole and replace with a stainless steel 12mm x GR304/316 Stainless steel including welded flanged lip to fit new lid with pre-drilled holes.This should include removal and recasting concrete with the neck	ea	R	7.00		
5.03	Replace the 800dia x 12mm cast iron lid for the mixer inlet hole complete with pre-drilled holes ,bolts and gasket	ea	R	7.00		
5.04	Replace all AC Piping from the methane gas outlet to the valve chamber with welded stainless steel GR304/316 :125mm x sch80S	ea	R	15.00		
5.05	Remove ,recast and replace existing methane gas outlet cast iron neck and replace with stainless steel GR304/316 neck complete with lip flanges with pre-drilled holes and gasket to mount new lid:1100mm x 12mm	ea	R	7.00		
5.06	Supply and Install new stainless steel dome lid for methane gas outlet dome complete with pre-drilled holes,bolts,washers and a flanged outlet to mount methane gas piping	ea	R	7.00		
5.07	Derust and repaint all hand railings at the Digester plant including those liding to the ground level	sum	R	7.00		
5.08	Refurbish existing 225mm cast iron scum removal/overflow piping to required level	ea	R	7.00		
5.09	Supply and Install 225mm mechanical flange adapter to create a flange connection to the cast iron piping	ea	R	7.00		
5.1	supply 225mm loose removable flange with gasket,bolts ,nuts and washers (to be used during crust removal)_	ea	R	7.00		
5.11	Supply and instal steel handrails to fully enclose the digester tank valve chamber (5m x 7m)	ea	R	7.00		
5.12	Refurbish 100mm methane gas isolating valve in the valve chamber	ea	R	7.00		
5.13	Replace all 125mm AC Methane gas piping with welded stainless steel Sch80S Gr 304/316 piping including properly coupling the piping to underground AC Piping to the boiler plant	m	R	7.00		
5.14	Supply and Install new thermocouple with Analogue gauge for local readout	ea	R	7.00		
5.15	Supply and Install hand railing around the valve and pump chamber(10m x 5m)	ea	R	7.00		

5.16	Refurbish the exposed part of DN350 sludge draw off piping per digester	m	R	140.00		
5.17	Replace all DN350 Sludge draw off Isolating Manual Hand Valves	ea	R	14.00		
5.18	Supply and Install Manual Chainblock Davits with 1500kg SWL for the digesters .	ea	R	2.00		
6	Digested Sludge Pump Station					
6.01	Replace Gorman Rupp Ultra V6A60 Pump complete with pump control panel,variable speed drive and provision of SCADA incorporation	ea	R	1.00		
6.02	Refurbish Gorman Rupp Ultra V6A60 Pump	ea	R	1.00		
6.03	Refurbish all manual suction and discharge valves (DN800mm).	ea	R	4.00		
6.04	Supply and install HCP or equivalently approved submersible (1,5kW x 2-Pole Motor x Vortex Impleller with Duty 3l/s @ 14m Head) drainage pump including float switch and piping to discharge (Allow for Ø50mm pipe x 6m of mild steel piping) back into the digested slugde sump.	ea	R	1.00		
6.05	Derust, corrosion treatment, and painting of the 2T beam inside the plantroom.	ea	R	1.00		
6.06	Load Test and certify 2T Single Beam lifting equipment.	ea	R	1.00		
6.07	Supply and install of plain stainless steel identification plates at the Digested Sludge Pump Station.(130mm x35mm x1mm Thick must include punching of ID Codes with Stainless Steel wire crimp)	sum	R	1.00		
6.08	Refurbishment of Ø300mm inlet valves in situ at Digested sludge Pumpstation	ea	R	2.00		
6.09	Supply and install plantroom extraction ventilation 1500l/s @ 200Pa	ea	R	1.00		
	Total Excluding Contingencies					

**CITY OF TSHWANE**  
**CONTRACT NO : RFP047/2025**  
**CONSTRUCTION OF PHASE 1 ROOIWAL WWTW NORTH AND WEST WORKS**  
**MECHANICAL**

	<b>The following BoQ relates to the mechanical works in the North works</b>				
2	Mechanical Screens				
2.01	Major Service of Inlet Sluice Gates	ea	R	3.00	
2.02	Major service and restoration of mechanical inlet screens, including disassembly, cleaning, replacement of damaged components (chains, sprockets, bearings, screen panels, wipers, seals), reassembly, alignment, lubrication, and functional testing to restore full operational functionality	ea	R	3.00	
2.03	<b>Major Service of outlet sluice gates</b>	ea	R	3.00	
2.04	Refurbishment and painting of hand railings, including corrosion removal, repairs, priming, and application of protective coating system as per standard mechanical specification	sum	R	1.00	
2.05	Supply, installation, and commissioning of complete mechanical conveyor belt system 800m wide with a duty of 230m <sup>3</sup> /h for screened debris transfer, including drive unit, belt, rollers, frame, support structure, tensioning system, guards, and all mechanical fittings from coarse screens to belt presses as per drawings and specification	ea	R	2.00	
2.06	Opening of the wall into incinerator room to permit for installation of a new conveyor belt system	ea	R	1.00	
2.07	Supply, installation and commissioning of a screenings washer compactor with a duty:15m <sup>3</sup> /h throughput,50% volume reduction and made of stainless steel GR316L including belt press unit, feed system, dewatering pumps, dewatering piping, drive components, control panel, wash water system, and all mechanical and electrical components as per specification	ea	R	2.00	
2.08	Corrosion treatment and repainting of existing expanded metal floor grating, including surface preparation, anti-corrosive priming, and application of protective coating to restore appearance and prevent further deterioration as per mechanical standard specification	sum	R	1.00	
2.09	Supply, installation, and commissioning of screw conveyor for transfer of dewatered screenings from belt press to screenings bins, complete with drive unit, trough, screw shaft, bearings, covers, discharge chute, and structural supports as per specification	ea	R	2.00	
2.1	Supply of new screening bins ,screening bins to match existing bins on site.Refer to provided drawings	ea	R	2.00	
2.11	Strip to Quote Reciprocating Scrapers	ea	R	2.00	

2.12	Provision for Refurbishment and reinstatement of reciprocating scraper system to full operational functionality, including detailed inspection of all components, removal and replacement of failed gearbox and motor, repair and reinforcement of recurrently failing pivotal bush with upgraded bushing and shaft alignment, servicing of scraper arms, linkages, guide rails, and return mechanisms, replacement of worn fasteners, pins, and couplings, full mechanical alignment and torque checks, lubrication of all moving parts with installation of grease points if required, and complete dry-run testing and commissioning under operational conditions. Refurbishment works must include corrosion protection of all parts	ea	R	2.00		
2.13	Supply of a new grit bin for reciprocating scrapers. Refer to provide drawings and specification	ea	R	1.00		
2.14	Supply and installation submersible degritter pumps, duty 16 l/s at 8 m TDH, for free-standing installation in vortex sump. Pumps to be preferably Flygt or HCP or any other equivalent approved by the mechanical engineer. Pumps must be supplied with emergency isolation point, and weatherproof control panel with motor protection as per specification	ea	R	6.00		
2.15	Supply and installation of DN80 flexible discharge hoses to connect to the submersible pumps	ea	R	6.00		
2.16	Supply, fabrication, and installation of DN250 piping for the degritter system, manufactured from sch40 mild steel, complete with internal and external corrosion protection coatings suitable for abrasive and corrosive wastewater service	m	R	50.00		
	Specifications for the Piping					
	The internal surface of the pipe shall be coated with SIGMA 582AR, a high-build, abrasion-resistant, solvent-free epoxy lining, applied to a minimum dry film thickness (DFT) of 300 microns. The external surface shall be coated with a two-component protection system consisting of SIGMA COVER 456 epoxy primer and SIGMAFAST 278 polyurethane topcoat, with a minimum total DFT of 250 microns. Refer to that specification provided					
2.17	DN200 Isolating gate valves between classifiers on the header line	ea	R	5.00		
2.18	DN80 Non return valves	ea	R	6.00		
2.19	D80 butterfly Isolating valves	ea	R	6.00		
2.122	Supply and installation of a grit classifier preferably HUBER or another approved by the mechanical engineer, complete with screw conveyor, drive motor and gearbox, classifier trough, support frame, inlet and overflow connections, and grit discharge chute. Classifier must be duty-rated for continuous operation, corrosion and abrasion resistant.	ea	R	4.00		

2.23	Refurbishment of existings grit classifiers	ea	R	2.00		
2.124	Supply and installation of new grit bins	ea	R	6.00		
2.125	Reconditioning of existing DN400 mild steel piping to the reciprocating grit scraper, including complete surface preparation and reapplication of internal and external corrosion protection coatings, replacement of all gaskets, and replacement or refabrication of damaged flanges. Scope includes mechanical cleaning (SA 2.5), application of high-build epoxy coating (min. 300 microns DFT), supply and installation of new gaskets, flange kits, bolts, and any required pipe supports.	m	R	30.00		
2.126	Supply and installation of new 200kg SWL manual pump hoist at the vortex chambers	ea	R	6.00		
2.127	Supply and installation of expanded metal grating for pump access at the vortex chambers	ea	R	6.00		
2.2	Primary Sedimentation Tanks					
2.201	Supply and installation of new sluice gates at the dividing box for the new Primary Sedimentation Tanks (PSTs), each gate to be approximately 800 mm wide (final dimensions to be confirmed on site)  Specifications for the sluice gates  Each sluice gate shall be of the slide (penstock) type with rising spindle, wall-mounted or channel-mounted configuration to suit the structure. Gate and frame shall be fabricated from 316L stainless steel, with EPDM or NBR resilient seals for bi-directional sealing, and designed for a minimum head of 5 m water column. The spindle shall be stainless steel, heavy-duty, with low-friction guide rails and polymer slide inserts, and shall be long enough to accommodate full depth of the PST (long spindle type, approx. 6 m).  The actuator shall be a manual handwheel, mounted on a pedestal or wall bracket as applicable, with integral thrust bearing for smooth operation. All fixings and anchors shall be stainless steel (Grade 316). The gates must comply with BS 7775 or EN 12266 Class 5 leakage standards and be passivated for corrosion resistance in submerged wastewater environments	ea	R	4.00		
2.202	Supply, delivery, installation, testing, and commissioning of a complete scraper bridge system for Primary Sedimentation Tanks (PSTs), designed for continuous-duty wastewater treatment operations. The system shall include a full-span bridge structure, peripheral drive mechanism, sludge scraping assembly, scum skimmer and tipping trough system, electrical controls, and all associated mechanical and civil interfaces. Equipment shall be preferably of Techroveer manufacture or equivalently approved by the Engineer  Specifications	ea	R	2.00		

The scraper bridge shall be a full-span, self-supporting structure designed to span the Primary Sedimentation Tank. It shall be fabricated from either hot-dip galvanized mild steel with a minimum 85 µm zinc coating as specified. The bridge shall include a non-slip walkway of open grating or durbar plate flooring with self-draining capability, allowing safe access for maintenance personnel. Full-length safety handrails with a minimum height of 1.1 m, toe boards not less than 100 mm high, and all required ladders, platforms, and access points shall be provided. The bridge shall be structurally designed to accommodate live loads and maintenance equipment in compliance with SANS 10162 standard

The scraper bridge shall be driven by either a central or peripheral drive unit, depending on the tank configuration. The drive motor shall be TEFC type, IP66-rated, three-phase, 400V, with Class F insulation and S1 continuous-duty rating. The gearbox shall be of helical or bevel gear type, heavy-duty, and rated to withstand at least twice the operational torque requirement. Overload protection shall be included via either a torque limiter, shear pin coupling, or electronic torque monitoring. The complete drive assembly shall be mounted on a corrosion-resistant support with vibration isolation pads. The scraper bridge shall rotate at a controlled speed of approximately 0.02 to 0.06 rpm, completing a full rotation every 30 to 60 minutes.

The scraper mechanism shall consist of radial scraper arms extending from the drive centre to the tank perimeter, equipped with bottom-mounted scraper blades to collect settled sludge and direct it towards the central hopper. Scraper arms shall be constructed from stainless steel. Blades shall be made of UHMWPE or polyurethane. The system shall include hopper-sealing plates for sludge capture. The scraper arms shall be guided by rollers constructed from nylon with sealed bearings running on a circular tank track

A dedicated scum skimming system shall be integrated with the scraper bridge and shall consist of a radial skimming arm, either manually adjustable or float-actuated. The system shall discharge into a stainless steel tipping trough or tray, designed for counterweight-based tipping operation. The tipping trough shall be constructed of 304 or 316 stainless steel, with an adjustable flow discharge system and heavy-duty hinge mechanism. All guides, stops, and counterweight linkages shall be included. The complete system shall be designed to remove floating debris and discharge it into the scum removal channel

A local weatherproof control panel rated to IP65 shall be supplied and installed for operation of the scraper bridge system. The panel shall be fabricated from powder-coated mild steel and equipped with a variable speed drive (VSD) as required. It shall include motor overload protection, emergency stop button, auto/manual selector switch, and operational hour meter. The panel shall be capable of integration with plant SCADA via potential-free contacts and interface with level switches if needed. All cabling shall be UV- and moisture-resistant, with proper cable routing, glands, trays, and earthing systems conforming to SANS 10142 and IEC 60204

	<p>The contractor shall include full QA/QC and project execution provisions. A Factory Acceptance Test (FAT) shall be conducted at the manufacturer's premises prior to delivery, including mechanical fit-up, torque testing, and component verification. A Site Acceptance Test (SAT) shall follow installation, including dry-run and wet-run commissioning, verification of rotation speed, torque performance, scum removal, and scraper functionality. Quality documentation including material certificates (e.g., EN 10204 3.1 for stainless steel), coating DFT reports, torque test logs, and motor certificates shall be submitted. Full method statements and risk assessments shall be provided. All craneage, rigging, lifting equipment, and safe access systems for installation are included. Operator training shall be provided after commissioning, along with all as-built drawings, O&amp;M manuals, and warranty documents</p>					
2.203	<p>Supply and installation of complete stainless steel overflow weir assembly for the Primary Sedimentation Tanks (PSTs), consisting of an inner straight backplate and a V-notch weir plate, mounted on the internal face of the launder wall, including all mounting hardware, seals, supports, and installation works</p> <p>Specification for the weir plates</p> <p>The Inner straight backplate, shall be installed directly against the inside vertical face of the launder wall, fabricated from Grade 316L stainless steel, minimum 3 mm thick, continuous along the entire launder length or circumference.</p> <p>A V-notch weir plate, shall be fabricated from Grade 316L stainless steel, minimum 3 mm thick, mounted in front of the backplate, facing into the tank. The weir plate shall be factory-cut with uniform 90° V-notches, spaced at minimum 150 mm centres. All edges shall be rounded and de-burred</p>	ea	R	2.00		
2.202	<p>Provision for Supply and installation of a DN200 manual isolation knife gate valve, PN16 flanged, with epoxy-coated ductile iron or stainless steel body, stainless steel blade, and EPDM resilient seat for the scum removal line into the sludge sump. Valve to include a 5 m rising stainless steel spindle extension, pedestal-mounted manual handwheel actuator, and mechanical position indicator. All components to be suitable for buried wastewater service, complete with gaskets, bolts, and Grade 316 stainless steel fasteners. The valve will be installed in a concrete valve chamber. Valve chamber by others</p>	ea	R	2.00		
2.203	NB200 scum removal piping	By Civils	R	1.00		
2.3	The Sludge Pump Station					
2.301	<p>Supply, fabrication and installation of DN350 sludge draw-off piping at the sludge sump. This includes the coupling to the underground piping and all associated fittings to connect to isolation and piston valve. All underground piping by civils</p> <p>Specification</p>	ea	R	2.00		



	The piping shall be constructed from Stainless steel SCH80S and installed below the sludge level of the PST to allow gravity flow. Should the mechanical engineer approved mild steel piping, it shall be schedule 40 with: The internal surface shall be coated with an epoxy lining SIGMA 582AR, minimum dry film thickness of 300 microns. The external surface shall be protected with a bitumen-based or epoxy/polyurethane coating system, with a minimum dry film thickness of 250 microns. Refer to standard mechanical specification provided					
2.304	Supply and installation of a DN350 manual isolation knife gate valve on the PST sludge draw-off pipeline inside the sludge sump complete with long spindle extension for surface operation	ea	R	2.00		
2.305	Supply and installation of a vertically mounted piston-type sludge discharge valve at the terminal end of the upward-facing DN350 sludge draw-off pipe, complete with bracketed support and top-mounted electric actuator and rising or non rising spindle extension. Actuator preferably AUMA SA Series or Rotork IQ3 Series	ea	R	2.00		
2.306	Supply and installation of a DN100 mild steel pipe air backflush line onto the DN350 sludge draw-off pipeline inside the sludge sump to the Primary Sedimentation Tank (PST), with provision for compressor connection	ea	R	2.00		
2.307	Provision for Supply and Install DN350 Valve and Actuator Knife Edge gate valves with provision for manual bypass operation for the primary sludge PS06 to the sludge sump	sum	R	2.00		
2.308	Provision for Supply and Install DN350 Valve and Actuator Knife Edge gate valves for the primary sludge PS05 to the sludge sump with provision for manual bypass operation	sum	R	2.00		
2.309	Supply and Install electromagnetic flow meters, PP01 to PP03 complete with electrical power supplies and conduits.	ea	R	2.00		
2.31	Supply and Install electromagnetic flow meter from PP02 to PP03 complete with electrical power supplies and conduits.	ea	R	2.00		
2.312	Supply and install a DN350 Pipe from PS05 and PS06 to Sludge sump PP03.	m	R	40.00		
2.313	Supply and install a DN350 piping from PP01 and PP02 to Sludge sump PP03.	m	R	80.00		
2.4	Primary Sludge Pump-station-Feed to West Works Tower					
2.41	Supply and install Gorman Rupp Sludge Pumps Model T10A-B-4 operating at 70l/s @ 60m TDH	ea	R	2.00		
2.42	Supply and Install 22kW Pump Control Panel Complete with Variable Speed Drive including electrical cables and controls to the pumps. Control panel must come with provision for future connections to the SCADA.	ea	R	1.00		

2.43	Supply and Install DN300mm Manual Handwheel Isolating Resilient Seated Wedge Gate Valves.	ea	R	5.00		
2.44	Supply and Install NB300mm Mild Steel Pipe (Minimum 6mm thick) that is Corrosion protected with epoxy polyurethane Piping as per drawing in the plantroom including reducers, tees, bends and end caps complete with supports. Piping must include connection to the concrete line running from the plantroom to the West Sludge anaerobic digester line.	m	R	30.00		
2.45	Supply and Installation of 50mm Air valves.	ea	R	2.00		
2.46	Supply and install a drainage submersible pump(1,5kW Motor x Vortex Impeller operating at 3l/s@ 12m Head) preferably HCP or any other equivalently approved complete with float switch and piping(NB50mm) to drain back into the sludge sump.	sum	R	1.00		
2.47	Supply and Install DN300 Non Return Valve.	ea	R	2.00		
2.5	Primary Sludge Pump-station-Feed to East Works P/S					
2.51	Supply and install Gorman Rupp Sludge Pumps Model T10A-B-4 operationg at 70l/s@ 30m TDH.	ea	R	2.00		
2.52	Supply and Install 22kW Pump Control Panel Complete with Variable Speed Drive including electrical cables and controls to the pumps. Control panel must come with provision for future connections to the SCADA.	ea	R	1.00		
2.53	Supply and Install DN300mm Manual Isolating Resilient Seated Gate Valves.	ea	R	5.00		
2.54	Supply and Install DN300 Non Return Valve.	ea	R	2.00		
2.55	Supply and Install NB300mm Mild Steel Pipe Sch40 that is Corrosion protected with epoxy polyurethane Piping as per drawing in the plantroom including reducers, tees, bends and end caps complete with supports. Piping must include connection to the concrete line running from the plantroom to the East Sludge anaerobic digester line.	m	R	30.00		
2.56	Supply and Installation of 50mm Air valves.	ea	R	2.00		
2.6	Plantroom Ventilation					
2.61	Supply and install Freudenberg or equivalent similar modular Fresh Air Unit to supply 1500l/s@ 450Pa to maintain plantroom positive pressure. Modular Unit must come with primary panel filtration only, its own panel with alarm indicators for dirty filters and fan trip. The Unit to be mounted outside the plantroom as per the drawing and specification.	ea	R	1.00		
2.62	850 x 250 Uninsulated Ducting and air terminals to Drop down to plantroom lower level including supports.	m	R	10.00		
2.63	Electrical Supplies to the Modular Filtered Fresh Air Unit.	m	R	10.00		

2.7	Lifting Equipment				
2.71	<p>Supply and installation, and commissioning of an electrically operated, overhead rail-mounted double girder gantry crane for use in the sludge pump station, with a Safe Working Load (SWL) of 2000 kg. The crane shall be designed to suit the depth and headroom constraints of the pump station (approx. 8 m below ground level), and provide lifting capability for sludge pumps and mechanical components</p> <p>Specification for the gantry crane</p> <p>The lifting system shall comprise a heavy-duty electric wire rope hoist with a minimum lifting height of 9 m to allow for full vertical travel from the pump station floor to access level. The hoist shall be mounted on a motorised traversing trolley installed on the bottom flange of the crane girders. The lifting speed shall be approximately 1–3 m/min, with soft start/stop functionality, while the trolley travel speed shall be 10–20 m/min. The hoist and trolley shall include overload protection, upper and lower limit switches, and be controlled via a low-voltage pendant control station with full directional control and emergency stop. The system shall operate on a 400V, 3-phase, 50Hz power supply.</p> <p>Installation shall include the supply and fixing of crane rails, all mounting brackets, electrical cable routing, full hoist and trolley alignment, and load testing. The crane shall be certified through on-site static and dynamic load testing using a 2.5-ton test load, and all SWL markings, movement indicators, and operation placards shall be provided. The system shall be compliant with SANS 10375, SANS 10160/10162, ISO 4301, and OHSA Driven Machinery Regulations. A minimum design life of 20 years shall be achieved under normal wastewater treatment duty conditions</p>	ea	R	1.00	
2.8	Primary Settling Tanks				
2.801	Replace 0,55kW x 4 Pole Motors for Settling Tank Bridges	ea	R	4.00	
2.802	Strip to Quote PST Scraper Bridge	ea	R	4.00	
2.803	Provision for Repairs as per report submitted	ea	R	4.00	
2.804	Decommissioning and removal of existing desludging pumps.	ea	R	3.00	

2.805	Supply and install PST Desludging Pumps-Gorman Rupp T63AS self priming pumps	ea	R	3.00		
2.806	Supply and Install resilient seal isolating gate valves and other fittings to accompany the desludging valves.	ea	R	4.00		
2.9	Biological Reactors					
2.901	Refurbish Vaughan Model HE8N100SR existing axial flow internal return pumps at BR1,1	ea	R	3.00		
2.902	Relocate 7,5kw Mixers from the anoxic to the aerobic	ea	R	2.00		
2.903	Supply and Install new Stainless Steel Davits for the Anoxic	ea	R	2.00		
2.904	Supply and Install new 10kw Mixers	ea	R	4.00		
2.906	Comprehensive Refurbishmentof the outlet sluice gates.	ea	R	18.00		
2.907	Refurbishment of the twist lock gate for scum removal weir	ea	R	18.00		
2.908	Replacement of the airflow meters for Anaerobic Zone.	ea	R	4.00		
2.909	Replacement of the Airflow meters for aeration zone 1-4	ea	R	4.00		
2.91	Replacement of air compression equipment preferably Atlas copco XAS-185-150 mobile air compressor:duty 174cfm@150 psi	ea	R	3.00		
2.1	Secondary Sedimentation Treatment					
2.10.1	Refurbish manual 400 dia scour hand valves to the dissolved air flotation plant.	ea	R	18.00		
3	Balancing Tanks					
3.101	Replace the West Balancing Pump-Model VS18Z225 Complete baseframe and flow level control	ea	R	6.00		
3.102	Replace DN200 Manual Isolating Valves	ea	R	22.00		
3.103	Refurbish DN200 Non Return Valves	ea	R	6.00		
3.104	Refurbish and corrosion treatment of the DN200 plantroom piping and fittings	m	R	50.00		
	Subtotals Excluding Contingencies					