DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			CARRIED FORWARD R		[illegible]
4.1.9	Spares and tools	Item	1	-	-
	All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify): -				
4.1.9.1	1) [illegible]	Item	1	[illegible]	[illegible]
4.1.9.2	2) [illegible]	Item	1	[illegible]	[illegible]
4.1.9.3	3) [illegible]	Item	1	[illegible]	[illegible]
4.1.9.4	4) [illegible]	Item	1	[illegible]	[illegible]
	5) % off [illegible]	Item	1	[illegible]	[illegible]
4.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
4.2.1	All HVAC and associated equipment as described in the items under 4.1.1 to 4.1.9.4	Item	1	[illegible]	[illegible]
4.2.2	Carrying out and documenting the results of performance tests on the installed equipment	Item	1	[illegible]	[illegible]
4.2.3	Incidental repairs to concrete work and civil alterations to fit the equipment supplied; this includes modifications to mechanical components such as doors	Item	1	[illegible]	[illegible]
4.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify): -				
4.2.4.1	1) [illegible]	Item	1	[illegible]	[illegible]
4.2.4.2	2)	Item	1	-	-
4.2.4.3	3)	Item	1	-	-
4.2.4.4	4)	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 4 CARRIED TO SUMMARY ON PAGE 328				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 5				
5.	ATHLONE BLOWER-HOUSE GANTRY CRANE				
5.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others: -				
5.1.1	New appropriately spanned and sized Constra (or approved equivalent) 20Ton Double Girder Electric Overhead Travelling Crane c/w Road transport to site; hooks; rail to roof truss; floor to rail and supports	Item	1	[illegible]	[illegible]
5.1.2	To include a down shop power supply system for crane c/w weld-on brackets; safe bar insulated conductor rail; limit switches; controls and current collectors	Item	1	28 000,00	28 000,00
5.1.3	Include the installation, erection and commissioning	Item	1	[illegible]	[illegible]
5.1.4	To include load testing and certification	Item	1	[illegible]	[illegible]
5.1.5	To include a full-length platform walkway on bridge of crane	Item	1	[illegible]	[illegible]
5.1.6	Provisional sum for work as directed by the Engineer	PC Sum		-	R150 000
5.1.7	Spares and tools All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify) -	Item	1	-	-
5.1.7.1	1) [illegible]	Item	1	[illegible]	[illegible]
5.1.7.2	2).....	Item	1	-	-
5.1.7.3	3).....	Item	1	-	-
5.1.7.4	4).....	Item	1	-	-
				BROUGHT FORWARD R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
	CARRIED FORWARD R				[illegible]
5.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
5.2.1	All Gantry crane and associated equipment as described in the items under 5.1.1 to 5.1.7.4	Item	1	[illegible]	[illegible]
5.2.2	Carrying out and documenting the results of performance tests on the installed equipment	Item	1	[illegible]	[illegible]
5.2.3	Incidental repairs to concrete work and civil alterations to fit the gantry crane equipment supplied	Item	1	[illegible]	[illegible]
5.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
5.2.4.1	1).....	Item	1	-	-
5.2.4.2	2).....	Item	1	-	-
5.2.4.3	3).....	Item	1	-	-
5.2.4.4	4).....	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 5 CARRIED TO SUMMARY ON PAGE 926				[illegible]

[redacted]

[redacted]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
	SCHEDULE NO. 6				
6.	RETURN ACTIVATED SLUDGE PUMPS, PIPING AND VALVES				
6.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others: -				
6.1.1	Remove existing East RAS pumps	No	3	37 950,00	113 850,00
6.1.2	Remove existing West RAS pumps	No	3	37 950,00	113 850,00
6.1.3	Modify East and West RAS sumps suction configuration to ensure that there are no leaks (i.e Blind off the sump outlets with a Stainless Steel Grade 316 plate).	Item	1	124 638,25	124 638,25
6.1.4	East RAS centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 2521 m³/h @ 5m head	No	3	647 369,50	1 942 108,50
6.1.5a	Upgrade East RAS pipework:700 mm NB GRP piping	m	30	4 197,40	125 922,00
6.1.5b	700mm GRP 90° elbows as required for 6.1.5a	No	6	24 503,05	147 018,30
6.1.5c	900mm x 700mm GRP T-pieces as required for 6.1.5a	No	3	52 478,35	157 435,05
6.1.6a	Upgrade East RAS pipework:900 mm NB GRP piping	m	220	6 220,07	1 368 415,40
6.1.6b	900mm GRP 90° elbows as required for 6.1.6a	No	5	41 676,80	208 484,00
6.1.7	Sludge suction and discharge isolation, manual knife gate valve, 700 mm NB PN6, with Ductile Iron body with FBE coating, 304 stainless steel spindle and 304L stainless steel blade	No	6	172 748,80	1 036 492,80
6.1.8	Swing check valve, 700 mm NB, with Ductile Iron body with FBE coating.	No	3	304 498,19	913 494,57
~~6.1.9~~	~~Drain manual ball valve,25mm NB, full bore, stainless steel body, PTFE seat, lockable stainless steel handle~~	~~No~~	6	-	-
~~6.1.10~~	~~Pressure gauge manual ball valve15mm NB, full bore, stainless steel body, PTFE seat, stainless steel handle~~	~~No~~	~~15~~	-	-
6.1.11	All associated piping supports, flanges, platforms, cat ladders, grating, walkway chains and cascade clamps	Item	1	257 500,00	257 500,00
6.1.12	West RAS centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 1704 m³/h @ 4m head	No	3	615 024,80	1 845 074,40
6.1.13a	Upgrade West RAS pipework: 600 mm NB GRP piping	m	42	3 334,11	140 111,62
6.1.13b	600mm GRP 90° elbows as required for 6.1.13a	No	6	18 416,40	110 529,60
				CARRIED FORWARD R	9 105 251,24

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
			BROUGHT FORWARD R		[illegible]
6.1.14	Sludge discharge isolation, manual knife gate valve, 600 mm NB PN6, with Ductile iron body with FBE coating, Stainless Steel Grade 304 spindle and Stainless Steel Grade 304L blade	No	3	[illegible]	[illegible]
6.1.15	Swing check valve,600 mm NB, with Ductile iron body with FBE coating.	No	3	[illegible]	[illegible]
~~6.1.16~~	~~Drain manual ball valve,25mm NB, full bore, Stainless Steel body, PTFE seat, lockable stainless steel handle~~	~~No~~	~~3~~	-	-
6.1.17	All associated piping supports, flanges, platforms, cat ladders, grating, walkway chains and cascade clamps	Item	1	[illegible]	[illegible]
6.1.18	Provisional sum for work as directed by the Engineer	PC Sum		-	R150 000
6.1.19	**Spares and tools**	Item	1	-	-
	All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
6.1.19.1	1).....	Item	1	-	-
6.1.19.2	2).....	Item	1	-	-
6.1.19.3	3).....	Item	1	-	-
6.1.19.4	4).....	Item	1	-	-
6.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
6.2.1	All pumps and associated equipment as described in the items under 6.1.1 to 6.1.19.4	Item	1	[illegible]	[illegible]
6.2.2	Carrying out and documenting the results of performance tests on the installed equipment	Item	1	[illegible]	[illegible]
6.2.3	Incidental repairs to concrete work and civil alterations to fit the equipment supplied	Item	1	[illegible]	[illegible]
			CARRIED FORWARD R		[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	BROUGHT FORWARD			R	[illegible]
6.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-	Item	1	-	-
6.2.4.1	1). New Pressure Indicators with Chem Seals	Item	1	42 176 ,25	42 176, 25
6.2.4.2	2).....	Item	1	-	-
6.2.4.3	3).....	Item	1	-	-
6.2.4.4	4).....	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 6 CARRIED TO SUMMARY ON PAGE 328				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
7.	SCHEDULE NO. 7 WASTE ACTIVATED SLUDGE PUMPS, PIPING AND VALVES				
7.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others: -				
7.1.1	Remove old WAS pumps	Item	4	4 025,00	16 100,00
7.1.2	Modify sump suction configuration to ensure that there are no leaks	Item	1	-	Incl
7.1.3	WAS pumps: Centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 120 m³/h @ 20m head	Item	3	175 722,40	527 167,20
7.1.4a	Upgrade WAS pipework: 150 mm NB 316 stainless steel piping	m	30	3 157,64	94 729,20
7.1.4b	150mm NB 316 Stainless Steel 90° elbows as required	No	6	4 329,22	25 975,32
7.1.4c	150mm x 150mm NB 316 Stainless steel T-pieces as required	No	2	5 944,20	11 888,40 11 888,40
7.1.5	Valves: Sludge suction and discharge isolation, manual knife gate valve, 150 mm NB PN6, with Ductile iron body with FBE coating, 304 Stainless Steel spindle and 304L stainless steel blade	No	6	11 274,05	67 644,30
7.1.6	Swing check valve, 150 mm NB, with Ductile iron body with FBE coating. Actol S.A.	No	3	17 202,05	51 606,15
~~7.1.7~~	~~Drain manual ball valve,25mm NB, full bore, stainless steel body, PTFE seat, lockable stainless steel handle~~	~~No~~	~~0~~		
~~7.1.8~~	~~Pressure gauge manual ball valve15mm NB, full bore, stainless steel body, PTFE seat, stainless steel handle~~	~~No~~	~~12~~		
7.1.9	All associated piping supports, flanges, platforms, cat ladders, grating, walkway chains and cascade clamps	Item	1	51 600,00	51 600,00
7.1.10a	Design, supply and install as interconnecting mixed liquor stainless steel piping (600mm NB) between the valve chamber and mixed liquor sump	m	50	14 114,74	705 737,00
7.1.10b	600mm NB 316 Stainless steel 90° elbows as required	No	6	53 461,20	320 767,20
7.1.11	Remove recycle water pumps	Item	3	5 366,67	16 100,01
7.1.12	Allowance for expanding the existing WAS sump	Item	1	100 813,00	100 813,00
7.1.13	Provisional sum for work as directed by the Engineer	PC Sum		-	R150 000
7.1.14	Spares and tools All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
7.1.14.1	1).....	Item	1	-	-
7.1.14.2	2).....	Item	1	-	-
				CARRIED FORWARD R	2 [illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R	PRICE C	AMOUNT R	AMOUNT c
	SCHEDULE NO. 7						
7.	**WASTE ACTIVATED SLUDGE PUMPS, PIPING AND VALVES**						
7.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others: -						
7.1.1	Remove old WAS pumps	Item	4				
7.1.2	Modify sump suction configuration to ensure that there are no leaks	Item	1				
7.1.3	WAS pumps: Centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 120 m³/h @ 20m head	Item	3				
7.1.4	Upgrade WAS pipework: 150 mm NB 316 stainless steel piping	m	30				
7.1.5	Valves: Sludge suction and discharge isolation, manual knife gate valve, 150 mm NB, with Ductile Iron body with FBE coating, 304 Stainless Steel spindle and 304L stainless steel blade	No	6				
7.1.6	Swing check valve,150 mm NB, with Ductile Iron body with FBE coating.	No	3				
~~7.1.7~~	~~Drain manual ball valve,25mm NB, full bore, stainless steel body, PTFE seat, lockable stainless steel handle~~	~~No~~	6				
~~7.1.8~~	~~Pressure gauge manual ball valve15mm NB, full bore, stainless steel body, PTFE seat, stainless steel handle~~	~~No~~	~~12~~				
7.1.9	All associated piping supports, flanges, platforms, cat ladders, grating, walkway chains and cascade clamps	Item	1				
7.1.10	Design, supply and install an interconnecting mixed liquor stainless steel piping (300mm NB) between the valve chamber and mixed liquor sump	m	50				
7.1.11	Remove recycle water pumps	Item	3				
7.1.12	Allowance for expanding the existing WAS sump	Item					
7.1.13	Provisional sum for work as directed by the Engineer	PC Sum				R150 000	
7.1.14	**Spares and tools**						
	All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-						
7.1.14.1	1).....	Item	1				
7.1.14.2	2).....	Item	1				
				CARRIED FORWARD	**R**		

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
			BROUGHT FORWARD R		[illegible]
7.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
7.2.1	All pumps and associated equipment as described in the items under 7.1.1 to 7.1.4.2	Item	1	[illegible]	[illegible]
7.2.2	Carrying out and documenting the results of performance tests on the installed equipment	Item	1	[illegible]	[illegible]
7.2.3	Incidental repairs to concrete work and civil alterations to fit the equipment supplied	Item	1	[illegible]	[illegible]
7.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify) -				
7.2.4.1	1) [illegible]	Item	1	[illegible]	[illegible]
7.2.4.2	2).....	Item	1	-	-
7.2.4.3	3).....	Item	1	-	-
7.2.4.4	4).....	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 7 CARRIED TO SUMMARY ON PAGE 126				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 8				
8.	**A-RECYCLE PUMPS, PIPING AND VALVES**				
8.1	**Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others:-**				
8.1.1	Remove existing A-Recycle pumps, valves and pipework	Item	4	[illegible]	[illegible]
8.1.2	Modify sump suction configuration to ensure that there are no leaks (i.e Blind sump outlets with a 316 stainless steel Grade plate)	Item	1	[illegible]	[illegible]
8.1.3	Design, build, supply and install pump Stainless Steel Grade 316 chambers on the reactors incl. weir plate (See drawing W17S2-55004)	Item	6	[illegible]	[illegible]
8.1.4	A-recycle pumps shall be high efficiency and axial flow type. Pump capacity 3391 m³/h @ 1 m head	Item	12	[illegible]	[illegible]
8.1.5	Design, supply, installation and testing of lifting mechanism for each set of A-Recycle pumps which allow for ease of maintenance of equipment.	No	6	[illegible]	[illegible]
8.1.6	Design and construction of a 316 stainless steel trough (1000mm x 1000mm) (WxH) complete with a venturi flume to transfer mixed liquor from the aeration zone to the anoxic zone; including associated supports.	m	320	[illegible]	[illegible]
8.1.7	Design, supply, installation and testing of 900 NB 316 stainless steel pipe connecting the trough to the second anoxic zone; including associated supports.	m	220	[illegible]	[illegible]
8.1.8	Provisional sum for work as directed by the Engineer	PC Sum		-	R150 000
8.1.9	Spares and tools	Item	1	-	-
	All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
8.1.9.1	1).....	Item	1	-	-
8.1.9.2	2).....	Item	1	-	-
				CARRIED FORWARD R	[illegible]

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ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
			BROUGHT FORWARD	R	[illegible]
8.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
8.2.1	All pumps and associated equipment as described in the items under 8.1.1 to 8.1.9.2	Item	1	[illegible]	[illegible]
8.2.2	Carrying out and documenting the results of performance tests on the installed equipment	Item	1	[illegible]	[illegible]
8.2.3	Incidental repairs to concrete work and civil alterations to fit the equipment supplied	Item	1	[illegible]	[illegible]
8.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
8.2.4.1	1).....	Item	1	-	-
8.2.4.2	2).....	Item	1	-	-
8.2.4.3	3).....	Item	1	-	-
8.2.4.4	4).....	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 8 CARRIED TO SUMMARY ON PAGE 324				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R c
	SCHEDULE NO. 9				
9.	SUBMERSIBLE MIXERS				
9.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others: -				
9.1.1	Remove existing submersible mixers and make good	Item	36	[illegible]	[illegible]
9.1.2	Design, Supply, install and commission new 7.5kW submersible mixers	Item	36	[illegible]	[illegible]
9.1.3	Design, Supply, install and commission associated equipment i.e. 316 stainless steel guide columns, davit arms, lifting winches, handrails, floor gratings, and platforms.	Item	36	[illegible]	[illegible]
9.1.4	Provisional sum for work as directed by the Engineer	PC Sum		-	R150 000
9.1.5	Spares and tools	Item	1	-	-
	All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
9.1.5.1	1).....	Item	1	-	-
9.1.5.2	2).....	Item	1	-	-
9.1.5.3	3).....	Item	1	-	-
9.1.5.4	4).....	Item	1	-	-
				CARRIED FORWARD R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD	R	6 302 925,00
9.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
9.2.1	All submersible mixers and associated equipment as described in the items under 9.1.1 to 9.1.5.4	Item	1	144 900,00	144 900,00
9.2.2	Carrying out and documenting the results of performance tests on the installed equipment	Item	1	34 500,00	34 500,00
9.2.3	Incidental repairs to concrete work and civil alterations to fit the equipment supplied	Item	1	28 750,00	28 750,00
9.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify): -				
9.2.4.1	1).....	Item	1	-	-
9.2.4.2	2).....	Item	1	-	-
9.2.4.3	3).....	Item	1	-	-
9.2.4.4	4).....	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 9 CARRIED TO SUMMARY ON PAGE 326				6 511 075,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
	SCHEDULE 10				
10.	ODOUR CONTROL				
10.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others:				
10.1.1	Removal of the recirculation pumps serving the Biotrickling filters of the Inlet works and PST's	No	2	1 932,00	3 864,00
10.1.2	Removal of the fans serving the biotrickling filters of the Inlet works and PST's	No	2	1 932,00	3 864,00
10.1.3	Removal of the nutrient tanks agitators serving the Inlet works and PST's	No	2	1 932,00	3 864,00
10.1.4	Removal of spent filtermedia from the Biotrickling filters serving the Inlet work and PST's	Item	1	21 444,00	21 444,00
10.1.5a	Inlet works recirculation pumps: Centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 8.2 m³/h @ 34.5m head	No	1	65 269,00	65 269,00
10.1.5b	PSTs recirculation pumps: Centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 2.12m³/h @ 39.8m head	No	1	52 567,20	52 567,20
10.1.6	Extraction fan serving the Inlet works: Centrifugal fans with base plate and electrical motor and safety guard. Fan capacity 4000m³/h @ 2000 Pa	No	1	104 377,00	104 377,00
10.1.7	Extraction fans serving the PST's: Centrifugal fan with base plate and electrical motor and safety guard. Fan capacity 750 m³/h @ 2000Pa	No	1	18 776,65	18 776,65
10.1.8	Design, supply, install and commission of the nutrient tank agitators (0.37kW) serving the Biotrickling filters of the Inlet works and PST's	No	2	22 223,90	44 447,80
10.1.9	Replenish the Biotrickling filters serving the Inlet works with media filter	m³	15	44 855,75	672 836,25
10.1.10	Replenish the Biotrickling filters serving PST's with media filter	m³	6	44 855,75	269 134,50
10.1.11	Provisional sum for work as directed by the Engineer	PC Sum			R150 000
10.1.12	Spares and tools All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify)-	Item	1	10 144,00	10 144,00
10.1.12.1	1) Pipes & Fittings	Item	1	3 129,50	3 129,50
10.1.12.2	2) Pipe & Fittings & adapters (Fans)	Item	1	10 445,00	10 445,00
				CARRIED FORWARD R	1 570 394,70

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R	PRICE c	AMOUNT R	AMOUNT c
	SCHEDULE 10						
10.	**ODOUR CONTROL**						
10.1	**Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others:** -						
10.1.1	Removal of the recirculation pumps serving the Biotrickling filters of the Inlet works and PST's	No	2				
10.1.2	Removal of the fans serving the biotrickling filters of the Inlet works and PST's	No	2				
10.1.3	Removal of the nutrient tanks agitators serving the Inlet works and PST's	No	2				
10.1.4	Removal of spent filter media from the Biotrickling filters serving the Inlet work and PST's	Item	1				
10.1.5	Recirculation pumps: Centrifugal pumps with base plate and electrical motor and safety guard. Pump capacity 191 LPM@ 31m head	No	2				
10.1.6	Extraction fans serving the Inlet works: Centrifugal fans with base plate and electrical motor and safety guard. Fan capacity 0.37 Am³/h @ 2200 Pa	No	1				
10.1.7	Extraction fans serving the PST's: Centrifugal fans with base plate and electrical motor and safety guard. Fan capacity 0.43 Am³/h @ 4300Pa	No	1				
10.1.8	Design, supply, install and commission of the nutrient tank agitators serving the Biotrickling filters of the Inlet works and PST's	No	2				
10.1.9	Replenish the Biotrickling filters serving the Inlet works with media filter	m³	15				
10.1.10	Replenish the Biotrickling filters serving PST's with media filter	m³	6				
10.1.11	Provisional sum for work as directed by the Engineer	PC Sum				R150 000	
10.1.12	**Spares and tools**	Item	1				
	All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-						
10.1.12.1	1).....	Item	1				
10.1.12.2	2).....	Item	1				
				CARRIED FORWARD	R		

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R C	AMOUNT R C
			BROUGHT FORWARD R		[illegible]
10.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -				
10.2.1	Recirculation centrifugal pumps, extraction fans and agitators, complete with motors, base plates and safety guards. Costs shall include allowance for removal of existing equipment.	Item	1	[illegible]	[illegible]
10.2.2	Costs shall include allowance for removal of existing filters.	Item	1	[illegible]	[illegible]
10.2.3	Mechanical materials and fittings to accommodate installation of centrifugal pumps, extraction fans, agitators and filters as per Volume 3A of this tender.	Item	1	[illegible]	[illegible]
10.2.4	Mechanical materials and fittings to accommodate installation of various items of instrumentation as per the Instrument Lists in Volume 3A of this tender	Item	1	[illegible]	[illegible]
10.2.5	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
10.2.5.1	1).....	Item	1	-	-
10.2.5.2	2).....	Item	1	-	-
10.2.5.3	3).....	Item	1	-	-
10.2.5.4	4).....	Item	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 10 CARRIED TO SUMMARY ON PAGE 326				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE 11				
11.	ATHLONE AERATION PIPING NETWORK MODIFICATIONS				
11.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others:-				
11.1.1	200mm NB PN6 V-port Knife Gate control valves, complete with actuators as per specification outlined in Vol. 3A	No	12	[illegible]	[illegible]
11.1.2	300mm NB PN6 V-port Knife Gate control valves, complete with actuators as per specification outlined in Vol. 3A	No	6	[illegible]	[illegible]
11.1.3	900mm NB PN6 Manual Knife gate valves as per specification outlined in Vol 3A	No	3	[illegible]	[illegible]
11.1.4	200mm NB PN6 Manual Knife gate valves as per specification outlined in Vol 3A	No	12	[illegible]	[illegible]
11.1.5	300mm NB PN6 Manual Knife gate valves as per specification outlined in Vol 3A	No	6	[illegible]	[illegible]
11.1.6	Mechanical materials and fittings to accommodate installation of valves	Item	1	–	incl
11.1.7	Mechanical materials and fittings to accommodate installation of various items of instrumentation as per the instrument list (W1 792-61001)	Item	1	[illegible]	[illegible]
11.1.8	Provisional sum for work as directed by the Engineer	PC Sum			R150 000
11.1.9	Spares and tools All other plant and equipment items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-	Item	1	-	-
11.1.9.1	1).....	Item	1	–	-
				CARRIED FORWARD R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R	PRICE C	AMOUNT R	AMOUNT C
				BROUGHT FORWARD	R		
11.2	Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -						
11.2.1	V-port knife gate control valves, complete with actuators; Manual knife gate and butterfly valves. Cost shall include allowance for removal of existing valves and redundant orifice plates.	Item	39	[redacted]		[redacted]	
11.2.2	Mechanical materials and fittings to accommodate installation of control valves as per the Control Valve Lists in Volume 3A of this tender.	Item	1	-		incl	
11.2.3	Mechanical materials and fittings to accommodate installation of various items of instrumentation as per the Instrument Lists in Volume 3A of this tender	Item	1	-		incl	
11.2.4	All other site installation and general items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-						
11.2.4.1	1).....	Item	1	-		-	
11.2.4.2	2).....	Item	1	-		-	
	TOTAL AMOUNT OF SCHEDULE NO. 11 CARRIED TO SUMMARY ON PAGE 328					[redacted]	

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE	AMOUNT R c
	SCHEDULE NO. 12				
12.	**NEW FINE BUBBLE DIFFUSED AERATION (FBDA) EQUIPMENT, PIPING AND FITTINGS; MATERIALS AND EQUIPMENT**				
12.1	***Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others:-as set out hereunder and further detailed in Section A, Volume 3A:***				
12.1.1 12.1.1.1	**REACTOR A** Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No	[redacted]	[redacted]	[redacted]
12.1.1.2	Lateral piping assemblies	Sum	1	[redacted]	[redacted]
12.1.1.3	Header piping assemblies	Sum	1	[redacted]	[redacted]
12.1.1.4	Sub header assemblies	Sum	1	[redacted]	[redacted]
12.1.1.5	Drop legs	Sum	1	[redacted]	[redacted]
12.1.1.6	Fixings, including anchors to concrete floor and pipe supports	Sum	1	[redacted]	[redacted]
12.1.1.7	Condensate purging system	Sum	1	[redacted]	[redacted]
12.1.1.8	Spares: Diffuser units	No	[redacted]	[redacted]	[redacted]
12.1.1.9	Spares: Diffuser gaskets	No	[redacted]	[redacted]	[redacted]
12.1.2 12.1.2.1	**REACTOR B** Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No	[redacted]	[redacted]	[redacted]
12.1.2.2	Lateral piping assemblies	Sum	[redacted]	[redacted]	[redacted]
12.1.2.3	Header piping assemblies	Sum	1	[redacted]	[redacted]
12.1.2.4	Sub header assemblies	Sum	1	[redacted]	[redacted]
12.1.2.5	Drop legs	Sum	1	[redacted]	[redacted]
12.1.2.6	Fixings, including anchors to concrete floor and pipe supports	Sum	1	[redacted]	[redacted]
12.1.2.7	Condensate purging system	Sum	1	[redacted]	[redacted]
12.1.2.8	Spares: Diffuser units	No	[redacted]	[redacted]	[redacted]
12.1.2.9	Spares: Diffuser gaskets	No	[redacted]	[redacted]	[redacted]
				CARRIED FORWARD R	[redacted]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD	R	
12.1.3	REACTOR C				
12.1.3.1	Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No			
12.1.3.2	Lateral piping assemblies	Sum	1		
12.1.3.3	Header piping assemblies	Sum	1		
12.1.3.4	Sub header assemblies	Sum	1		
12.1.3.5	Drop legs	Sum	1		
12.1.3.6	Fixings, including anchors to concrete floor and pipe supports	Sum	1		
12.1.3.7	Condensate purging system	Sum	1		
12.1.3.8	Spares: Diffuser units	No			
12.1.3.9	Spares: Diffuser gaskets	No			
12.1.4	REACTOR D				
12.1.4.1	Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No			
12.1.4.2	Lateral piping assemblies	Sum	1		
12.1.4.3	Header piping assemblies	Sum	1		
12.1.4.4	Sub header assemblies	Sum	1		
12.1.4.5	Drop legs	Sum	1		
12.1.4.6	Fixings, including anchors to concrete floor and pipe supports	Sum	1		
12.1.4.7	Condensate purging system	Sum	1		
12.1.4.8	Spares: Diffuser units	No			
12.1.4.9	Spares: Diffuser gaskets	No			
			CARRIED FORWARD	R	

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD R		
12.1.5	REACTOR E				
12.1.5.1	Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No	1627		
12.1.5.2	Lateral piping assemblies	Sum	1		
12.1.5.3	Header piping assemblies	Sum	1		
12.1.5.4	Sub header assemblies	Sum	1		
12.1.5.5	Drop legs	Sum	1		
12.1.5.6	Fixings, including anchors to concrete floor and pipe supports	Sum	1		
12.1.5.7	Condensate purging system	Sum	1		
12.1.5.8	Spares: Diffuser units	No	10		
12.1.5.9	Spares: Diffuser gaskets	No	20		
12.1.6	REACTOR F				
12.1.6.1	Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No	1627		
12.1.6.2	Lateral piping assemblies	Sum	1		
12.1.6.3	Header piping assemblies	Sum	1		
12.1.6.4	Sub header assemblies	Sum	1		
12.1.6.5	Drop legs	Sum	1		
12.1.6.6	Fixings, including anchors to concrete floor and pipe supports	Sum	1		
12.1.6.7	Condensate purging system	Sum	1		
12.1.6.8	Spares: Diffuser units	No	10		
12.1.6.9	Spares: Diffuser gaskets	No	20		
12.7	Retrievable Diffuser Set				
12.7.1	Diffuser units, including membranes, baseplates, retainer rings, gaskets, O-rings and saddles	No	1		
12.7.2	Piping assembly, supports and isolation	Sum	1		
12.7.3	Retrieval mechanism: Chain block, crawl beam and support, signage indicating maximum load on chain block and beam, guide rails	Sum	1		
			CARRIED FORWARD R		

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD R		
12.8	Clean In Place system				
12.8.1	Metered CIP dosing pump with local control panel	No			
12.8.2	CIP diaphragm charging pump with local control panel	No			
12.8.3	Dosing tank with auxiliary pipework, fittings, level indication, mobile containment bund, flexible piping and quick couplings	Sum			
12.8.4	Mobile generator to power CIP pumping skid	No			
	Reactor A distribution piping				
12.8.5	Polypropylene piping	m			
12.8.6	Additional fittings and quick couplings	Sum			
	Reactor B distribution piping				
12.8.7	Polypropylene piping	m			
12.8.8	Additional fittings and quick couplings	Sum			
	Reactor C distribution piping				
12.8.9	Polypropylene piping	m			
12.8.10	Additional fittings and quick couplings	Sum			
	Reactor D distribution piping				
12.8.11	Polypropylene piping	m			
12.8.12	Additional fittings and quick couplings	Sum	1		
	Reactor E distribution piping				
12.8.13	Polypropylene piping	m			
12.8.14	Additional fittings and quick couplings	Sum	1		
	Reactor F distribution piping				
12.8.15	Polypropylene piping	m			
12.8.16	Additional fittings and quick couplings	Sum	1		
12.9	**All other plant and equipment items not included above but which are necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-**				
12.9.1	a)	Sum	1	-	-
12.9.2	b)	Sum	1	-	-
12.9.3	c)	Sum	1	-	-
12.9.4	d)	Sum	1	-	-
			CARRIED FORWARD R		

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD	R	6 739 307,00
12.10	All additional spares (not listed above) and tools necessary to meet the Scope of Work and/or required for the proper, safe and effective operation of the plant (Specify):-				
12.10.1	a)	Sum	1	-	-
12.10.2	b)	Sum	1	-	-
12.10.3	c)	Sum	1	-	-
12.10.4	d)	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 12 CARRIED TO SUMMARY ON PAGE 326				6 739 307,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 13				
13.	NEW FINE BUBBLE DIFFUSED AERATION (FBDA) EQUIPMENT, PIPING AND FITTINGS: PREPARATION FOR INSTALLATION				
13.1	Allow for all costs and expenses in connection with the design, manufacture, quality management, painting, testing, supply, delivery, offloading and storage of the following materials and equipment, including quality assurance, setting out of works and checking work carried out by others: -				
13.1.1	REACTOR A				
13.1.1.1	Draining of reactor to location determined by Employer. Including provision of suitable pumps and hoses	Sum	1	58 443,00	58 443,00
13.1.1.2	Following draining of the reactor, clean out sludge from all reactor basins	m²	1005	201,25	202 256,25
13.1.1.3	Removal of existing diffusers, laterals, headers, drop legs, condensate pipework, fasteners and fittings	Sum	1	115 000,00	115 000,00
13.1.1.4	Provision of emergency portable submersible underflow drainage pumps, powered by mobile generator, to prevent floating and damage of reactor floor in the event of power failures	Sum	1	57 500,00	57 500,00
13.1.1.5	Allow for all costs and expenses to conduct a detailed dimensional survey of the existing civil infrastructure prior to finalizing the design of diffuser system	Sum	1	14 375,00	14 375,00
13.1.1.6	Resealing concrete floor of reactor as per specification:				
	(a.) Cleaning and preparation of surface	m²	100	575,00	57 500,00
	(b.) Apply 1mm rebar protection to damaged surface	m²	100	-	incl -
	(c.) Apply 0,5mm thick bonding agent to damaged surface	m²	100	-	incl -
	(d.) Apply repair mortar with an average thickness of 50mm and float to a smooth finish	m²	100	-	incl -
	(e.) Apply 2-3mm of pore sealer	m²	100	431,25	43 125,00
	(f.) Apply 2 coats of chemicaly resistant epoxy paint	m²	100	402,50	40 250,00
13.1.2	REACTOR B				
13.1.2.1	Draining of reactor to location determined by Employer. Including provision of suitable pumps and hoses	Sum	1	58 443,00	58 443,00
13.1.2.2	Following draining of the reactor, clean out sludge from all reactor basins	m²	1005	201,25	202 256,25
13.1.2.3	Removal of existing diffusers, laterals, headers, drop legs, condensate pipework, fasteners and fittings	Sum	1	115 000,00	115 000,00
			CARRIED FORWARD	R	[redacted]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD	R	464 [illegible]
13.1.2.4	Provision of emergency portable submersible underflow drainage pumps, powered by mobile generator, to prevent floating and damage of reactor floor in the event of power failures	Sum	1	[illegible]	[illegible]
13.1.2.5	Allow for all costs and expenses to conduct a detailed dimensional survey of the existing civil infrastructure prior to finalizing the design of diffuser system	Sum	1	4 375,00	4 375,00
13.1.2.6	Repairing concrete floor of reactor as per specification:				
	(a.) Cleaning and preparation of surface	m²	100	575,00	57 500,00
	(b.) Apply 1mm rebar protection to damaged surface	m²	100	-	incl -
	(c.) Apply 0,5mm thick bonding agent to damaged surface	m²	100	-	incl -
	(d.) Apply repair mortar with an average thickness of 50mm and float to a smooth finish	m²	100	-	incl -
	(e.) Apply 2-3mm of pore sealer	m²	100	431,25	43 125,00
	(f.) Apply 2 coats of chemically resistant epoxy paint	m²	100	402,50	40 250,00
13.1.3	REACTOR C				
13.1.3.1	Draining of reactor to location determined by Employer. Including provision of suitable pumps and hoses	Sum	1	56 443,00	56 443,00
13.1.3.2	Following draining of the reactor, clean out sludge from all reactor basins	m³	1005	201,25	202 256,25
13.1.3.3	Removal of existing diffusers, laterals, headers, drop legs, condensate pipework, fasteners and fittings	Sum	1	15 000,00	15 000,00
13.1.3.4	Provision of emergency portable submersible underflow drainage pumps, powered by mobile generator, to prevent floating and damage of reactor floor in the event of power failures	Sum	1	57 500,00	57 500,00
13.1.3.5	Allow for all costs and expenses to conduct a detailed dimensional survey of the existing civil infrastructure prior to finalizing the design of diffuser system	Sum	1	4 375,00	4 375,00
13.1.3.6	Repairing concrete floor of reactor as per specification:				
	(a.) Cleaning and preparation of surface	m²	100	575,00	57 500,00
	(b.) Apply 1mm rebar protection to damaged surface	m²	100	-	incl -
			CARRIED FORWARD	R	1 [illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD	R	1 681 917,75
	(c.) Apply 0,5mm thick bonding agent to damaged surface	m²	100	-	incl -
	(d.) Apply repair mortar with an average thickness of 50mm and float to a smooth finish	m²	100	-	incl -
	(e.) Apply 2-3mm of pore sealer	m²	100	431,25	43 125,00
	(f.) Apply 2 coats of chemically resistant epoxy paint	m²	100	402,50	40 250,00
13.1.4	REACTOR D				
13.1.4.1	Draining of reactor to location determined by Employer, including provision of suitable pumps and hoses	Sum	1	55 443,00	55 443,00
13.1.4.2	Following draining of the reactor, clean out sludge from all reactor basins (Grit - Added)	m³	1005	201,25	202 256,25
13.1.4.3	Removal of existing diffusers, laterals, headers, drop legs, condensate pipework, fasteners and fittings	Sum	1	115 000,00	115 000,00
13.1.4.4	Provision of emergency portable submersible underflow drainage pumps, powered by mobile generator, to prevent floating and damage of reactor floor in the event of power failures	Sum	1	57 500,00	57 500,00
13.1.4.5	Allow for all costs and expenses to conduct a detailed dimensional survey of the existing civil infrastructure prior to finalizing the design of diffusor system	Sum	1	14 375,00	14 375,00
13.1.4.6	Repairing concrete floor of reactor as per specification:				
	(a.) Cleaning and preparation of surface	m²	100	575,00	57 500,00
	(b.) Apply 1mm rebar protection to damaged surface	m²	100	-	incl -
	(c.) Apply 0,5mm thick bonding agent to damaged surface	m²	100	-	incl -
	(d.) Apply repair mortar with an average thickness of 50mm and float to a smooth finish	m²	100	-	incl -
	(e.) Apply 2-3mm of pore sealer	m²	100	431,25	43 125,00
	(f.) Apply 2 coats of chemically resistant epoxy paint	m²	100	402,50	40 250,00
13.1.5	REACTOR E				
13.1.5.1	Draining of reactor to location determined by Employer, including provision of suitable pumps and hoses	Sum	1	55 443,00	55 443,00
13.1.5.2	Following draining of the reactor, clean out sludge from all reactor basins (Grit - Added)	m³	1005	201,25	202 256,25
			CARRIED FORWARD	R	2 514 479,75

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD R		2644 [illegible]
13.1.5.3	Removal of existing diffusers, laterals, headers, drop legs, condensate pipework, fasteners and fittings	Sum	1	[illegible]	[illegible]
13.1.5.4	Provision of emergency portable submersible underflow drainage pumps, powered by mobile generator, to prevent floating and damage of reactor floor in the event of power failures	Sum	1	[illegible]	[illegible]
13.1.5.5	Allow for all costs and expenses to conduct a detailed dimensional survey of the existing civil infrastructure prior to finalizing the design of diffuser system	Sum	1	[illegible]	[illegible]
13.1.5.6	Repairing concrete floor of reactor as per specification:				
	(a.) Cleaning and preparation of surface	m²	100	[illegible]	[illegible]
	(b.) Apply 1mm rebar protection to damaged surface	m²	100	-	Incl -
	(c.) Apply 0,5mm thick bonding agent to damaged surface	m²	100	-	Incl -
	(d.) Apply repair mortar with an average thickness of 50mm and float to a smooth finish	m²	100	-	Incl -
	(e.) Apply 2-3mm of pore sealer	m²	100	[illegible]	[illegible]
	(f.) Apply 2 coats of chemically resistant epoxy paint	m²	100	[illegible]	[illegible]
13.1.6	REACTOR F				
13.1.6.1	Draining of reactor to location determined by Employer, including provision of suitable pumps and hoses	Sum	1	[illegible]	[illegible]
13.1.6.2	Following draining of the reactor, clean out sludge from all reactor basins	m³	1005	[illegible]	[illegible]
13.1.6.3	Removal of existing diffusers laterals, headers, drop legs, condensate pipework, fasteners and fittings	Sum	1	[illegible]	[illegible]
13.1.6.4	Provision of emergency portable submersible underflow drainage pumps, powered by mobile generator, to prevent floating and damage of reactor floor in the event of power failures	Sum	1	[illegible]	[illegible]
13.1.6.5	Allow for all costs and expenses to conduct a detailed dimensional survey of the existing civil infrastructure prior to finalizing the design of diffuser system	Sum	1	[illegible]	[illegible]
13.1.6.6	Repairing concrete floor of reactor as per specification:				
	(a.) Cleaning and preparation of surface	m²	100	[illegible]	[illegible]
	(b.) Apply 1mm rebar protection to damaged surface	m²	100	-	Incl -
	(c.) Apply 0,5mm thick bonding agent to damaged surface	m²	100	-	Incl -
	(d.) Apply repair mortar with an average thickness of 50mm and float to a smooth finish	m²	100	[illegible]	[illegible]
	(e.) Apply 2-3mm of pore sealer	m²	100	[illegible]	[illegible]
	(f.) Apply 2 coats of chemically resistant epoxy paint	m²	100	[illegible]	[illegible]
			CARRIED FORWARD R		[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	BROUGHT FORWARD R				[illegible]
13.1.7.1	Provisional sum for work as directed by the Engineer	PC Sum			R150 000
13.1.8	All other plant and equipment items not included above but which are necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
13.1.8.1	1).....	Sum	1	-	-
13.1.8.2	2).....	Sum	1	-	-
13.1.8.3	3).....	Sum	1	-	-
13.1.8.4	4).....	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 13 CARRIED TO SUMMARY ON PAGE 326				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE	AMOUNT R c
	SCHEDULE NO. 14				
14.	**NEW FINE BUBBLE DIFFUSED AERATION (FBDA) EQUIPMENT, PIPING AND FITTINGS; INSTALLATION, TESTING, COMMISSIONING, UPHOLDING**				
14.1	**Allow for all costs and expenses, including double handling (if stored) and final painting (if applicable), in connection with the Site installation, testing, relocation, commissioning and upholding during the Trial Operation Period and Defects Notification Period of the following: -**				
14.1.1	Reactor A Fine Bubble Diffused Aeration Network, including diffuser units, lateral piping, header/sub header piping, drop legs, condensate removal piping, all fittings and fasteners	Sum	1	[illegible]	[illegible]
14.1.2	Reactor B Fine Bubble Diffused Aeration Network, including diffuser units, lateral piping, header/sub header piping, drop legs, condensate removal piping, all fittings and fasteners	Sum	1	[illegible]	[illegible]
14.1.3	Reactor C Fine Bubble Diffused Aeration Network, including diffuser units, lateral piping, header/sub header piping, drop legs, condensate removal piping, all fittings and fasteners	Sum	1	[illegible]	[illegible]
14.1.4	Reactor D Fine Bubble Diffused Aeration Network, including diffuser units, lateral piping, header/sub header piping, drop legs, condensate removal piping, all fittings and fasteners	Sum	1	[illegible]	[illegible]
14.1.5	Reactor E Fine Bubble Diffused Aeration Network, including diffuser units, lateral piping, header/sub header piping, drop legs, condensate removal piping, all fittings and fasteners	Sum	1	[illegible]	[illegible]
14.1.6	Reactor F Fine Bubble Diffused Aeration Network, including diffuser units, lateral piping, header/sub header piping, drop legs, condensate removal piping, all fittings and fasteners	Sum	1	[illegible]	[illegible]
14.1.7	Lifting equipment used for retrievable diffuser network including load testing	Sum	1	[illegible]	[illegible]
14.1.8	Clean in Place pumping skid and tank	Sum	1	[illegible]	[illegible]
14.1.9	Reactor A CIP distribution piping	Sum	1	[illegible]	[illegible]
14.1.10	Reactor B CIP distribution piping	Sum	1	[illegible]	[illegible]
14.1.11	Reactor C CIP distribution piping	Sum	1	[illegible]	[illegible]
14.1.12	Reactor D CIP distribution piping	Sum	1	[illegible]	[illegible]
				CARRIED FORWARD R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	BROUGHT FORWARD R				
14.1.13	Reactor E CIP distribution piping	Sum	1	[redacted]	[redacted]
14.1.14	Reactor F CIP distribution piping	Sum	1	[redacted]	[redacted]
14.1.15	Mobile generator to power CIP pumping skid	Sum	1	-	Incl in
14.1.16	Factory testing of FBDA systems witnessed by the Engineer and Employer	Sum	1	[redacted]	[redacted]
14.1.17	Allowance for 2 (two) representatives (Client and Process/ Project Engineer) subsistence and travel disbursements related to 14.1.18	Sum	1	[redacted]	[redacted]
14.1.18	All other plant and equipment items not included above but which are necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify):-				
14.1.18.1	1).....	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 14 CARRIED TO SUMMARY ON PAGE 328				[redacted]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 15 **ATHLONE ELECTRICAL WORKS (FIXED CHARGES P&G's)**				
15.	**FIXED CHARGES**				
15.1	Contractual Requirements	Sum	1	[illegible]	[illegible]
15.2	**Facilities required by Contractor:** Offices and lockable storage	Sum	1	[illegible]	[illegible]
15.3	General responsibilities and other fixed charge obligations including but not limited to fencing, barricading, storage, guarding, warning notices and lighting for the protection of the works or for the safety and convenience of the public.	Sum	1	[illegible]	[illegible]
15.4	Allow for completion of QC data pack and all certification including 'as-built' drawings (6 paper sets and 1 electronic set)	Sum	1	[illegible]	[illegible]
15.5	Removal of Site Establishment	Sum	1	[illegible]	[illegible]
15.6	Statutory Certificate of Compliance by an Electrician for the entire installation	Sum	1	[illegible]	[illegible]
15.7	Cost of Professional Indemnity Insurance relevant to the entire electrical installation under this contract	Sum	1	[illegible]	[illegible]
15.8	Travelling to site for the duration of the project	Sum	1	-	incl
15.9	Disbursements for the duration of the project	Sum	1	-	incl
15.10	Allow for 12-month guarantee period against defects in equipment and workmanship as set out in the specification but excluding abuse, wear and tear	Sum	1	-	incl
	TOTAL AMOUNT OF SCHEDULE NO. 15 CARRIED TO SUMMARY ON PAGE 328				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 16				
	ATHLONE REFURBISHMENT ELECTRICAL WORKS				
16.	**LOW VOLTAGE MOTOR CONTROL CENTRES**				
16.1	**Motor Control Centres and Distribution Boards**				
16.1.1	Manufacturing / Modification of Main MCCs & Distribution Panels, as per Ref Drawings, data sheets and to the specification.				
16.1.2	Modifications to existing Inlet Works Odour Control starters	Sum	1	119 615,00	119 615,00
16.1.3	Modifications to existing PST Odour Control Starters	Sum	1	119 615,00	119 615,00
16.1.4	Mixer MCC Modification as per Drawing: W1792-94003	Sum	1	261 422,00	261 422,00
16.1.5	New WAS (old DAF) MCC as per Drawing: W1792-94002	Sum	1	295 012,00	295 012,00
16.1.6	Treated Effluent MCC	Sum	1	33 764,00	33 764,00
16.1.7	SST MCCs	Sum	1	210 940,00	210 940,00
16.1.8	East Pump Station MCC Modification as per Drawing: W1792-94005	Sum	1	242 767,00	242 767,00
16.1.9	New West Pump Station MCC as per Drawing: W1792-94008	Sum	1	466 458,00	466 458,00
16.1.10	Blower Aux Board as per Drawing W1792-940012	Sum	1	276 750,00	276 750,00
16.1.11	Disinfection MCC	Sum	1	11 680,00	11 680,00
16.2	**Factory Acceptance Tests of Motor Control Centres and Distribution Boards**				
16.2.1	Mixer MCC addition	Sum	1	22 375,00	22 375,00
16.2.2	New WAS MCC	Sum	1	2 350,00	2 350,00
16.2.3	Treated Effluent MCC	Sum	1	650,00	650,00
16.2.4	SST MCCs	Sum	1	3 375,00	3 375,00
16.2.5	East Pump Station MCC addition	Sum	1	1 125,00	1 125,00
16.2.6	New West Pump Station MCC	Sum	1	1 575,00	1 575,00
16.2.7	Blower Aux Board	Sum	1	1 575,00	1 575,00
16.2.8	Disinfection MCC	Sum	1	900,00	900,00
				CARRIED FORWARD R	5 934 405,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	533 405,00
16.3	Delivery and Installation on Site, within the MCC Rooms of the MCCs and DBs.				
16.3.1	Modified Inlet Works Odour Control Starters	Sum	1	3 000,00	3 000,00
16.3.2	Modified PST Odour Control Starters	Sum	1	3 000,00	3 000,00
16.3.3	Mixer MCC addition	Sum	1	45 750,00	45 750,00
16.3.4	New WAS MCC	Sum	1	6 600,00	6 600,00
16.3.4	Treated Effluent MCC	Sum	1	1 650,00	1 650,00
16.3.6	SST MCCs	Sum	1	6 750,00	6 750,00
16.3.7	East Pump Station MCC addition	Sum	1	2 250,00	2 250,00
16.3.8	New West Pump Station MCC	Sum	1	6 600,00	6 600,00
16.3.9	Blower Aux Board	Sum	1	11 400,00	11 400,00
16.3.10	Disinfection MCC	Sum	1	1 650,00	1 650,00
16.4	Site Acceptance Tests inclusive of Programming and Network Configuration of the MCCs, Soft Starters, VSDs, Power Quality Analysers & Power Meters, PLCs, HMIs and UPS			4 200,00	4 200,00
16.4.1	Modified Inlet Works Odour Control Starters	Sum	1	1 500,00	1 500,00
16.4.2	Modified PST Odour Control Starters	Sum	1	4 200,00	4 200,00
16.4.3	Mixer MCC addition	Sum	1	32 025,00	32 025,00
16.4.4	New WAS MCC	Sum	1	3 150,00	3 150,00
16.4.5	Treated Effluent MCC	Sum	1	700,00	700,00
16.4.6	SST MCCs	Sum	1	4 725,00	4 725,00
16.4.7	East Pump Station MCC addition	Sum	1	1 575,00	1 575,00
16.4.8	New West Pump Station MCC	Sum	1	2 625,00	2 625,00
16.4.9	Blower Aux Board	Sum	1	2 625,00	2 625,00
16.4.10	Disinfection MCC	Sum	1	700,00	700,00
			CARRIED FORWARD	R	578 280,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	[illegible]
16.6	Supply, install, configure and commission Schneider PM 2000 or equivalent meters in to the following MCC Panels				
16.6.1	PST MCC	No	1	[illegible]	[illegible]
16.6.2	Mixer MCC	No	1	[illegible]	[illegible]
16.6.3	New WAS MCC	No	1	[illegible]	[illegible]
16.6.4	Treated Effluent MCC	No	1	[illegible]	[illegible]
16.6.5	SST MCCs	No	1	[illegible]	[illegible]
16.6.6	East Pump Station MCC	No	1	[illegible]	[illegible]
16.6.7	New West Pump Station MCC	No	1	[illegible]	[illegible]
16.6.8	Blower Aux Board	No	1	[illegible]	[illegible]
16.6.9	Disinfection PLC	No	1	[illegible]	[illegible]
16.8	Supply and install the following equipment c/w the flexible connection to the appropriate busbars within an existing Distribution Panel				
16.8.1	150A, 14kA - 3phase CircuitBreaker or equivalent	No	1	[illegible]	Rate Only
16.8.2	125A, 14kA - 3phase CircuitBreaker or equivalent	No	1	[illegible]	Rate Only
16.8.3	100A, 14kA - 3phase CircuitBreaker or equivalent	No	1	[illegible]	Rate Only
16.8.4	80A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.5	80A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.6	70A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.7	60A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.8	50A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.9	40A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.10	30A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.11	20A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.12	15A, 14kA - 3phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.13	60A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.8.14	50A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
			CARRIED FORWARD	R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	[illegible]
16.6.15	40A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.16	30A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.17	25A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.18	20A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.19	15A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.20	10A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.21	6A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.22	2A, 10kA - 1phase Circuit Breaker or equivalent	No	1	[illegible]	Rate Only
16.6.23	55kW, 10kA VSD Starter to specification	No	1	[illegible]	Rate Only
16.6.24	30kW, 10kA VSD Starter to specification	No	1	[illegible]	Rate Only
16.6.25	22kW, 10kA Soft Start / Star-Delta Starter to specification	No	1	[illegible]	Rate Only
16.6.26	15kW, 10kA Soft Start / Star-Delta Starter to specification	No	1	[illegible]	Rate Only
16.6.27	11kW, 10kA Soft Start / Star-Delta Starter to specification	No	1	[illegible]	Rate Only
16.6.28	7.5kW, 10kA DOL Starter to specification	No	1	[illegible]	Rate Only
16.6.29	5.5kW, 10kA DOL Starter to specification	No	1	[illegible]	Rate Only
16.6.30	2.2kW, 10kA DOL Starter to specification	No	1	[illegible]	Rate Only
16.6.31	0.75kW, 10kA DOL Starter to specification	No	1	[illegible]	Rate Only
16.6.32	DIN rail mounted Phoenix SAK 2.5mm Terminal	No	1	[illegible]	Rate Only
16.7	19" Rack Server Cabinets				
16.7.1	Supply and installation of 19" Rack Cabinet, 42U x 800mm deep, floor standing complete with distribution circuit breakers and 10-way socket outlet power rail to house the Network and Telemetry systems	No	1	[illegible]	[illegible]
			CARRIED FORWARD	R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		[illegible]
16.7.2	Supply and installation of 19" Rack Cabinet, 42U x 800mm deep, floor standing complete with distribution circuit breakers and 10-way socket outlet power rail to house the SCADA system	No	1	[illegible]	[illegible]
16.7.3	Supply and installation of 19" Rack Cabinet, 42U x 800mm deep, floor standing complete with distribution circuit breakers and 10-way socket outlet power rail to house the CCTV system	No	1	[illegible]	[illegible]
16.7.4	Supply and installation of 19" Rack Cabinet, 42U x 800mm deep, floor standing complete with distribution circuit breakers and 10-way socket outlet power rail to house the Access Control system	No	1	[illegible]	[illegible]
16.8	UPS				
16.8.1	Supply and install Riello Sentinel (or equivalent) High Power UPS, 1Ø in / 1Ø Out unit c/w SNMP network card. Batteries autonomy to be 30 minutes at full load; batteries and UPS to be installed within 19" rack enclosure c/w Factory Acceptance Certification. UPS to fit within the 800mm deep 19"rack or be integrated into MCC panel with an enclosure provided for the UPS and batteries.	No	1	[illegible]	[illegible]
16.8.2	Testing and Commissioning of above UPS by manufacturer on site	No	1	[illegible]	[illegible]
16.9	PLC Components				
16.9.1	Supply and installation of complete Schneider Modicon M580 Series or equivalent approved PLC system hardware for the Mixer MCC panel, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	[illegible]	[illegible]
	Provisions of PLC I/O included in overall price above:				
	Digital Input	Qty	[illegible]	[illegible]	Qty & Rate
	Digital Output	Qty	[illegible]	[illegible]	Qty & Rate
	Analog Input	Qty	[illegible]	[illegible]	Qty & Rate
	Analog Output	Qty	[illegible]	[illegible]	Qty & Rate
	Communication Interfaces (Modbus TCP/IP)	Qty	[illegible]	[illegible]	Qty & Rate
16.9.2	Supply and installation of complete Schneider (or equivalent) Modicon M580 Series or equivalent approved PLC system hardware for the WAS (old DAF) MCC into new Motor Control panel, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	[illegible]	[illegible]
			CARRIED FORWARD R		[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	[illegible]
	Provisions of PLC I/O included in overall price above:				
	Digital Input	Qty	32	[illegible]	Qty & Rate
	Digital Output	Qty	0	[illegible]	Qty & Rate
	Analog Input	Qty	6	[illegible]	Qty & Rate
	Analog Ouput	Qty	0	[illegible]	Qty & Rate
	Communication Interfaces (Modbus TCP/IP)	Qty	1	[illegible]	Qty & Rate
16.9.3	Supply and Installation of complete Schneider (or equivalent) Modicon M580 Series or equivalent approved PLC system hardware for the Treated Effluent MCC, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	[illegible]	[illegible]
	Provisions of PLC I/O included in overall price above:				
	Digital Input	Qty	64	[illegible]	Qty & Rate
	Digital Output	Qty	32	[illegible]	Qty & Rate
	Analog Input	Qty	16	[illegible]	Qty & Rate
	Analog Output	Qty	0	[illegible]	Qty & Rate
	Communication Interfaces (Modbus TCP/IP)	Qty	2	[illegible]	Qty & Rate
16.9.4	Supply and Installation of complete Schneider (or equivalent) Modicon M580 Series or equivalent approved PLC system hardware for the SST MCCs panels, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	[illegible]	[illegible]
	Provisions of PLC I/O included in overall price above:				
	Digital Input	Qty	0	[illegible]	Qty & Rate
	Digital Output	Qty	0	[illegible]	Qty & Rate
	Analog Input	Qty	0	[illegible]	Qty & Rate
	Analog Output	Qty	0	[illegible]	Qty & Rate
	Communication Interfaces (Modbus TCP/IP)	Qty	11	[illegible]	Qty & Rate
			CARRIED FORWARD	R	[illegible]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	[illegible]
16.9.5	Supply and Installation of complete Schneider Modicon M580 Series or equivalent approved PLC system hardware for the East Pump Station MCC panel, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	[illegible]	[illegible]
	Provisions of PLC I/O included in overall price above:				
	Digital Input	Qty	[illegible]	[illegible]	Qty & Rate
	Digital Output	Qty	[illegible]	[illegible]	Qty & Rate
	Analog Input	Qty	[illegible]	[illegible]	Qty & Rate
	Analog Output	Qty	[illegible]	[illegible]	Qty & Rate
	Communication Interfaces (Modbus TCP/IP)	Qty	[illegible]	[illegible]	Qty & Rate
16.9.6	Supply and Installation of complete Schneider Modicon M580 Series or equivalent approved PLC system hardware for the West Pump Station MCC into new Motor Control panel, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	[illegible]	Qty & Rate
	Provisions of PLC I/O included in overall price above:				Qty & Rate
	Digital Input	Qty	32	[illegible]	Qty & Rate
	Digital Output	Qty	0	[illegible]	Qty & Rate
	Analog Input	Qty	0	[illegible]	Qty & Rate
	Analog Output	Qty	0	[illegible]	Qty & Rate
	Communication Interfaces (Modbus TCP/IP)	Qty	1	[illegible]	Qty & Rate
			CARRIED FORWARD	R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
				BROUGHT FORWARD R	[illegible]
16.9.7	Supply and installation of complete Schneider (or equivalent) Modicon M580 Series or equivalent approved PLC system hardware for the PST MCC panel, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	327 796,00	327 796,00
	Provisions of PLC I/O included in overall price above:				
	Digital Input	Qty	192	350,00	Qty & rate
	Digital Output	Qty	32	570,00	Qty & rate
	Analog Input	Qty	8	1 [illegible]5,00	Qty & rate
	Analog Output	Qty	4	3 385,00	Qty & rate
	Communication Interfaces (Modbus TCP and Ethernet)	Qty	6	3 [illegible]5,00	Qty & rate
16.9.8	Supply and installation of complete Schneider Modicon M580 Series or equivalent approved PLC system hardware for the Disinfection MCC panel, complete with all connections, interposing relays, marshalling terminals and wiring looms as per specification for the control of the entire facility. Note that the Contractor must determine the I/O capacity for the entire installation and advise on the provision within the tender submission.	Sum	1	347 [illegible]43,00	Qty & rate
	Provisions of PLC I/O included in overall price above:				Qty & rate
	Digital Input	Qty	96	350,00	Qty & rate
	Digital Output	Qty	32	570,00	Qty & rate
	Analog Input	Qty	32	1 [illegible]65,00	Qty & rate
	Analog Output	Qty	6	3 385,00	Qty & rate
	Communication Interfaces (Modbus TCP/IP)	Qty	2	3 [illegible]5,00	Qty & rate
16.9.9	**Fibre Converter & Network Switch**				Qty & rate
16.9.9.1	16-port 1Gbit managed Ethernet switch	No	4	4 [illegible]42,00	[illegible]68,00
16.9.9.2	8-port 1Gbit managed Ethernet switch	No	20	24 321,00	486 420,00
				CARRIED FORWARD R	[illegible]82,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		[illegible]
16.9.10	**Magelis** or equivalent HMI Display				
16.9.10.1	15" Colour Touch screen	No	7	[illegible]	[illegible]
16.9.10.2	2Gb Compact Flash Memory card	No	7	[illegible]	[illegible]
16.9.11	**HMI Programming Software**				
16.9.11.1	Vijeo Designer (VJD UDT G5V**M) HMI Programming Software or equivalent approved to suite HMI	No	1	[illegible]	[illegible]
16.9.11.2	Communication Link Cable for Programming	No	1	[illegible]	[illegible]
16.9.11.3	Programming Software Manual	No	1	[illegible]	[illegible]
16.9.12	**Interposing Relays**				
	Supply installation of PLC I/O interposing relays, marshalling terminals, wiring looms and associated hardware inclusive of plastic wire numbers	No	1750	-	incl
16.10	**PLC Programming Software**				
16.10.1	Modicon Unity Pro - Large Edition (UNY SPU LFU CDS1) Programming Software or equivalent approved to suit PLC	No	1	[illegible]	[illegible]
16.10.2	Communication Link Cable for Programming	No	1	[illegible]	[illegible]
16.10.3	Programming Software Manual	No	1	[illegible]	[illegible]
16.10.4	Complete documentation package	Sets	1	[illegible]	[illegible]
16.11	**PLC System Engineering (PST)** **[Specify Qty and Hourly Rate specific to the Scope of Work]**				
16.11.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	24	[illegible]	[illegible]
16.11.2	Software Development & Documentation for PLC & HMI	Hrs	104	[illegible]	[illegible]
16.11.3	FAT	Hrs	12	[illegible]	[illegible]
16.11.4	Site Acceptance Testing	Hrs	12	[illegible]	[illegible]
16.11.5	Hot Commissioning of PLC and HMI	Hrs	15	[illegible]	[illegible]
16.11.6	PLC I/O : As-Built Mark-ups	Hrs	11	[illegible]	[illegible]
			CARRIED FORWARD R		[illegible]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	[illegible]
16.12	**PLC System Engineering (Mixers MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]**				
16.12.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	32	[illegible]	[illegible]
16.12.2	Software Development & Documentation for PLC & HMI	Hrs	[illegible]	[illegible]	[illegible]
16.12.3	FAT	Hrs	[illegible]	[illegible]	[illegible]
16.12.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.12.5	Hot Commissioning of PLC and HMI	Hrs	[illegible]	[illegible]	[illegible]
16.12.6	PLC I/O : As-Built Mark-ups	Hrs	[illegible]	[illegible]	[illegible]
16.13	**PLC System Engineering (WAS (Old DAF) MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]**				
16.13.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	[illegible]	[illegible]	[illegible]
16.13.2	Software Development & Documentation for PLC & HMI	Hrs	[illegible]	[illegible]	[illegible]
16.13.3	FAT	Hrs	[illegible]	[illegible]	[illegible]
16.13.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.13.5	Hot Commissioning of PLC and HMI	Hrs	[illegible]	[illegible]	[illegible]
16.13.6	PLC I/O: As-Built Mark-ups	Hrs	[illegible]	[illegible]	[illegible]
16.14	**PLC System Engineering (Treated Effluent MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]**				
16.14.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	[illegible]	[illegible]	[illegible]
16.14.2	Software Development & Documentation for PLC & HMI	Hrs	[illegible]	[illegible]	[illegible]
16.14.3	FAT	Hrs	[illegible]	[illegible]	[illegible]
16.14.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.14.5	Hot Commissioning of PLC and HMI	Hrs	[illegible]	[illegible]	[illegible]
16.14.6	PLC I/O: As-Built Mark-ups	Hrs	[illegible]	[illegible]	[illegible]
			CARRIED FORWARD	R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	BROUGHT FORWARD			R	২ ৭৭৭ ১৪৪,০০
16.15	PLC System Engineering (SST MCCs) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.15.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	৪	৯৫০,০০	৪ ২৫০,০০
16.15.2	Software Development & Documentation for PLC & HMI	Hrs	২.২	৬৫০,০০	১৪ ৭৫০,০০
16.15.3	FAT	Hrs	২	৬৫০,০০	১ ৭৫০,০০
16.15.4	Site Acceptance Testing	Hrs	২	৬৫০,০০	১ ৭৫০,০০
16.15.5	Hot Commissioning of PLC and HMI	Hrs	২	৬৫০,০০	১ ৭৫০,০০
16.15.6	PLC I/O : As-Built Mark-ups	Hrs	২	৫০০,০০	১ ০০০,০০
16.16	PLC System Engineering (EAST PUMP STATION MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.16.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	৭	৯৯০,০০	৭ ৪৯৫,০০
16.16.2	Software Development & Documentation for PLC & HMI	Hrs	৪১	৬৫০,০০	২৬ ৬৫০,০০
16.16.3	FAT	Hrs	৫	৬৫০,০০	৩ ২৫০,০০
16.16.4	Site Acceptance Testing	Hrs	৪	৬৫০,০০	২ ২৫০,০০
16.16.5	Hot Commissioning of PLC and HMI	Hrs	৬	৬৫০,০০	৩ ৭০০,০০
16.16.6	PLC I/O : As-Built Mark-ups	Hrs	৪	৫০০,০০	২ ০০০,০০
16.17	PLC System Engineering (WEST PUMP STATION MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.17.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	৪	৯৫০,০০	৩ ৪০০,০০
16.17.2	Software Development & Documentation for PLC & HMI	Hrs	১৬	৬৫০,০০	১০ ৪০০,০০
16.17.3	FAT	Hrs	২	৬৫০,০০	১ ৩০০,০০
16.17.4	Site Acceptance Testing	Hrs	২	৬৫০,০০	১ ৩০০,০০
16.17.5	Hot Commissioning of PLC and HMI	Hrs	২	৬৫০,০০	১ ৭৫০,০০
	CARRIED FORWARD			R	৭৩ ৪৯৫,০০

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
				BROUGHT FORWARD R	907 546,00
16.17.6	PLC I/O : As-Built Mark-ups	Hrs	2	[illegible]	1000,00
16.18	PLC System Engineering (DISINFECTION MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.18.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	12	950,00	11 400,00
16.18.2	Software Development & Documentation for PLC & HMI	Hrs	41	950,00	38 950,00
16.18.3	FAT	Hrs	7	950,00	4 650,00
16.18.4	Site Acceptance Testing	Hrs	7	950,00	4 650,00
16.18.5	Hot Commissioning of PLC and HMI	Hrs	9	950,00	8 550,00
16.18.6	PLC I/O : As-Built Mark-ups	Hrs	6	500,00	3 000,00
16.19	SCADA System Hardware & Software				
16.19.1	Server: DELL (or equivalent) : 19" rackmount CPU: I7 - 4GHz min. Memory: 8GB min. Hard Drive : Dual SATA 1TB min. in mirror format Network Interface Card - 10/100/1000 Screen - 19" rack mounted 15" LCD colour Keyboard & Mouse : 19" rack mountable keyboard tray with mini keyboard and mouse Operating System : Windows Server Accessories : all Power & Comms leads, mouse pad, software discs and license [State actual provision in a covering letter]	No	2	75 000,00	150 000,00
16.19.2	Workstation: DELL (or equivalent) : Desk Mounted PC CPU: I7 – 4GB min. Memory: 8GB min. Hard Drive : 1TB min. Network Interface Card - 10/100/1000 Screen - View Sonic or equivalent 32" LCD min. Mouse : Microsoft Optical -USB Keyboard : Microsoft -USB Operating System : Windows 10 Accessories : all Power & Comms leads, mouse pad, software discs and license ***Add Screen card to integrate 4x additional screens*** [State actual provision in a covering letter]	No	2	25 800,00	51 600,00
16.19.3	Screen - View Sonic or equivalent 32" LCD min.	No	4	1 400,00	57 600,00
				CARRIED FORWARD R	1 412 896,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	4 412 396,00
16.19.4	Dell (or equivalent) Colour Laser Network Printer	No	1	11 300,00	11 300,00
16.20	**Scada Software**				
16.20.1	Upgrading of Stand-alone Aquit Version 10 Programming Software and Tool Kit with Smart User Interface including unlimited zg licenses.	Sum	1	263 340,00	263 340,00
16.20.2	Scada configuration -				
16.20.3	* Set-up and configuration of the SCADA package.	Hrs	320	700,00	224 000,00
16.20.4	* Set-up and configuration of Workstation at the Operator Desk.	Hrs	160	900,00	144 000,00
16.20.5	* Set-up and configuration of node station at the Admin building.	Hrs	160	900,00	144 000,00
16.20.6	* State hourly rate for System Integrator if additional work is required during the course of this project	Hrs	1	900,00	Excluded
16.21	**Training of Engineering and Operational CoCT Staff (Assume 3 shifts, each requiring 8 Hrs training)** Communication Testing, Loop testing, Fault simulation & Commissioning, Inclusive of Server Hot Standby simulations	Hrs	24	900,00	21 600,00
16.22	**SCADA System Engineering (FAT) [Specify Qty and Hourly Rate specific to the Scope of Work]**				
16.22.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	40	650,00	26 000,00
16.22.2	Software Development & Documentation	Hrs	80	650,00	52 000,00
16.22.3	FAT	Hrs	11	650,00	7 150,00
16.22.4	Site Acceptance Testing	Hrs	11	650,00	7 150,00
16.22.5	Hot Commissioning	Hrs	11	650,00	7 150,00
16.23	**SCADA System Engineering (Mixers) [Specify Qty and Hourly Rate specific to the Scope of Work]**				
16.23.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	68	650,00	44 200,00
16.23.2	Software Development & Documentation	Hrs	104	650,00	67 600,00
16.23.3	FAT	Hrs	16	650,00	10 400,00
			CARRIED FORWARD	R	5 [illegible]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	BROUGHT FORWARD R				[illegible]
16.23.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.23.5	Hot Commissioning	Hrs	[illegible]	[illegible]	[illegible]
16.24	SCADA System Engineering (WAS MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.24.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	[illegible]	[illegible]	[illegible]
16.24.2	Software Development & Documentation	Hrs	[illegible]	[illegible]	[illegible]
16.24.3	FAT	Hrs	[illegible]	[illegible]	[illegible]
16.24.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.24.5	Hot Commissioning	Hrs	[illegible]	[illegible]	[illegible]
16.25	SCADA System Engineering (Treated Effluent MCC) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.25.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	[illegible]	[illegible]	[illegible]
16.25.2	Software Development & Documentation	Hrs	[illegible]	[illegible]	[illegible]
16.25.3	FAT	Hrs	[illegible]	[illegible]	[illegible]
16.25.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.25.5	Hot Commissioning	Hrs	[illegible]	[illegible]	[illegible]
16.26	SCADA System Engineering (S&T MCCs) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.26.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	[illegible]	[illegible]	[illegible]
16.26.2	Software Development & Documentation	Hrs	[illegible]	[illegible]	[illegible]
16.26.3	FAT	Hrs	[illegible]	[illegible]	[illegible]
16.26.4	Site Acceptance Testing	Hrs	[illegible]	[illegible]	[illegible]
16.26.5	Hot Commissioning	Hrs	[illegible]	[illegible]	[illegible]
	CARRIED FORWARD R				[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	10 716 665,00
16.27	SCADA System Engineering (EAST PUMP STATION) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.27.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	16	850,00	13 600,00
16.27.2	Software Development & Documentation	Hrs	34	850,00	28 900,00
16.27.3	FAT	Hrs	4	850,00	3 400,00
16.27.4	Site Acceptance Testing	Hrs	4	850,00	3 400,00
16.27.5	Hot Commissioning	Hrs	4	850,00	3 400,00
16.28	SCADA System Engineering (WEST PUMP STATION) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.28.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	7	850,00	5 950,00
16.28.2	Software Development & Documentation	Hrs	14	850,00	11 900,00
16.28.3	FAT	Hrs	2	850,00	1 700,00
16.28.4	Site Acceptance Testing	Hrs	2	850,00	1 700,00
16.28.5	Hot Commissioning	Hrs	2	850,00	1 700,00
16.29	SCADA System Engineering (DISINFECTION STATION) [Specify Qty and Hourly Rate specific to the Scope of Work]				
16.29.1	Compilation of Detailed Functional Specification & System Clarification	Hrs	23	850,00	19 550,00
16.29.2	Software Development & Documentation	Hrs	46	850,00	39 100,00
16.29.3	FAT	Hrs	7	850,00	5 950,00
16.29.4	Site Acceptance Testing	Hrs	7	850,00	5 950,00
16.29.5	Hot Commissioning	Hrs	7	850,00	5 950,00
			CARRIED FORWARD	R	10 946 485,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	10 344 455,00
16.30	**ADDITIONAL ITEMS** Other items the tenderer may consider necessary to complete the installation				
16.30.1	1) Removal of existing mech/elec/struct and transport to dept stores	Sum	1	R5 200,00	R5 200,00
16.30.2	2) Scada work	Sum	1	R5 440,00	R5 440,00
16.30.3	3)	Sum	1		
16.30.4	4)	Sum	1		
	TOTAL AMOUNT OF SCHEDULE NO. 16 CARRIED TO SUMMARY ON PAGE 326				10 770 325,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 17				
17.	ATHLONE ELECTRICAL WORKS CABLING & TERMINATIONS				
17.1	Deliver, offload and install within trenches, sleeves, cable rack or ducts the following: BLACK PVC/PILCDSTA/Cu 6600/11000V Multicore cables. (TYPE MV1)				
17.1.1	50mm² x 3 core	m	597	478,40	285 573,60
17.1.2	70mm² x 3 core	m	198	672,00	133 056,00
17.1.3	120mm² x 3 core	m	1892	803,65	1 520 364,80
17.1.4	300mm² x 3 core	m	398	2 672,25	1 063 354,50
17.2	Gland, terminate and label the following TYPE MV1 cables within a NON-HAZARDOUS AREA (i.e. CW gland)				
17.2.1	50mm² x 3 core	No	11	10 200,00	112 200,00
17.2.2	70mm² x 3 core	No	7	10 200,00	71 400,00
17.2.3	120mm² x 3 core	No	31	10 200,00	316 200,00
17.2.4	300mm² x 3 core	No	5	11 760,00	58 800,00
17.3	Modifications of TYPE MV1 cables as per the following:				
17.3.1	Supply and jointing of TYPE MV1 cables with the appropriate size Raychem splicing / joint kit. PROVISIONAL (In the event where cables are too short - Cable measured elsewhere)				
17.3.1.1	50mm² x 3 core	No	4	7 800,00	31 200,00
17.3.1.2	70mm² x 3 core	No	2	8 400,00	16 800,00
17.3.1.3	120mm² x 3 core	No	13	10 800,00	140 400,00
17.3.1.4	300mm² x 3 core	No	5	13 200,00	66 000,00
17.3.2	Disconnection and removal fom cable ways and trenches of the following TYPE MV1 cables:				
17.3.2.1	50mm² x 3 core	m	9	20,00	180,00
17.3.2.2	70mm² x 3 core	m	2	20,00	40,00
17.3.2.3	120mm² x 3 core	m	13	25,00	325,00
17.3.2.4	300mm² x 3 core	m	5	30,00	150,00
				CARRIED FORWARD R	3 794 272,50

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
				BROUGHT FORWARD R	3 799 272,05
17.4	Deliver, offload and install within trenches, sleeves, cable rack or ducts the following: BLACK PVC/SWA/PVC/C= 600/1000V Multicore and Single core cables. (TYPE F1)				
17.4.1	1.5mm² x 3 core	m	6050	25,40	171 520,00
17.4.2	1.5mm² x 4 core	m	4862	30,70	149 263,40
17.4.3	2.5mm² x 3 core	m	220	35,80	7 876,00
17.4.4	2.5mm² x 4 core	m	140	29,75	4 165,00
17.4.5	2.5mm² x 7 core	m	335	65,70	19 459,50
17.4.6	4mm² x 3 core	m	1100	41,05	45 155,00
17.4.7	4mm² x 4 core	m	55	49,10	2 700,50
17.4.8	4mm² x 7 core	m	90	89,90	8 091,00
17.4.9	6mm² x 3 core	m	715	51,40	36 751,00
17.4.10	6mm² x 4 core	m	30	60,60	1 818,00
17.4.11	10mm² x 3 core	m	80	69,60	4 188,00
17.4.12	10mm² x 4 core	m	750	83,60	62 700,00
17.4.13	16mm² x 3 core	m	135	87,05	11 751,75
17.4.14	16mm² x 4 core	m	880	107,75	78 220,00
17.4.15	25mm² x 4 core	m	2100	163,80	343 980,00
17.4.16	35mm² x 4 core	m	1320	220,15	290 598,00
17.4.17	50mm² x 4 core	m	1790	298,80	534 852,00
17.4.18	95mm² x 4 core	m	60	546,50	32 790,00
17.4.19	120mm² x 4 core	m	110	681,75	74 992,50
17.4.20	150mm² x 4 core	m	70	848,75	59 412,50
17.4.21	185mm² x 4 core	m	25	1 003,25	25 081,25
17.4.22	240mm² x 4 core	m	40	1 339,05	53 562,00
				CARRIED FORWARD R	5 799 532,45

DESIGN – BUILD OF MECHANICALAND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	5 749 392,45
17.5	Gland, terminate and label the following TYPE P 1 cables within a NON-HAZARDOUS AREA (i.e. CW gland)				
17.5.1	1.5mm² x 3 core	No	150	215,00	32 250,00
17.5.2	1.5mm² x 4 core	No	42	240,00	10 080,00
17.5.3	2.5mm² x 3 core	No	22	240,00	5 280,00
17.5.4	2.5mm² x 4 core	No	14	265,00	3 710,00
17.5.5	2.5mm² x 7 core	No	12	360,00	4 320,00
17.5.6	4mm² x 3 core	No	16	265,00	4 240,00
17.5.7	4mm² x 4 core	No	10	300,00	3 000,00
17.5.8	4mm² x 7 core	No	8	360,00	2 880,00
17.5.9	6mm² x 3 core	No	28	300,00	8 400,00
17.5.10	6mm² x 4 core	No	3	360,00	1 080,00
17.5.11	10mm² x 3 core	No	4	420,00	1 680,00
17.5.12	10mm² x 4 core	No	22	420,00	9 240,00
17.5.13	16mm² x 3 core	No	16	499,00	7 984,00
17.5.14	16mm² x 4 core	No	44	455,00	20 020,00
17.5.15	25mm² x 4 core	No	73	490,00	35 770,00
17.5.16	35mm² x 4 core	No	82	600,00	49 200,00
17.5.17	50mm² x 4 core	No	52	800,00	41 600,00
17.5.18	95mm² x 4 core	No	4	1 100,00	4 400,00
17.5.19	120mm² x 4 core	No	4	1 440,00	5 760,00
17.5.20	150mm² x 4 core	No	8	1 680,00	13 440,00
17.5.21	185mm² x 4 core	No	6	2 160,00	12 960,00
17.5.22	240mm² x 4 core	No	2	3 000,00	6 000,00
			CARRIED FORWARD	R	1 081 192,45

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
				BROUGHT FORWARD R	606 992,45
17.6	**Deliver, offload and install within trenches, sleeves, cable rack or ducts the following: BLACK PVC/ALU/PVC/Cu 300/500V Sunflex Multicore cables. (TYPE F2)**				
17.6.1	1.0 mm² x 2 Pair	m	13822	47,10	653 570,20
17.6.2	1.0 mm² x 4 Pair	m	170	67,25	11 432,50
17.7	**Gland, terminate and label the following TYPE S2 cables within a NON-HAZARDOUS AREA (compression gland)**				
17.7.1	1.0 mm² x 2 Pair	No	140	225,00	31 500,00
17.7.2	1.0 mm² x 4 Pair	No	14	350,00	4 900,00
17.8	Supply and jointing of cables with the appropriate size jointing kit in the event where cables are too short. Cable Measured elsewhere				
17.8.1	Scotchcast Splicing Kit - Size 0	No	4	360,00	1 440,00
17.8.2	Scotchcast Splicing Kit - Size 1	No	6	480,00	2 880,00
17.8.3	Scotchcast Splicing Kit - Size 2	No	4	600,00	2 400,00
17.8.4	Scotchcast Splicing Kit - Size 3	No	6	720,00	4 320,00
17.8.5	Scotchcast Splicing Kit - Size 4	No	4	960,00	3 840,00
17.8.6	Scotchcast Splicing Kit - Size 5	No	6	1 200,00	7 200,00
17.8.7	Scotchcast Splicing Kit - Size 6	No	8	1 440,00	11 520,00
17.8.8	Scotchcast Splicing Kit - Size 7	No	6	1 800,00	10 800,00
17.9	**Supply and installation of multimode fibre optic cable armoured with Corrugated Steel Tape**				
17.9.1	12-core	m	2035	42,00	85 470,00
17.10	Termination of SC-type fibre optic connector to fibre optic cable ends within patch panel for termination to the Converter. Include for testing of Fibres	No	50	600,00	30 000,00
17.11	Deliver, offload and install within sleeves, cable rack or ducts CAT 5E Shielded Twisted Pair (STP), UV Resistant, network cable complete with labelling.	m	330	30,00	9 900,00
				CARRIED FORWARD R	1 482 747,65

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	BROUGHT FORWARD R				6 982 747,65
17.12	Gland and terminate with CAT 5E RJ45 connector and label the following TYPE CAT 5E cables within a NON-HAZARDOUS AREA	No	150	300,00	45 000,00
17.13	Provision for tracing and tagging of outgoing cabling from existing MCC panels for reconnection to New MCC Panel, making use of the labour rates which must be completed as part of the tender submission	Sum	1	3 000,00	3 000,00
17.14	Man-Hours	Hrs	40	450,00	18 000,00
17.15	Megger, continuity and functional Testing, etc. as defined within the Specification	Sum	1	7 600,00	7 600,00
17.16	Provision for S16 stainless steel cable straps to tie the installed cables down onto the cable racks after the cables have been installed.	No	7500	10,00	75 000,00
17.17	ADDITIONAL ITEMS Other items the tenderer may consider necessary to complete the installation				
17.17.1	1).....	Sum	1	-	-
17.17.2	2).....	Sum	1	-	-
17.17.3	3).....	Sum	1	-	-
17.17.4	4).....	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 17 CARRIED TO SUMMARY ON PAGE 327				1 129 347,65

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 18				
	ATHLONE ELECTRICAL WORKS				
18.	**CABLE SUPPORTS**				
18.1	**Supply & Install of the following cable support systems** Heavy duty cable ladder, 316 stainless steel - 1000x75mm, supports inclusive of all splices, supports and fixing material as required.				
18.1.1	Straight Lengths	m	470	1 545,00	726 150,00
18.1.2	Equal 'T'	No	10	4 490,00	44 900,00
18.1.3	Flat Bend	No	8	3 665,00	29 320,00
18.1.4	Internal / External Bend	No	9	2 [illegible],00	20 [illegible],00
18.2	**Supply & Install of the following cable support systems** Heavy duty cable ladder, 316 stainless steel - 500x75mm, supports inclusive of all splices, supports and fixing material as required.				
18.2.1	Straight Lengths	m	1100	[illegible],00	1 [illegible],00
18.2.2	Equal 'T'	No	4	3 120,00	12 480,00
18.2.3	Reducing 'T' - 400mm-300mm	No	4	3 120,00	12 480,00
18.2.4	Flat Bend	No	20	1 [illegible],00	36 [illegible],00
18.2.5	Internal / External Bend	No	50	1 [illegible],00	92 [illegible],00
18.3	**Supply & Install of the following cable support systems** Heavy duty cable ladder, 316 stainless steel - 400x75mm, supports inclusive of all splices, supports and fixing material as required.				
18.3.1	Straight Lengths	m	150	[illegible],00	185 [illegible],00
18.3.2	Equal 'T'	No	6	2 [illegible],00	17 [illegible],00
18.3.3	Reducing 'T' - 300mm-200mm	No	4	2 [illegible],00	11 [illegible],00
18.3.4	Flat Bend	No	6	1 [illegible],00	10 230,00
18.3.5	Internal / External Bend	No	10	1 [illegible],00	17 [illegible],00
18.4	**Supply & Install of the following cable support systems** Heavy duty cable ladder, 316 stainless steel - 300x75mm, supports inclusive of all splices, supports and fixing material as required.				
				CARRIED FORWARD R	2 227 [illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	BROUGHT FORWARD R				2 221 590,00
18.4.1	Straight Lengths	m	480	770,00	374 400,00
18.4.2	Equal 'T'	No	16	2 459,00	39 360,00
18.4.3	Reducing 'T' - 200mm-100mm	No	12	2 430,00	29 160,00
18.4.4	Flat Bend	No	34	1 500,00	51 000,00
18.4.5	Internal / External Bend	No	48	1 962,50	78 200,00
18.5	Supply & Install of the following cable support systems Heavy duty cable ladder, stainless steel Grade 316-200x75mm, supports inclusive of all splices, supports and fixing material as required.				
18.5.1	Straight Lengths	m	1150	615,00	716 250,00
18.5.2	Equal 'T'	No	10	1 950,00	19 500,00
18.5.3	Reducing 'T' - 100mm-50mm	No	19	1 950,00	35 100,00
18.5.4	Flat Bend	No	26	1 290,00	33 540,00
18.5.5	Internal / External Bend	No	23	1 290,00	29 670,00
18.6	Supply & Install of the following cable support systems Heavy duty cable ladder, 316 stainless steel - 100x75mm, supports inclusive of all splices, supports and fixing material as required.				
18.6.1	Straight Lengths	m	1150	570,00	655 500,00
18.6.2	Equal T	No	35	1 640,00	57 040,00
18.6.3	Reducing T – 100mm-50mm	No	18	1 640,00	29 520,00
18.6.4	Flat Bend	No	106	1 170,00	124 020,00
18.6.5	Internal / External Bend	No	151	1 120,00	169 120,00
18.7	Supply & Install of the following cable support systems Heavy duty cable ladder, stainless steel Grade 316 - 100x75mm, supports inclusive of all splices, supports and fixing material as required.				
18.7.1	Straight Lengths	m	395	570,00	225 150,00
18.7.2	Equal T	No	32	1 640,00	52 480,00
18.7.3	Reducing T – 100mm-50mm	No	32	1 640,00	52 480,00
	CARRIED FORWARD R				5 654 430,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
				BROUGHT FORWARD R	5 554 430,00
18.8	Supply and installation of 32mm 316 stainless steel bosal within building inclusive of all stainless-steel fixing materials as required.	m	1080	75,00	81 000,00
18.9	Supply and install small quantities of 316 stainless steel Grade 316, fabricated supports for cable racking and equipment not exceeding 5kg including fixing and fastenings.	No	70	220,00	15 400,00
18.10	**Equipment Supports & Canopies**				
18.10.1	Unistrut P1000 316 Stainless Steel support of all racking within the Equipment rooms inclusive of threaded rod hangers, purling clamps and fixing hardware	m	695	480,00	333 600,00
18.10.2	Supply and fit SABS approved pictograms for Emergency Stop station complete with back plate.	No	102	385,00	39 270,00
18.10.3	Manufacture, deliver and install 316 Stainless Steel supports with canopies, suitable for mounting the E-Stop / Start Station, and Motor Isolators and Pictograms. Refer Drawing: W1792-W57101	No	102	2 200,00	224 400,00
18.10.4	Manufacture, deliver and install 316 stainless steel enclosures suitable for mounting the Analytical Instruments Refer Drawing: W1792-W57102	No	24	9 500,00	228 000,00
18.11	**ADDITIONAL ITEMS** Other items the tenderer may consider necessary to complete the installation				
18.11.1	1).....	Sum	1	-	-
18.11.2	2).....	Sum	1	-	-
18.11.3	3).....	Sum	1	-	-
18.11.4	4).....	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 18 CARRIED TO SUMMARY ON PAGE 337				5 976 430,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 19				
	ATHLONE REFURBISHMENT ELECTRICAL WORKS				
19.	**EARTHING AND BONDING**				
	Final earthing requirements to be determined by soil resistivity tests. This is to be followed by bonding integrity tests and certification.				
19.1	Supply, deliver, offload and install the following Copper earth conductors				
19.1.1	150 mm²-Insulated	m	350	219,00	76 650,00
19.1.2	70 mm²-Insulated	m	50	114,45	5 747,50
19.1.3	50 mm²-Insulated	m	140	82,75	11 585,00
19.1.4	35 mm²-Insulated	m	200	60,65	12 130,00
19.1.5	16 mm²-Insulated	m	140	25,00	3 500,00
19.1.6	16 mm²-Uinsulated	m	580	25,10	14 558,00
19.1.7	10 mm²-Insulated	m	380	19,75	7 505,00
19.1.8	6 mm²-Insulated	m	60	14,20	852,00
19.2	Termination of earth conductors with a ring lug and 316 stainless steel set screw, nut and washers.				
19.2.1	150 mm²-Insulated	No.	6	225,00	1 350,00
19.2.2	70 mm²-Insulated	No.	4	145,00	580,00
19.2.3	50 mm²-Insulated	No.	8	125,00	1 000,00
19.2.4	35 mm²-Insulated	No.	8	120,00	960,00
19.2.5	16 mm²-Insulated	No.	16	120,00	1 920,00
19.2.6	16 mm²-Uinsulated	No.	38	100,00	3 800,00
19.2.7	10 mm²-Insulated	No.	12	120,00	1 440,00
19.2.8	6 mm²-Insulated	No.	60	120,00	7 200,00
19.3	Supply and install Potential Equalizing Earth Bars, 300mm x 30mm x 5mm, c/w insulated mounting bolts and a series of 10mm dia holes with set screws, nuts and washers.	No.	4	3 480,00	13 920,00
19.4	Initial Soil Resistivity Tests	Sum	1	3 600,00	3 600,00
				CARRIED FORWARD R	187 700,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE 20				
	ATHLONE REFURBISHMENT ELECTRICAL WORKS				
20.	**CIVILS WORK ASSOCIATED WITH ELECTRICAL TRENCHING, SLEEVES AND SUBSTATIONS**				
20.1	Excavate in soft rock for trenches, backfill and compact, including removal of surplus/insultable materials to spoil off site for trenches 0.6m wide and for depth:				
20.1.1	Up to 0.6m deep	m	2350	[redacted]	[redacted]
20.1.2	Extra over item 11.1.1 for excavation in soft rock	m²	493.5	84,60	41 741,10
20.1.3	Extra over item 11.1.1 for excavation in hard rock material	m²	70.5	147,25	10 382,63
20.1.4	Extra over item 11.1.1 for imported backfill materials from:	m²	493.5	245,00	120 907,50
20.1.5	Extra over item 11.1.1 for excavation through 150mm thick reinforced concrete paving including saw cutting, breaking of concrete and dispose off site.	m²	705	457,35	322 452,75
20.1.6	Extra over item 11.1.5 for reinstatement of 150mm reinforced concrete paving	m²	705	530,63	374 094,15
20.1.7	Extra over 11.1.1 for excavation through tarmac road surface	m²	96	477,19	45 810,00
20.1.8	Extra over item 11.1.7 for reinstatement of tarmac road surface	m²	96	567,63	54 492,48
20.2	Supply, install and bed 160 mm PAC KABLE FLEX or equivalent cable sleeve in trench (trenching measured above)				
20.2.1	Straight Lengths	m	2660	73,50	195 510,00
20.2.2	Long Radius Bends	No	96	157,29	15 099,00
20.3	Supply, install and bed 100 mm PAC KABLE FLEX or equivalent cable sleeve in Electrical trench [Provisional]				
20.3.1	Straight Lengths	m	1650	44,55	73 507,50
20.3.2	Long Radius Bends	No	26	104,25	2 710,25
20.4	Supply and install Henley Compound, or equivalent cable sealant in all cable sleeves once all cables have been installed	Kg	25	155,78	4 044,44
				CARRIED FORWARD R	1 901 359,78

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		1 867 331,73
20.5	Supply and install 2mm pvc draw wires in all cable sleeves	M	4075	1,84	7 498,00
20.6	Supply and install danger tape within all trenches - Electrical	m	4075	4,29	17 481,75
20.7	Excavation of 600 x 600 x 1200 deep hole for in-ground lamp poles (measured elsewhere) casting concrete, back filling, compaction and removal of surplus material off site.	No	18	1 335,25	24 034,50
20.8	Excavation of holes for camera poles inclusive of casting of 600 x 600 x 600 concrete, back filling, compaction and removal of surplus material off site.	No	3	667,65	2 002,97
20.9	Excavation of 300 x 300 x 400 deep hole and casting of concrete plinth for equipmentsupport (measured elsewhere) and removal of surplus material off site.	No	25	110,25	2 756,25
20.10	Supply and construct the following manholes: Draw pit/Manhole: Supply material and construct the following cable sleeve manholes, comprising: 100mm concrete base c/w damp course 110mm brick walls 700x700x700mm internal dims	No	25	10 719,69	267 992,25
20.10.1	Damp course on exterior of walls Plaster internally Fit and plaster manhole - 450x600 Type 9D cast iron single sealcover and frame				
20.10.2	350mm x 350mm small drawpit frame with lid	No	16	3 439,00	54 950,00
20.11	Supply and install concrete, conical cable route markers c/w inscribed 316 stainless steel route marker plate	No	64	661,50	42 336,00
20.12	Making of hole 200mm x 200mm through 270mm concrete wall for the installation of 160mm cable sleeve complete with brick work, cement plastering and making good	No	8	1 225,00	9 800,00
20.13	Modifications and customised civil works				
20.13.1	Modification of existing MV intake room trench to join the new trench to the new MV intake room	No	4	31 101,63	124 406,52
20.13.2	Dismantling, and removal of existing lighting high mast adjacent to the existing Reactors.	No	2	103 635,00	207 270,00
			CARRIED FORWARD R		2 657 904,31

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	BROUGHT FORWARD			R	3 657 804,37
20.13.3	Supply, deliver and install new 20m high masts adjacent to the existing Reactors each containing 3 of the LED luminaires specified in Section 21.2.3	No	2	250 323,75	500 647,50
20.14	ADDITIONAL ITEMS Other items the tenderer may consider necessary to complete the installation				
20.14.1	1).....	Sum	1	-	-
20.14.2	2).....	Sum	1	-	-
20.14.3	3).....	Sum	1	-	-
20.14.4	4).....	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 20 CARRIED TO SUMMARY ON PAGE 327				4 158 452,37

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 21				
	ATHLONE REFURBISHMENT ELECTRICAL WORKS				
	ANCILLIARY EQUIPMENT				
21.	**HVAC** Supply and Install Air Conditioning - Split Unit Type : Carrier or equivalent approved, Corrosion resistant condensers, efficient inverter-driven, sized to keep the Room Temperature at 18 °C c/w weather proof isolator and all associated surface mounted conduit and wiring to cool DPFC-, MV- and Blower MCC rooms	No	6	42 783,00	254 350,00
21.1	**Lighting** Supply and Installation of Street lighting, comprising of, SABS approved LED Luminaries, light switches and all associated installation material and wiring from distribution boards. Refer Drawing: W1792-95002				
21.1.1	Type H Beka LED Lume Maxi Optic 5094 279W, or equivalent, Luminaires for Street Lighting	No	18	8 985,00	160 920,00
21.1.2	BEKA K1878100 MINERAL GREY 10.0m (above ground) GRP Pole, or equivalent, complete with - incl Single/Double Spigot (as required) - incl Baseplate Assembly 300x300x1.6 - incl Gland plate Assembly - incl MCB Circuit breaker 5A/5KA	No	18	12 040,00	216 720,00
21.1.3	Type H Beka LED Lume Maxi Optic 5094 279W, or equivalent, Luminaires for Mast Lighting	No	6	12 985,00	76 410,00
21.1.4	One lever weatherproof light switch	No	6	540,00	3 240,00
21.1.5	Supply and fit photo-electric "day/night" switches within appropriate DBs/MCC panels	No	4	750,00	3 000,00
21.1.6	Lighting Kiosk with switchgear to supply external street lighting	No	4	8 900,00	35 600,00
21.1.7	Supply and install labels to all of the above lighting equipment	Sum	1	2 200,00	2 200,00
21.1.8	Cable checking and testing of each newly installed lighting circuit in conjunction with the Engineer	Sum	1	4 400,00	4 400,00
21.1.9	Site Acceptance Testing	Sum	1	2 800,00	2 800,00
21.1.10	QA/QC Pack to Engineer's Specification	Sum	1	2 600,00	2 600,00
				CARRIED FORWARD R	762 819,00

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DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	763 510,00
21.2	**Field Equipment**				
21.2.1	**Emergency Stop/Start Station** - IP65 enclosure equipped with Schneider equipment or equivalent approved. Green 'START' push button with 1xN/O contact and a red 'STOP' Mushroom head push-pull button with 2xN/C contact. Allowance to be made for Engraved labelling, comprising the Equipment Tag Number and function of each push button. Cable entries must be at the bottom of the enclosure minimum 1x M20. To be supplied with associated 316 stainless steel stand.	No	110	2 530,00	278 300,00
21.2.2	**Emergency Stop** - IP65 enclosure equipped with Schneider equipment or equivalent approved. Red Mushroom head push-pull button with 2xN/C contact. Allowance to be made for Engraved labelling, comprising the Equipment Tag Number and function of each push button. Cable entries must be at the bottom of the enclosure minimum 1xM20. To be supplied with associated 316 stainless steel stand.	No	16	2 310,00	36 960,00
21.2.3	**FWD/Emergency Stop/REV Station** - IP65 enclosure equipped with Schneider equipment or equivalent approved. Green 'FWD' push button with 1xN/O contact, a red 'STOP' Mushroom head push-pull button with 2xN/C contact and a green 'REV' push button with 1xN/O contact. Allowance to be made for Engraved labelling, comprising the Equipment Tag Number and function of each push button. Cable entries must be at the bottom of the enclosure minimum 1x M20. To be supplied with associated 316 stainless steel stand.	No	3	2 630,00	7 890,00
21.2.4	**Extractor fan isolators** - IP65 enclosure equipped with a 60A, 3Ø lockable isolator, Schneider or equivalent approved. Allowance to be made for Engraved labelling, comprising the Equipment Tag Number and function of each push button. Cable entries must be at the bottom of the enclosure and must accommodate 2 x Size 0 glands	No	6	3 770,00	22 620,00
21.2.5	**3ph Switched Isolator** - Weatherproof, 3 Pole, pad lockable. Allowance to be made for Engraved labelling, comprising the Equipment Tag Number. Cable entries must be at the bottom of the enclosure, including bracket for outside mounting				
21.2.5.1	20A Unit	No	48	1 090,00	52 320,00
21.2.5.2	32A Unit	No	38	1 725,00	65 550,00
21.2.5.3	63A Unit	No	6	3 770,00	22 620,00
			CARRIED FORWARD	R	1 251 270,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	1 251 210,00
21.2.6.4	125A Unit	No	6	6 625,00	39 750,00
21.2.6.5	150A Unit	No	2	7 950,00	15 900,00
21.3	**Field Junction Boxes** **Supply and install IP66 weatherproof JB's including blanking plugs in un-used cable entries and terminals to join distribution and instrumentation cabling**				
21.3.1	Reactor Instrument and Valve JBs equipped with DIN rail mounted MCB's to supply the Dissolved Oxygen sensors, Fibre to copper Modbus TCP/IP converter, 8-Port Modbus TCP/IP Network Switch for the FCVs, Phoenix SAK (or equivalent) 2.5mm terminals, earth terminals, M20 cable entries and M25 cable entries as required The box must be labelled with engraved WEAV Trafolyte or equivalent labels. 316 Stainless steel boxes are preferred.	No	8	9 500,00	76 000,00
21.3.2	Submersible Mixer Motor Termination 316 stainless steel JBs equipped with DIN rail mounted SAK (or equivalent) 2.5mm terminals, earth terminals, M20 cable entries and M25 cable entries as required The box must be labelled with engraved WEAV Trafolyte or equivalent labels	No	40	850,00	34 000,00
21.3.3	Supply and install weatherproof Pratley or equivalent JB's including blanking plugs in un-used cable entries and terminals to join distributon and instrumentation cabling				
21.3.3.1	Size 0 - 4 way	No	130	440,00	57 200,00
21.3.3.2	Size 1 - 4 way	No	35	630,00	22 050,00
21.3.3.3	Size 2 - 4 way	No	35	965,00	33 775,00
21.4 21.4.1	**CCTV Equipment** Supply and installation of additional Avigilon (or equivalent) CCTV Recording Equipment and Supporting Systems for the following Plant Sections complete with concrete poles, 316 stainless steel brackets, Network Switches, UPS's, Junction Boxes, marshalling terminals, splicing kits and fibre connectors as per specification. Note, the Contractor must determine the existing CCTV server bandwidth capacity for the entire installation and advise on the provision within the tender submission. Refer Drawing: W1792-95001	Sum	1	1 274 330,00	1 274 330,00
			CARRIED FORWARD	R	2 520 775,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	2830775,00
	Areas to install additional CCTV Equipment mentioned above: Existing Control Building - Replace dome camera on 1st Floor Treated Effluent Pump Station - Add 1 dome and 1 bullet camera Filter House - Add 2 bullet cameras Filter House outside perimeter - add 2 bullet cameras SSTs - Add 3 bullet cameras BioReactor Splitter - Add one bullet camera Main site entrance - Add camera to do license plate recognition Existing MES Room - Add 2 dome cameras				
21.4.2	CCTV Testing and Commissioning:				
21.4.2.1	Cable checking, testing and commissioning of each CCTV camera and all CCTV Control and Network elements in conjunction with the Engineer and System CCTV Engineer	Sum	1	30 275,00	30 275,00
21.4.2.2	Site Acceptance Testing	Hrs	16	640,00	10 640,00
21.4.2.3	QA/QC Pack to Engineer's Specification	Sum	1	2 [illegible]00	2 800,00
21.4.2.4	Electrician Certificate of Compliance associated with as-built installation	Sum	1	4 000,00	4 000,00
21.4.2.5	As built loop and GA drawings	Sum	1	2 500,00	2 500,00
21.4.2.6	Training - Assume 3 separate training sessions on site	Sum	1	11 340,00	11 340,00
21.5	**Remote Terminal Unit relocation** Relocate the existing RTU (currently installed in the old Control Room), to the new Blower House Server Room in conjunction with the Engineer and update the tag database to reflect the necessary SCADA tags for remote monitoring.	Sum	1	35 875,00	35 875,00
21.6	**ADDITIONAL ITEMS** Other items the tenderer may consider necessary to complete the installation				
21.6.1	1).....	Sum	1	-	-
21.6.2	2).....	Sum	1	-	-
21.6.3	3).....	Sum	1	-	-
21.6.4	4).....	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 21 CARRIED TO SUMMARY ON PAGE 327				2 917 965,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO.22				
	ATHLONE ELECTRICAL WORKS				
22.	Instrumentation				
22.1	Supply and install the following Analog 4-20mA HART) and Digital (0-24VDC) instruments inclusive of necessary 316 stainless steel brackets, stands and fixing hardware as required, as detailed in the instrument list.				
22.1.1	41FE01 Flow meter Type - Type - E&H Promag or equivalent Range - 0-150m³/h at 50°C Design Pressure - 400kPag Design Temperature - 50°C Pipeline Diameter - 150mm NB	No	1	4 36,00	4 36,00
22.1.2	41FE01, 41FE04, 41FE05, 41FE10, 41FE13, 41FE16 Flow meter Type - E&H T-mass 65i or equivalent Range - 0-7000kg/h at 57°C and 55kPag Design Pressure - 100kPag Design Temperature - 80°C Pipeline Diameter - 300mm NB	No	6	54 206,00	325 236,00
22.1.3	41FE02, 41FE03, 41FE06, 41FE08, 41FE09, 41FE11, 41FE12, 41FE14, 41FE15, 41FE17, 41FE19 Flow meter Type - E&H T-mass 65i or equivalent Range - 0-4000kg/h at 57°C and 55kPag Design Pressure - 100kPag Design Temperature - 80°C Pipeline Diameter - 200mm NB	No	12	54 846,00 [redacted]	658 152,00
22.1.4	48PT01 Pressure Transmitter Type - E&H PMC51 or equivalent Normal Operating Pressure - 60kPag Design Pressure - 100kPag Design Temperature - 80°C	No	3	10 528,00	31 584,00
22.1.5	48TE01 Temperature Transmitter complete with Thermowell Type - E&H RTD or equivalent Normal Operating Temperature - 100°C Design Pressure - 100kPag Design Temperature - 80°C Pipeline Diameter - 1200mm NB	No	1	5 346,00	5 346,00
				CARRIED FORWARD R	1 064 736,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO.22				
	ATHLONE ELECTRICAL WORKS				
22.	**Instrumentation**				
22.1	Supply and Install the following Analog 4-20mA HART) and Digital (0-24 VDC) instruments inclusive of necessary 316 stainless steel brackets, stands and fixing hardware as required, as detailed in the instrument list				
22.1.1	**44FE01** Flow meter Type - Type - E&H Promag or equivalent Range - 0-150m³/h at 50°C Design Pressure - 400kPag Design Temperature - 50°C Pipeline Diameter - 150mm NB	No	1		
22.1.2	**41FE01, 41FE02, 41FE04, 41FE05, 41FE07, 41FE08, 41FE10, 41FE11, 41FE13, 41FE14, 41FE16, 41FE17** Flow meter Type - E&H T-mass 65I or equivalent Range - 0-7000kg/h at 57°C and 55kPag Design Pressure - 100kPag Design Temperature - 80°C Pipeline Diameter - 300mm NB	No	12		
22.1.3	**41FE03, 41FE06, 41FE09, 41FE12, 41FE15, 41FE18** Flow meter Type - E&H T-mass 65I or equivalent Range - 0-4000kg/h at 57°C and 55kPag Design Pressure - 100kPag Design Temperature - 80°C Pipeline Diameter - 200mm NB	No	6		
22.1.4	**45PT01** Pressure Transmitter Type - E&H PMC51 or equivalent Normal Operating Pressure -60kPag Design Pressure - 100kPag Design Temperature - 80°C	No	3		
22.1.5	**45TE01** Temperature Transmitter complete with Thermowell Type - E&H RTD or equivalent Normal Operating Temperature - 100°C Design Pressure - 100kPag Design Temperature - 80°C Pipeline Diameter - 1200mm NB	No	1		
				CARRIED FORWARD R	

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		1 [illegible]
22.1.6	41XE01, 41XE02, 41XE03, 41XE04, 41XE06, 41XE06, 41XE07, 41XE08, 41XE09, 41XE10, 41XE11, 41XE12, 41XE13, 41XE14, 41XE15, 41XE16, 41XE17, 41XE18 Dissolved Oxygen Meter with stand and sensor holder Type E&H, HACH or equivalent Normal dissolved oxygen concentration = 2mg/l at 4000mg/l TSS Medium - Activated sludge Design Pressure - Atm Design Temperature – Amb	No	18	[illegible]	[illegible]
22.1.7	41LT01, 41LT02, 44LT01, 44LT02, 43LT03, 43LT04, 43LT05, 43LT06 Level Transmitter Type – E&H FMU or equivalent Medium - Mixed liquor at 20°C Range - 0 - 5m Design Temperature - 50°C	No	8	[illegible]	[illegible]
22.1.8	42FS01, 42FS02, 42FS03, 42FS04, 43FS05, 42FS06, 44FS01, 44FS02 Flow switch Type – DWYER TDFS Thermal Probe or equivalent Flow setpoint range – 0.15m/s - 3m/s	No	8	[illegible]	[illegible]
22.1.9	42LSH01, 42LSH02, 44LSH03 Level switch Type – KARI Conductivity or equivalent Micro Switch output	No	3	[illegible]	[illegible]
22.2.1	45PI01, 41PI01, 41PI02, 41PI03 Pressure Gauge with contacts Type – Bourdon Type Ashcroft or equivalent Range - 0 - 100kPag Design Pressure - 100kPag Design Temperature - 60°C	No	4	[illegible]	[illegible]
22.2.2	42PI01, 42PI02, 42PI03, 42PI04, 42PI05, 42PI06, 42PI07, 42PI08, 42PI09, 42PI10, 42PI11, 42PI12 Pressure Gauge with contacts Type - Bourdon Type with a chemical seal Range - 0 - 100kPag Design Pressure - 100kPag Design Temperature - 60°C	No	12	[illegible]	[illegible]
			CARRIED FORWARD R		2 162 [illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	2 762 196,00
22.2.4	41T101 Temperature Gauge complete with Thermowell and contacts Type - Bimetal type, Ashcroft or equivalent Range - 0 - 100°C Design Pressure - 100kPag Design Temperature - 100°C Pipeline Diameter - 1200mm NB	No	1	2 949,00	2 949,00
22.2.5	41T101, 41T102, 41T103 Temperature Gauge complete with Thermowell and contacts Type - Bimetal type, Ashcroft or equivalent Range - 0 - 100°C Design Pressure - 100kPag Design Temperature - 100°C Pipeline Diameter - 300mm NB	No	3	6 721,00	20 163,00
22.3	Loop Checking, testing and commissioning of each instrument and control elements in conjunction with the Engineer and System Integrator	Sum	1	46 150,00	46 150,00
22.4	Cable and Terminate the following Electrical Multi-turn Actuators communicating via Modbus TCP/IP as required, as detailed in the valve list.				
22.4.1	41FCV01, 41FCV04, 41FCV07, 41FCV10, 41FCV13, 41FCV16 Flow Control Valve Actuator complete with a Modbus TCP/IP communication interface Type - Electric Multi-turn Supply - 3 Phase 400VAC Design Temperature - 60°C Pipeline Diameter - 300mm NB	No	6	1 650,00	9 900,00
22.4.2	41FCV02, 41FCV03, 41FCV05, 41FCV06, 41FCV08, 41FCV09, 41FCV11, 41FCV12, 41FCV14, 41FCV15, 41FCV17, 41FCV18 Flow Control Valve Actuator complete with a Modbus TCP/IP communication interface Type - Electric Multi-turn Supply - 3 Phase 400VAC Design Temperature - 60°C Pipeline Diameter - 200mm NB	No	12	1 650,00	19 800,00
			CARRIED FORWARD	R	2 864 640,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	
22.2.4	46TI01 Temperature Gauge complete with Thermowell and contacts Type - Bimetal type, Ashcroft or equivalent Range - 0 - 100°C Design Pressure - 100kPag Design Temperature - 100°C Pipeline Diameter - 1200mm NB	No	1		
22.2.5	41TI01, 41TI02, 41TI03 Temperature Gauge complete with Thermowell and contacts Type - Bimetal type, Ashcroft or equivalent Range - 0 - 100°C Design Pressure - 100kPag Design Temperature - 100°C Pipeline Diameter - 300mm NB	No	3		
22.3	Loop Checking, testing and commissioning of each instrument and control elements in conjunction with the Engineer and System Integrator	Sum	1		
22.4	Cable and Terminate the following Electrical Multi-turn Actuators communicating via Modbus TCP/IP as required, as detailed in the valve list.				
22.4.1	41FCV01, 41FCV02, 41FCV04, 41FCV05, 41FCV07, 41FCV08, 41FCV10, 41FCV11, 41FCV13, 41FCV14, 41FCV16, 41FE17 Flow Control Valve Actuator complete with a Modbus TCP/IP communication interface Type - Electric Multi-turn Supply - 3 Phase 400VAC Design Temperature - 60°C Pipeline Diameter - 300mm NB	No	12		
22.4.2	41FCV03, 41FCV06, 41FCV09, 41FCV12, 41FCV15, 41FCV18 Flow Control Valve Actuator complete with a Modbus TCP/IP communication interface Type - Electric Multi-turn Supply - 3 Phase 400VAC Design Temperature - 60°C Pipeline Diameter - 200mm NB	No	6		
			CARRIED FORWARD	R	

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DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	2 361 660,00
22.5	Actuator commissioning:				
22.5.1	Allow for the Supplier of the Actuators to assist the Mechanical Contractor during the installation phase, and to configure and commission the abovementioned Actuators.	Sum	1	22 000,00	22 000,00
22.5.2	Allow for Loop Checking, Testing and Commissioning of each Actuator in conjunction with the Engineer and the Supplier of the Actuator	Sum	1	24 650,00	24 650,00
22.6	ADDITIONAL ITEMS Other items the tenderer may consider necessary to complete the installation				
22.6.1	1).....	Sum	1	–	–
22.6.2	2).....	Sum	1	–	–
22.6.3	3).....	Sum	1	–	–
22.6.4	4).....	Sum	1	–	–
	TOTAL AMOUNT OF SCHEDULE NO. 22 CARRIED TO SUMMARY ON PAGE 337				2 [redacted] 310,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO.23				
23.	**ATHLONE REFURBISHMENT ELECTRICAL WORKS MV INTAKE**				
23.1	**Intake Substation MV Switchgear** With reference to the Detailed Specification at rated 12kV and IP53 Water and dust Ingress Protection, Manufacture, FAT, Deliver and Install the following MV Switchgear and ancillary equipment within a new Sub Station. Cost to include all CT's VT's, ancillary items and procedures that may be required for the Installation. Conformal coatings to be applied to all electronic PCB's. (Refer to drawing W1782-94007 and datasheets for switchgear details)				
23.1.1	ABB Unigear (or equivalent) **Incomer panel with metering.** To include motorised circuit breaker and **SEL 751** (or equivalent) protection relay. Two of the three incomers will be equipped with Solkor Differential Protection Relay	No	3	630 242,40	1 890 726,20
23.1.2	ABB Unigear (or equivalent) **Blower Starter panel.** To include motorised circuit breaker and **ABB REM615** (or equivalent) protection relay for blower motors.	No	4	536 005,90	2 144 023,60
23.1.3	ABB Unigear (or equivalent) **Feeder panel.** To include motorised circuit breaker and **SEL 751** (or equivalent) protection relay. In addition, three of these will be equipped with the Solkor Differential Protection Relays (or equivalent)	No	16	445 617,05	7 129 873,20
23.1.4	ABB Unigear (or equivalent) **Bus Tie panel.** To include motorised circuit breaker and **SEL 751** (or equivalent) protection relay	No	3	432 364,95	1 297 094,85
23.1.5	ABB Unigear (or equivalent) **Bus Riser panel,** to be combined with the bus ties, rated to City requirements of 12kV and IP53. *Note that the Protection Relay, SCADA Interface Network Switch and the Power Analysers must be accommodated within the Bus Tie Panels*	No	3	153 418,85	460 256,55
23.1.6	ABB Unigear (or equivalent) **Earthing panel**	No	1	196 053,05	196 053,05
23.1.7	Design, Supply and installation of Unigear (or equivalent) Arc Vent ducting to ABB Specification (or equivalent) Details to be motivated with tender submission.	Sum	1	-	incl
23.1.8	Supply and Installation of galvanised floor frame for entire MV panel	Sum	1	223 242,40	223 242,40
				CARRIED FORWARD R	14 154 241,25

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			CARRIED FORWARD	R	[illegible]
23.1.9	Supply and installation of circuit breaker trolleys for each of the individual Unigear (or equivalent) panels	No	30	[illegible]	[illegible]
23.1.10	Supply and install PM8000, or equivalent approved, Energy Meter in new MV Panel complete with summation metering from the three Incomers (Refer Item 23.1.11 for actual CT's) and Metering Software	No	1	"	[illegible]
23.1.11	Supply and installation of Power Quality Analyser Elspec G4K or equivalent, inclusive of associated diagnostic software for local and remote access, cabling and wireways and installed within the Bus Tie Panels. Summation CT's to be provided in order to summate inputs from the three Incomers	No	1	[illegible]	[illegible]
23.2	Full Factory Acceptance Testing is to be performed. The cost to include all flight and accommodation costs for the City representative, Professional Team representative and Contractor's Designated Electrical Design Engineer.	Sum	1	[illegible]	[illegible]
23.3	Transportation of all equipment to site, offloading, rigging and installation, inclusive of all material and consumables, within the appropriate ground floor areas.	No	1	[illegible]	[illegible]
23.4	**MV Equipment Testing & Commissioning**				
23.4.1	Full grading study and calculation of MV protection settings by protection specialist to include for all the Intake Substation Switchgear and all new loads installed on the site. The study must also include the calculations and settings for the upstream Electricity Services substation, which will need to be presented to the City representatives for review and approval. The cost must include interfacing with the Electricity Services department to obtain existing information on their upstream substation settings and advising them on required adjustments.	Sum	1	[illegible]	[illegible]
23.4.2	Pressure Test, Meggar, continuity and functional Testing, etc. as defined within specification QA/AC Pack to Engineer's specification, inclusive of testing of all MV cable installed.	Sum	1	[illegible]	[illegible]
23.4.3	Site Acceptance Test, injection and cold commissioning tests	Sum	1	[illegible]	[illegible]
23.4.4	Functional and Hot commissioning tests	Sum	1	[illegible]	[illegible]
23.4.5	MV Safety report to be issued by the design engineer for the MV installation	Sum	1	[illegible]	[illegible]
23.4.6	Statutory Certificate of Compliance by an Installation Electrician for the MV installation	No	1	[illegible]	[illegible]
			BROUGHT FORWARD	R	[illegible]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			CARRIED FORWARD R		1044 947,35
23.6	BTU				
23.6.1	Supply, Deliver, Install and Commision a 30VDC Bluegingar (or equivalent) BTU on site in the MV Intake room. BTU to support at least 8 hours of standing load for the installed equipment	No	1	46 795,00	46 795,00
23.6.2	Supply, Deliver, Install and Commission a BTU - DC Distribution Board, to suit the Sub Station requirements	Sum	1	25 800,00	25 800,00
23.6	UPS				
23.6.1	Supply and install Riello Sentinel (or equivalent) High Power UPS, 1Ø In / 1Ø Out unit c/w SNMP network card. Batteries autonomy to be 60 minutes at full-load. UPS together with batteries to be accommodated within the wall mounted cubicle. Allowance to be made for installation of power source to the UPS from the local distribution panel which will be installed within a separate contract.	Sum	1	52 780,00	52 780,00
23.6.2	Supply, Deliver, Install and Commission UPS power and communication equipment and cabling	Sum	1	3 000,00	3 000,00
23.7	Transformers				
23.7.1	With reference to the Detailed Specification, Manufacture, Factory Acceptance Testing, Supply, Storage of the following 315 KVA Blower House Auxiliary Transformer	No	1	224 434,00	224 434,00
23.7.2	Transportation, offload and placing in position of the above 315KVA Transformer on site	No	1	2 400,00	2 400,00
23.7.3	Full commissioning of the transformer on site, inclusive of testing and demonstrating the Buchols, Temperature and Pressure Tripping functionality in conjunction with the MV Switchgear.	Sum	1	1 500,00	1 500,00
23.8	Spares				
23.8.1	Cost of spares holding on site. Schedule of spares shall be provided as to what has been included under this heading	Sum	1	65 424,55	65 424,55
			1	38 [redacted]	[redacted]
23.9	Removal of existing MV Intake Panel				
23.9.1	Make safe, disconnect, strip out and remove existing MV Switchgear and associated busbars	Sum	1	30 000,00	30 000,00
23.9.2	Transportation of old MV Intake Panel from site, (allow for a truck with a crane) loading, rigging and offloading, inclusive of all material and consumables to a storage area provided by the City of Cape Town.	Sum	1	25 000,00	25 000,00
			BROUGHT FORWARD R		1 924 972,90

[redacted]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	CARRIED FORWARD R				[illegible]
23.10	**MV Room SCADA Interface** Provide a Network Interface Panel to link the SCADA with the MV Switchroom and Generators (Refer to drawing W1792-68001)	Sum	1	[illegible]	[illegible]
23.11	Allow for painting of the MV Intake Room, and Blower Aux Room flooring with an industrial epoxy paint to City specification both before and after equipment installation	Sum	1	[illegible]	[illegible]
23.12	Supply and installation of A0 Snapper frame for mounting of A0 sized, SLD's and schematics	Sum	1	[illegible]	[illegible]
23.13	**ADDITIONAL ITEMS** Other items the tenderer may consider necessary to complete the installation				
23.13.1	1) [illegible]	Sum	[illegible]	[illegible]	[illegible]
23.13.2	2) [illegible]	Sum	1		
23.13.3	3) [illegible]	Sum	1	[illegible]	[illegible]
23.13.4	4).....	Sum	1		
	TOTAL AMOUNT OF SCHEDULE NO. 23 CARRIED TO SUMMARY ON PAGE 127				[illegible]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO.24				
	ATHLONE ELECTRICAL WORKS				
24.	**BUSBAR**				
24.1	**GENERATOR BUSBARS** **Deliver, offload and install with appropriate supporting brackets the following: (Contractor to verify the quantities)** Resin Encapsulated Copper Busbar 65kA IP55 400V (Triple Pole + 100% Neutral Pole + 25% Earth, all to be encapsulated) system between the step-up transformers and gensets. Busbars to be rated at 125% of the Generator output and to 1.6A/mm².				
24.1.1	Busbar	m	72	[illegible]	[illegible]
24.1.2	Bends	No	12	[illegible]	[illegible]
24.1.3	Generator terminations complete with flexible connections	No	4	[illegible]	[illegible]
24.1.4	Step-Up transformer terminations complete with flexible connections	No	4	[illegible]	[illegible]
24.2	**DPFC BUSBARS** **Deliver, offload and install with appropriate supporting brackets the following: (Contractor to verify the quantities)** Resin Encapsulated Copper Busbar 65kA IP55 400V (Triple Pole + 100% Neutral Pole + 25% Earth, all to be encapsulated) system between the DPFC Panels and the 5MVA Step-Down Transformers. Busbar to be rated at 125% of the DPFC output and to 1.6A/mm².				
24.2.1	Busbar	m	44	[illegible]	[illegible]
24.2.2	Bends	No	8	[illegible]	[illegible]
24.2.3	DPFC panel end terminations complete with flexible connections	No	2	[illegible]	[illegible]
24.2.4	Typically 5.0 MVA, step-down transformer terminations complete with flexible connections	No	2	[illegible]	[illegible]
24.3	**ADDITIONAL ITEMS** Other items the tenderer may consider necessary to complete the installation				
24.3.1	1) Adapter Boxes (If Required)	Lot	1	10 166,00	Once only
24.3.2	2).....	Lot	1	-	-
24.3.3	3).....	Lot	1	-	-
24.3.4	4).....	Lot	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 24 CARRIED TO SUMMARY ON PAGE 327				[illegible]

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO.25				
	ATHLONE ELECTRICAL WORKS - GENSET				
25.	**GENERATING SET AND DIESEL SYSTEM**				
25.1	**GENSETS** With reference to the Detailed Specification, Manufacture, Testing, Supply, Storage and Delivery of the following Diesel Generating Sets, together with base frames and all ancillaries. Generators and all ancillaries to be corrosive resistant.				
25.1.1	**Design and Manufacture of the Generator sets** Design and Manufacture of 2MVA Generator sets with discrete Control Panels, c/w Deep Sea Controller (or equivalent) capable of synchronised switching, Main Circuit Breakers and marshaling terminals for the integration of 6 Master Controllers as itemised below. Heaters to be included within the alternator to keep the machine warm when not in use. Refer tender specification for further general requirements and details. Prime Mover Make and Model Generator make, Model & Capacity Generator Controller Make and Model Main Circuit Breaker Size, Make and Model	No	2	4 [illegible]	[illegible]
25.1.2	**Design and Manufacture of Genset Master Control Panel** Design and Manufacture of a Deep Sea Master (or equivalent) Synchronisation Panel either in a floor standing setup or incorporated into the main MV intake panel c/w an HMI and marshalling terminals to interconnect the various digital and analogue signals from the MV Circuit Breakers, VT's CT's and the 4 off Generator Controllers; This Master Synchronisation Panel is required to manage the change-over and synchronisation between the 4 off gensets and the main MV intake panel. This Master Synchronisation Panel is to include a Deep Sea (or equivalent) GSM Ethernet gateway modem with antennae and 3G Sim with data contract for 24 month. *Master Controller Make and Model*	Sum	1	[illegible]	[illegible]
25.1.3	**2MVA Genset Master Controller network interfaces** Supply of all network interfaces, network and control cabling required between the 2MVA Genset Control Panels and Genset Master Synchronisation Panel. Cost to include extension boxes, wireways and any other material that may be required.	Sum	1	12 [illegible]	12 [illegible]
25.1.4	**1.25MVA Genset Master Controller network interfaces** Modify or adapt existing 1.25MVA Genset network interfaces, network and control cabling to interface with the Genset Master Synchronisation Panel. Cost to include extension boxes, wireways and any other material that may be required.	Sum	1	12 [illegible]	12 [illegible]
				CARRIED FORWARD R	10 [illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
				BROUGHT FORWARD R	640 173,20
25.1.5	**Genset Master Control Panel and MV Changeover Panel Interface** Supply of all control cabling (digital and analogue I/O cable interfaces), network cards and network cables between the MV Circuit Breakers, VT's, CT's and the Genset Master Synchronisation Panel. Cost to include extension boxes, wireways and any other material that may be required.	Sum	1	15 500,00	15 500,00
25.1.6	**Genset PLC and SCADA Interface** Supply of all network interfaces, network and control cabling required between the four Gensets, Genset Master Synchronisation Panel and the PLC and SCADA system. Cost to include extension boxes, wireways and any other material that may be required.	Sum	1	16 500,00	16 500,00
25.2 25.2.1	**Genset Inlet and Outlet Sound Attenuation** Design, manufacture, supply and installation of inlet and outlet sound attenuation for 2 x 1.25MVA gensets in a shared room, to yield less than 65dBA	Sum	1	403 765,80	403 765,80
25.2.2	Design, manufacture, supply and installation of inlet and outlet sound attenuation for 2 x 2MVA gensets, in a shared room, to yield less than 65dBA	Sum	1	458 117,00	458 117,00
25.3	**Exhaust Systems Lagging and Cladding** Lagging and 316 stainless steel cladding to the full Exhaust systems of the 2MVA and 1.25MVA gensets. Lagging to reduce the surface temperature of the cladding to below 50°C.	Sum	1	231 600,00	231 600,00
25.4 25.4.1	**Genset Test Fuel** Supply of all lubricants and fuel to conduct both the Factory and Site Acceptance tests for the two 2MVA Gensets, it is assumed the 1.25MVA Gensets have enough fuel available for test purposes.	Sum	1	62 171,00	62 171,00
25.4.2	Supply of all lubricants for the 2MVA Gensets, and first complete fill of fuel for the bulk tank, and all the Genset's service tanks.	Sum	1	256 000,00	256 000,00
25.5 25.5.1	**Factory Acceptance Tests** Load tests to be carried out which must include the supply, transportation and use of adequately size load banks to fully load test the gensets at the Factory during the FAT.	Sum	1	577 161,20	577 161,20
25.5.2	In addition to the discrete Generator FAT as specified, the communication link between the 2MVA Genset Controllers and Generator Synchronisation Controller must be tested by the Contractor.	Sum	1	4 140,40	4 140,40
				CARRIED FORWARD R	2 564 675,40

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		12 154 975,40
25.6	**Delivery to site**				
25.6.1	Delivery of all equipment to site, offloading, rigging and installation, inclusive of all material and consumables, within the appropriate ground floor areas.	No	1	R2 110,00	R2 110,00
25.6.2	Protection of equipment during construction	Sum	1	R5000,00	R5 000,00
25.7	**Site Acceptance Testing** Rigorously complete the Site Testing and Commissioning by simulating all permutations of normal and fault conditions of all four Gensets. In addition to the discrete Generator tests as specified, the communication link between the existing 1.25MVA Genset Controllers, new 2MVA Genset Controllers, Generator Master Synchronisation Controller, MV Changeover Panel and PLC and SCADA must be loop checked, tested and commissioned by the Contractor.				
25.7.1	Labour	Days	5	R5000,00	R25 000,00
25.7.2	Disbursements	Days	5	R 1 560,00	R 7 800,00
25.8	**Training** Comprehensive, 1st line of support and operational training to CoCT personnel, inclusive of appropriate manuals and drawings				
25.8.1	Labour	Days	1	R 4 000,00	R 4 000,00
25.8.2	Disbursement Supplier to make adequate provision by stating the QTY and Rate	Days	1	R 240,00	R 240,00
25.9	**Maintenance & Guarantee**				
25.9.1	Maintenance for twelve [12] months of the 2 x 2MVA Generators	Sum	1	R9 700,00	R9 700,00
25.9.2	Cost of spares holding on site for the 2 x 2MVA Generators. Schedule of spares shall be provided as to what has been included under this heading.	Sum	1	R2 874,00	R2 874,00
25.10	**Generator Transformers**				
25.10.1	With reference to the Detailed Specification, Manufacture, Factory Acceptance Testing, Supply, Storage of the following 2 MVA Generator Step-Up Transformer (Refer to datasheets for specification)	No	1	R129 761,00	R129 761,00
25.10.2	Transportation, offload and placing in position of the above 2000kVA Transformer on site	No	1	R 290,00	R 290,00
			CARRIED FORWARD R		R13 019 254,40

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		[illegible]
25.10.3	Full commissioning of the transformer on site, inclusive of testing and demonstrating the Bucholz, Temperature and Pressure Tripping functionality in conjunction with the MV Switchgear.	Sum	1	1 650,00	1 650,00
25.10.4	With reference to the Detailed Specification, Manufacture, Factory Acceptance Testing, Supply, Storage of the following 1.5 MVA Generator Step-Up Transformers (Refer to datasheets for specification)	No	2	623 141,20	1 246 282,40
25.10.5	Transportation, offload and placing in position of the above 1500kVA Transformers on site	No	2	5 250,00	10 500,00
25.10.6	Full commissioning of the transformers on site, inclusive of testing and demonstrating the Bucholz, Temperature and Pressure Tripping functionality in conjunction with the MV Switchgear.	Sum	1	1 650,00	1 650,00
25.11	Complete relocation of the existing Generator system which should include for a truck with crane to remove the existing Gensets, panels diesel tanks, diesel fuel piping, busbars, transformer and all cabling from the current location to the new location in the new Generator room	Sum	1	550 000,00	550 000,00
25.12	Appropriate ear protection for site personnel, together with suitable storage container to be mounted within generator room	Sum	1	6 600,00	6 600,00
25.13	Statutory Signage as required by OHSA and SANS 10142 for Generator rooms	Sum	1	3 850,00	3 850,00
25.14	Protection of equipment during construction	Sum	1	5 500,00	5 500,00
25.15	Allow for painting of the Generator Rooms flooring with an industrial epoxy paint to City specification both before and after equipment installation	Sum	1	84 705,71	84 705,71
25.16	**Ancillary Equipment & Spares** The Supplier is to define any ancillary equipment which may be required to ensure that all Generator equipment is fully functional. This includes, but is not limited to, all material and equipment required for the interconnection of each Unit.				
25.16.1	1) Spares	Lot	1	44 000,00	44 000,00
25.16.2	2)	Lot	1		
25.16.3	3)	Lot	1		
25.16.4	4)	Lot	1		
			CARRIED FORWARD R		[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD	R	[illegible]
25.17	**Diesel Fuel System** Supply and install the diesel fuel system from the bulk diesel tank to the generator sets. Starting at the site diesel filling point and bulk diesel tank, this work entails all equipment and signalling up to and including each 1.25MVA and 2MVA Generator Set's fuel components.				
25.17.1	Compilation of Detailed Design & System Clarification for the full diesel fuel distribution system for the generator(s). Refer to Drawing W1792-45005 for a typical concept.	Sum	1	6 600,00	6 600,00
25.17.2	UPS Powered Diesel Fuel Control Panel inclusive of appropriate PLC incl. Modbus TCP/IP communication to the plant main PLC and SCADA of all flow and level metering, safety interlocks etc. To be corrosive resistant and comply with the Specifications. Panel to be located in a Safe Area	No	1	21 500,00	21 500,00
25.17.3	Supply, Deliver and Install the necessary hardware for the Diesel Fuel Distribution System containing as a minimum the following items all to be made from 316SS and to be anti-corrosive: - Bulk Tank Filtration system incl automatic water trap - Mechanical and Electronic fuel level metering of bulk tank - Full Bulk Tank indication and or annunciation - Automatic shut-off valves to service tanks - Filling Point inclusive of bund, dry-break - Anti-fuel theft device - E-fuel tagging together with all electrical connections needed - Bulk Tank Back Pressure Regulated valve - Ex n Rated (Non sparking) Pumps - Mechanical Pressure Indicators - Electronic Differential Pressure Transmitters - Full Bore Ball Valves - Fusible fire links and weighted pulley systems - Non-return Valves - Strainers - Ex n Rated Solenoid Valves - Diesel Filters - Piping, flanges, fittings, gaskets, supports, brackets etc - Ex n Rated Leak Detector Units interfaced with the Diesel Control Panel - Hazardous area classifications and certifications - Allowance for any additional items for the fuel system deemed necessary by the tenderer	Sum	1	[illegible]	[illegible]
			CARRIED FORWARD	R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	BROUGHT FORWARD R				[illegible]
25.17.4	SAT and commissioning of the abovementioned Diesel Fuel Distribution System by the Contractor	Sum	1	4 920,00	4 920,00
25.18 25.18.1	Diesel Fuel Tanks 9,000 litre 316 stainless steel bulk fuel tank with stand, ready for electronic level metering and all piping connections to be fitted. To include mechanical, overfill protection. Tank to be painted with diesel resistant and corrosive resistant paint. Refer tender specification for further details.	Sum	1	250 192,10	250 192,10
25.18.2	Genset service tanks to be integral to the newly supplied gensets	No	2	-	incl
25.19	Sealing of bulk tank bund with outdoor, anti-corrosive, diesel proof sealant	Sum	1	21 500,00	21 500,00
25.20	ADDITIONAL ITEMS Other items the tenderer may consider necessary to complete the installation				
25.20.1	1) P&G Refer to electrical estimation in tenderer P&G for item 25.17.5 +10% and For main contractor	Lot	1	82 500,00	82 500,00
25.20.2	2) [illegible]	Lot	1	-	-
25.20.3	3) Mandatory Item: Design & manufacture zone, and isolate & remove tenderer gate through and redundant system up spec as noted	Lot	1	545 175,67	545 175,67
25.20.4	4) [illegible] per drawings & to rep to inform bef of any welding with app. of ewl	Lot	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 28 CARRIED TO SUMMARY ON PAGE 327				1 353 775,18

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
	SCHEDULE NO. 28				
	ATHLONE ELECTRICAL WORKS – DPFC				
28.	**DYNAMIC FACTOR POWER CORRECTION**				
28.1	**DPFC Equipment**				
28.1.1	With reference to Section 8 of the Detailed Electrical Specification, Design, Manufacture, Installation and Commissioning of two Dynamic Power Factor Correction Systems together with a Power Quality Analyser i.e. one on either as per indication on tender single line diagram W1792-8A007. Each system is to include both starting and running dynamic power factor correction. The upstream electrical network information is to be referred to in order to provide the correct sizing of the DPFC KVAR. Conformal coatings to be applied to all electronic PCB's. The DPFC systems to be compatible with and be able to run together with the generator systems as the source of electrical supply. The Specialist Contractor is to state within a covering letter the provisions made for: (a) Starting kVA & number of steps (b) Run KVA & number of steps (c) Inductance (d) Controller Type & Quantity (e) Step Down Transformer Rating if applicable (f) Power Quality Analyser. To be integrated with site Scada. (g) Summation meters to be included with the DPFC systems (h) Generator Controller Cards to be included with the DPFC systems in order to operate with and support the generator systems	Sum	1	19 920 400,00	19 920 400,00
28.1.2	Marshalling cubicle to provide a termination point for the integration of all the DPFC plant information with the site SCADA. The intention is to be able to monitor the status of the DPFC controllers as well as both Quality of Supply Meters.	Sum	1	-	Incl in 28.1.1
28.2	**Factory Acceptance Tests** Full Factory Acceptance Testing is to be performed, which must include testing under suitable loads. The cost to include all flight and accommodation costs for the City representative, Professional Team representative and Contractor's Designated Electrical Design Engineer. In addition to the discrete DPFC tests, as specified, the Communication link between the DPFC and the MV Panel must be loop checked and simulations conducted prior to delivery to site.	Sum	1	24 800,00	24 800,00
				CARRIED FORWARD R	19 945 200,00

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ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R c
			BROUGHT FORWARD R		[illegible]
26.3 26.3.1	**Delivery to site** Delivery of all equipment to site, offloading, rigging and installation, inclusive of all material and consumables, within the appropriate ground floor areas.	No	1	[illegible]	[illegible]
26.3.2	Protection of equipment during construction	Sum	1	[illegible]	[illegible]
26.4	**Site Acceptance Testing** Rigorously complete the Site Testing and Commissioning through all permutations of normal and starting conditions.				
26.4.1	Labour	Days	5	[illegible]	[illegible]
26.4.2	Disbursement	Days	5	[illegible]	[illegible]
26.5	**Training** Comprehensive, 1st line of support and operational training to CoCT personnel, inclusive of appropriate manuals and drawings				
26.5.1	Labour	Days	1	[illegible]	[illegible]
26.5.2	Disbursement Supplier to make adequate provision by stating the QTY and Rate	Days	1	[illegible]	[illegible]
26.6 26.6.1	**Maintenance & Guarantee** Maintenance for twelve [12] months of the DPFC	Sum	1	[illegible]	[illegible]
26.6.2	Cost of spares holding on site. Schedule of spares shall be provided as to what has been included under this heading.	Sum	1	[illegible]	[illegible]
26.7 26.7.1	**Transformers** With reference to the Detailed Specification, Manufacture, Factory Acceptance Testing, Supply, Storage of the following 5 MVA DPFC Step-Down Transformers (Refer to datasheets for transformer details)	No	1	[illegible]	[illegible]
26.7.2	Transportation, offload and placing in position of the above 5000 kVA Transformers on site	No	1	[illegible]	[illegible]
26.7.3	Full commissioning of the transformers on site, inclusive of testing and demonstrating the Buchholz, Temperature and Pressure Tripping functionality in conjunction with the MV Switchgear.	Sum	1	[illegible]	[illegible]
			CARRIED FORWARD R		[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
			BROUGHT FORWARD R		14 223 982,00
26.8	Allow for painting of the DPFC Room flooring with an industrial epoxy paint to City specification both before and after equipment installation	Sum	1	145 994,00	145 994,00
26.9	ADDITIONAL ITEMS Other items the tenderer may consider necessary to complete the installation				
26.9.1	1). DPFC Panels Extended warranty for 2nd year maintenance, PAT, supply, Surveys	Lot	1	125 000,00	125 000,00
26.9.2	2). 2 x 5 mVA DPFC Supplier Tenderers Transport, offloading and placing	Lot	1	198 700,00	198 700,00
26.9.3	3). Inspection of Work done and Tenderer Commissioning of Transformer on	Lot	1	15 000,00	15 000,00
26.9.4	4). Site (incl. bedding/dewatering etc Bucket, Temperature/pressure Tapping functionality in accordance with the IM Supplier DPFC Transformer No. 2	Lot	1	1 500,00	1 500,00
	TOTAL AMOUNT OF SCHEDULE NO. 26 CARRIED TO SUMMARY ON PAGE 327				14 523 774,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 27				
27.	**HEALTH AND SAFETY**				
27.1	Allow for all costs and expenses in connection with the following: -				
27.1.1	Compliance with the Health and Safety Specification in Volume 3A.	Sum	1	[illegible]	[illegible]
27.1.2	Compliance with the requirements of the Occupational Health and Safety Act, 85 of 1993 and Construction Regulations, 2014 (for Health and Safety Plan see seperate item).	Sum	1	[illegible]	[illegible]
27.1.3	Liaison, co-ordination and chairing of meetings in respect of Health and Safety requirements	Sum	1	[illegible]	[illegible]
27.1.4	Contractor's initial obligation in respect to the Occupational Health and Safety Act and Construction Regulations, including the preparation of a Health & Safety Plan	Sum	1	[illegible]	[illegible]
27.1.5	Provision of preparing a Hazard Identification and Risk Assessment (HIRA)	Sum	1	[illegible]	[illegible]
27.1.6	Provision for the development of a documented Plan of OH&S Method Statement and/or Safe Work Procedures	Sum	1	[illegible]	[illegible]
27.1.7	Provision for occupational health (Medicals – pre and post-employment; Physical and Psychological for work at elevated heights; Medical surveillance for hazardous work; Baseline & audiometric screening tests; HIV and AIDS Programme; etc.)	Sum	1	[illegible]	[illegible]
27.1.8	Provision for medical certificates of fitness, issued by a registered Occupational Health Practitioner, for all contractor's employees on site	Sum	1	[illegible]	[illegible]
27.1.9	Provision for protective equipment & protective clothing Provision for OH&S equipment	Sum	1	[illegible]	[illegible]
27.1.10	Provision for ensuring public health and safety	Sum	1	[illegible]	[illegible]
27.1.11	Provision for occupational health and safety signage, pictograms and notices	Sum	1	[illegible]	[illegible]
27.1.12	Provision of full time Construction Manager	Sum	1	[redacted]	[redacted]
27.1.13	Provision for a competent, part time Safety Officer who will carry out at least fortnightly safety audits of site	Sum	1	[illegible]	[illegible]
				CARRIED FORWARD R	[illegible]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	BROUGHT FORWARD R				516 440,00
27.1.14	Provisions for the implementation, Management and adherence of the OH&S plan	Sum	1	27 600,00	27 600,00
27.1.15	Provision for ensuring Contractor(s) compliance to statutory requirements, including monitoring and auditing of Contractor(s)	Sum	1	15 600,00	15 600,00
27.1.16	Provision for OH&S training, promotion and awareness	Sum	1	19 136,00	19 136,00
27.1.17	Other Health and Safety expenses incurred in complying with the requirements of the Contract not included above (Specify): -				
27.1.17.1	1)	Sum	1	-	-
27.1.17.2	2)	Sum	1	-	-
27.1.17.3	3)	Sum	1	-	-
27.1.17.4	4)	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 27 CARRIED TO SUMMARY ON PAGE 327				576 776,00

[redacted]

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 28				
28.	ENVIRONMENTAL MANAGEMENT				
28.1	Allow for all costs and expenses in connection with the following: -				
28.1.1	Compliance with the Environmental Management Specification in Volume 3A		1	46 000,00	46 000,00
28.2	Other Environmental Management expenses incurred in complying with the requirements of the Contract not included above (Specify):				
28.2.1	1)	Sum	1	-	-
28.2.2	2)	Sum	1	-	-
28.2.3	3)	Sum	1	-	-
28.2.4	4)	Sum	1	-	-
	TOTAL AMOUNT OF SCHEDULE NO. 28 CARRIED TO SUMMARY ON PAGE 327				46 000,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 29				
29.	MANAGEMENT AND INSPECTION				
29.1	Allow for all costs and expenses in connection with the following: -				
29.1.1	Management of Project programme		1	40 340,00	40 340,00
29.1.2	Management of Project Budget		1	40 340,00	40 340,00
29.1.3	Site Management: Overseeing Installation & Commissioning		1	275 000,00	275 000,00
29.1.4	Inspection of Local fabrication by sub-contractors		1	56 680,00	56 680,00
29.1.5	Management of monthly Progress Reports as per sub-clause 4.21			-	-
	TOTAL AMOUNT OF SCHEDULE NO. 29 CARRIED TO SUMMARY ON PAGE 327				416 760,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
	SCHEDULE NO. 30				
30.	SUNDRIES				
30.1	Allow for all costs and expenses in connection with the following: -				
30.1.1	Operation and Control system	Item	1	89 100,00	89 100,00
30.1.2	Providing "as built" drawings.	Item	1	63 250,00	63 250,00
30.1.3	Providing 2 draft copies of the Installation, Operation and Maintenance Manual prior to commissioning of the Works.	Item	1	43 725,00	43 725,00
30.1.4	Providing 6 final hard copies & 1 soft copy of the Installation, Operation and Maintenance Manual prior to the issue of the Taking -Over Certificate	Item	1	114 540,00	114 540,00
30.1.5	Operating Instructions and Signage, as specified	Item	1	37 490,00	37 490,00
30.1.6	Inspections, tests, etc. of equipment outside the Cape Metropolitan Area other than the contract Sites.	Item	1	117 200,00	117 200,00
30.1.7	Provision of all Test Certificates and Certificate of Compliance in terms of the Code of Practice for Wiring of Premises.	Item	1	14 100,00	14 100,00
30.1.8	Checking, starting up, testing and commissioning of the complete Works	Item	1	1 500 900,00	1 500 900,00
30.1.9	Operational and maintenance training. (Training over multiple shifts)	Item	1	169 625,00	169 625,00
30.1.10	Trial Operation Period obligations (Allow the costs for running the operations 24/7 for 28 days)	Item	1	1 227 910,00	1 227 910,00
30.1.11	Maintaining & Servicing the Aeration Blower Equipment during the Defects Notification Period.	Item	1	-	Incl
30.1.12	Maintaining & Servicing the DPFC Equipment during the Defects Notification Period.	Item	1	191 742,50	191 742,50
30.1.13	Maintaining & Servicing the Actuated valves, DO probes, mass flow meters Equipment during the Defects Notification Period.	Item	1	70 934,00	70 934,00
30.1.14	Maintaining & Servicing the various pumping Equipment during the Defects Notification Period.	Item	1	562 000,00	562 000,00
			CARRIED FORWARD	R	4 556 215,50

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
30.1.15	Maintaining & Servicing the Generator and Fuel Storage Equipment during the Defects Notification Period.	Item	1	-	incl
30.1.16	Maintaining & Servicing the FBDA Equipment during the Defects Notification Period.	Item	1	-	incl
30.1.17	Maintaining & Servicing the Submersible Agitator Equipment during the Defects Notification Period.	Item	1	-	incl
30.1.18	Maintaining & Servicing the Odour Control Equipment during the Defects Notification Period.	Item	1	-	incl
30.1.19	Provision for repeating and addressing the tag numbers on the SCADA and electrical cables.	Item	1	201 250,00	201 250,00
30.1.20	Provision for repeating and addressing the asset register values.	Item	1	100 625,00	100 625,00
30.1.21	Travelling to areas other than the Cape Metropolitan Area to inspect and conduct factory acceptance testing		1	40 940,00	40 940,00
30.1.22	Spares and Tools NOTE: The following items shall be adjusted in terms of Clause 13.8.2.1 in the Particular Conditions in C1.2 Contract Data, if applicable, specify				
30.1.22.1	1).....			-	-
30.1.22.2	2).....			-	-
30.1.22.3	3).....			-	-
30.1.22.4	4).....			-	-
	TOTAL AMOUNT OF SCHEDULE NO. 30 CARRIED TO SUMMARY ON PAGE 327				4 878 065,00

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	AMOUNT R c
	SUMMARY	
1	Total of Schedule 1 from page 233-233 General Requirements and Conditions	28 046 761,34
2	Total of Schedule 2 from page 234-236 Athlone Aeration Blowers and Associated Equipment	34 666 865,60
3	Total of Schedule 3 from page 237-238 Athlone Aeration Main Header Modifications	4 523 113,66
4	Total of Schedule 4 from page 239-240 Athlone Aeration Blowers HVAC	1 791 300,08
5	Total of Schedule 5 from page 241-242 Athlone Blower-House Gantry Crane	1 776 263,00
6	Total of Schedule 6 from page 243-245 Athlone RAS Pumps, Piping and Valves	10 636 745,43
7	Total of Schedule 7 from page 246-247 Athlone WAS Pumps, Piping and Valves	2 269 394,11
8	Total of Schedule 8 from page 248-249 Athlone A-Recycle Pumps, Piping and Valves	23 641 481,19
9	Total of Schedule 9 from page 250-251 Athlone Submersible Mixers	6 511 615,80
10	Total of Schedule 10 from page 252-253 Athlone Odour Control	1 625 180,90
11	Total of Schedule 11 from page 254-255 Athlone Aeration Network Modifications	3 211 514,91
12	Total of Schedule 12 from page 256-260 Athlone FBDA Equipment, Piping and Fittings: Materials and Equipment	6 729 507,00
13	Total of Schedule 13 from page 261-265 Athlone FBDA Equipment, Piping and Fittings: Preperation for Installation	3 680 676,50
14	Total of Schedule 14 from page 266-267 Athlone FBDA Equipment, Piping and Fittings: Installation, Commissioning, Upholding	1 678 413,40
15	Total of Schedule 15 from page 268-268 Athlone Electrical Works (P & G's)	405 870,00
16	Total of Schedule 16 from page 269-284 Athlone Electrical Works (LV MCC)	10 990 826,00
	CARRIED FORWARD R	146 065 458,10

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	AMOUNT R c
	SUMMARY	
17	Total of Schedule 17 from page 285-289 Athlone Electrical Works (Cabling and Terminations)	1 133 347,45
18	Total of Schedule 18 from page 290-292 Athlone Electrical Works (Cable Supports)	5 716 [illegible]00
19	Total of Schedule 19 from page 293-294 Athlone Electrical Works (Earthing and Bonding)	256 200,00
20	Total of Schedule 20 from page 295-297 Athlone Electrical Works (Civil Works)	4 166 445,57
21	Total of Schedule 21 from page 298-301 Athlone Electrical Works (Ancillary Equipment)	2 917 885,00
22	Total of Schedule 22 from page 302-305 Athlone Electrical Works (Instrumentation)	2 918 310,00
23	Total of Schedule 23 from page 306-309 Athlone Electrical Works (MV Switchgear and Transformers)	20 543 692,50
24	Total of Schedule 24 from page 310-310 Athlone Electrical Works (Busbar)	6 409 [illegible]8,32
25	Total of Schedule 25 from page 311-316 Athlone Electrical Works (Genset)	16 [illegible]53 913,18
26	Total of Schedule 26 from page 317-319 Athlone Electrical Works (DPFC equipment)	6 [illegible]27 [illegible]4,45
27	Total of Schedule 27 from page 320-321 Health and Safety	576 196,00
28	Total of Schedule 28 from page 322-322 Environmental Management	46 000,00
29	Total of Schedule 29 from page 323-323 Management and Inspection	968 760,00
30	Total of Schedule 30 from page 324-326 Sundries	4 678 053,50
	CARRIED FORWARD R	256 287 463,50

DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS

ITEM	DESCRIPTION	UNIT	QTY	PRICE R c	AMOUNT R c
				BROUGHT FORWARD R	236 267 458,90
	SCHEDULE 31				
	CONTINGENCIES				
	The following items will be deducted in part or whole if not required: -				
31.1	Allow the sum of 10% (ten percent) of the above total for contingencies to be spent as the Engineer may direct.	Item	1	10%	23 629 145,91
31.2	Allow for any additional Cost and profit required per day in the event of access to, and possession of, the Site not being available as per Sub-Clause 2.1(b) of the Conditions of Contract.	Days	35	-	No cost for 35 days
31.3	Allow for any additional Cost and profit required per day in the event of a delay in the testing and commissioning at Site and the resultant delay in the commencement of the Defects Notification Period from causes not attributable to the Contractor, as per Sub-Clause 10.3 (b) of the Conditions of Contract.	Days	35	-	No cost for 35 days
31.4	Allow for all costs and expenses in leaving Site and returning at a later date due to causes not attributable to the Contractor.	Item	1	-	25 000,00
				Total excluding VAT R	259 944 231,79
				Add 15% for Value Added Tax R	38 991 634,77
				Carried to Part C1.1 Form of Offer and Acceptance R	298 935 473,44

DECLARATION (in respect of completeness of Tender)

City of Cape Town
Tower Block, Civic Centre
12 Hertzog Boulevard
CAPE TOWN

I/ we, the undersigned, do hereby declare that these are the properly priced Schedules of Quantities forming Part C2.2 of the Contract Document which contains 97 pages numbered 231 to 328 in consecutive order in Volume 3 and the number of pages in consecutive order in Volume 3A as stated on page i thereof, upon which my/our tender for **TENDER NO. 376Q/2018/11 DESIGN – BUILD OF MECHANICAL AND ELECTRICAL WORKS FOR THE REFURBISHMENT OF THE C-WORKS AT THE ATHLONE WASTEWATER TREATMENT WORKS** has been based. If I/we have submitted a printed version of the Schedules of Quantities, I/we warrant that no amendments have been made to it from the original, other than amendments issued in any Addenda in terms of Clause F.3.2 in Part T1.2 Tender Data.

SIGNED ON BEHALF OF TENDERER: [redacted]

DATE: 24-07-2019

[redacted]

PART C3: SCOPE OF WORK

C3.1 Description of the Works

C3.2 Engineering

C3.3 Procurement

C3.4 Construction

C3.5 Management

C3.6 Annexes (see Volume 3A)

Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, particular specification or any drawings, the order of precedence, unless otherwise specified, is:

Drawings
Scope of Work (Parts C3.1, C3.4, C3.5 and C3.6)

Particular Specifications
SANS Standardised Specifications

C3.1: Description of the Works

CONTENTS

3.1.1 EMPLOYER'S OBJECTIVES
3.1.2 OVERVIEW OF THE WORKS
3.1.3 EXTENT OF THE WORKS
3.1.4 LOCATION OF THE WORKS
3.1.5 TEMPORARY WORKS

3.1.1 EMPLOYER'S OBJECTIVES

The Water and Sanitation: Wastewater branch of the City of Cape Town proposes to install new Mechanical Equipment and associated electrical works for the Athlone WWTW's as outlined below.

3.1.2 OVERVIEW OF THE WORKS

The Works are for the design – build, i.e. design, supply, delivery, installation, testing, commissioning and upholding during the Trial Operation Period and the Defects Notification Period, of the following items at the Athlone wastewater treatment works:

Blowers

The aeration zones of the six parallel reactors receive air from the blower house which houses four blowers. Only two blowers are in operation and the remaining two are inoperable. The two blowers have sufficient capacity to meet the requirements of the plant but are susceptible to frequent breakdowns as they are over thirty years old and are in a poor condition. The risk of an interruption of the air supply to the reactors is high and would negatively affect the overall quality of the final effluent. The lack of redundancy further increases the risk of the WWTW not meeting the regulatory requirements. The blower house infrastructure is in a poor condition with ancillary equipment (fans, cooling circuits, filters etc) displaying symptoms of mechanical fatigue

The existing blowers shall be replaced with four new single stage centrifugal blowers complete with integral gearboxes, automatic inlet guide vanes and variable vane diffusers. There will be three duty blowers and one standby blower. The new installation will have enough capacity to serve both the existing C-works and the new D-works via a new common discharge header splitting to each works' reactors. To accommodate the phased future D-works, the header will be installed with a flanged tee-piece for later connection. The construction of a new blower house and air supply piping will permit the existing aeration blowers to continue operation whilst the new equipment is being installed, yielding the least disruption to the aeration existing C-works.

Aside from replacement of the blowers themselves, new electrical infrastructure encompassing dynamic power factor correction (DPFC), transformers, a Motor Control Centre (MCC), diesel generator and fuel storage will be installed. A new air manifold shall be provided from the blowers to the existing reactor distribution piping, complete with tie-in points for a future reconfigured air network.

Fine Bubble Diffused Aeration System

The existing fine bubble diffused aeration (FBDA) system was supplied and installed in 2002 by S.A.M.E Water. To date the system has been in operation for 16 years. Air is supplied by two Bryan Donkin SD 66.5 centrifugal blowers and a stainless-steel header distributes it to the aeration zone consisting of six reactors. Membrane disc diffusers type (NOPOL®PIK 300) are mounted on a network of uPVC lateral pipes secured to the reactor floor, which are fed from stainless steel headers and drop legs connecting back to the discharge of the aeration blowers. The diffusers break the air up into fine bubbles, resulting in a larger surface area over which oxygen transfer can occur and thus improving the final effluent quality.

The existing FBDA system shall be replaced with new efficient and optimised diffusers designed to meet the process requirements.

Submersible Mixers

The Athlone WWTW consists of six parallel biological nutrient removal reactors which are divided into three compartments (i.e. anaerobic, anoxic and aerobic). The anaerobic and anoxic compartments of each reactor are equipped with six submerged mixers, with a total number of 36 mixers installed for the 6 (six) reactors. The mixers continuously stir the content of the reactors to ensure that a consistent homogenous liquor is maintained within the reactors. The mixers have been in operation for 15 years and experience frequent breakdowns.

All 36 mixers shall be replaced with new efficient submersible mixers of the same capacities. Replace existing Davit arms and lifting mechanisms.

Return Activated Sludge (RAS) Pumps

There are four duty and two standby return activated sludge (RAS) pumps currently serving the C-works. Three of the pumps are housed in East Recycle Pump Station which transfer settled sludge from eight 35 m diameter SSTs and the other three are housed in West Recycle Pump Station returning sludge from twelve 23.5 m diameter SSTs. The 35m diameter SSTs and associated pumps are the newer of the two systems and were installed in 2003. The RAS pumps housed in the West Pump Station have been in operation for over +/-30 years and not likely to run for the next 10 years.

A review of the existing process capacity was conducted, and the outcome revealed that the process is not optimally to produce the desired outcome. The revised total RAS flowrate has substantially increased to satisfy revised process requirements. Six new pumps with the required capacities shall be installed to replace the existing pumps housed in the East and West Recycle Pump Stations.

A-Recycle Pumps

There C-works' A-recycle is currently made up of three duty pumps and one standby pump. These pumps are housed in West Recycle Pump Station. These pumps were installed at the same time with the RAS recycle pumps house in the West Recycle Pump Station. The A-recycle pumps have been in operation for +/- 30 years and are likely not to run for the next 10 years.

The revised projected A-recycle flow has significantly changed rendering the existing pumps incapable of satisfying the process conditions. The existing pumps will be replaced with 12 axial flow pumps (one duty and one standby per reactor). Each reactor will have a dedicated duty and standby pump to transfer mixed liquor from the aeration zone to the anoxic zone.

Waste Activated Sludge (WAS) pumps

The City of Cape Town has concluded that it will continue to pump sludge from Athlone WWTW to Cape Flats WWTW Instead of dewatering it on site. This renders the DAF facility redundant as thickening is not required anymore. Since no thickening is required on site, it is proposed that the WAS from the reactors be routed directly to the DAF's sludge sump, where it can then be pumped to sewer

The existing WAS pumps are progressive cavity pumps design for pumping sludge. Since thickening is not required anymore, these pumps are not suitable for this purpose as the WAS will be thinner due to the fact that it is not thickened.

The existing WAS pumps shall be replaced with three new centrifugal pumps (two duty and one standby). These pumps will be used to draw suction from the existing WAS pumps and transfer it to the sewer.

Odour control system

The Athlone WWTW has three dedicated odour control systems strategically positioned at various locations to capture and treat odorous sewage off-gases, an example being hydrogen sulphide (H2S) which is generated from the works. The type of system and locations are as follows:

- A bio-trickling filter installed to treat the odours from the C-inlet Works and 3 PSTs;
- A biological modular biofilter installed to treat the off-gases from the sludge holding tank and dewatering plant;
- A bio trickling filter installed to treat odours from the remaining 3 PST's

Since the dewatering plant is not in operation, no work will be carried out on the odour control unit serving this system. Work will be carried out on the odour control systems serving the C-inlet work, 3 PSTs and the odour control system serving the remaining 3 PSTs.

Inlet Works and 3 PSTs Odour Control System

New inlet works will be built complete with an odour control system as part of the proposed D-Works extension. As a result, it is envisaged that the existing inlet works will be demolished. Due to the extended programme and timelines, the existing odour control shall be refurbished to continue servicing the existing inlet works and the three PSTs in the interim. The following equipment shall be considered for refurbishment:

- Replace recirculation pumps.

- Biotrickling filter media irrigation pump is not delivering the required flow rate. This pump should be repaired.
- The media is guaranteed for a 10-year period, the system has been in operation for 9 years, the media shall be replenished.
- Fan performance (flow and pressure) must be verified to ensure correct foul air extraction rates and biotrickling filter retention times are maintained
- The motor of the nutrient tank mixer is corroded and should be replaced

Plant Primary settling tank odour control system

The odour control system serving the PSTs is operational but has proven to be inefficient and unreliable. This system will continue to service the PSTs and it is therefore shall be refurbished to improve its operability and efficiency. The following equipment shall be considered for refurbishment:

- Replace recirculation pumps.
- Nutrient mixer motor is poorly corroded and may fail at any time, therefore the motor shall be replaced.
- Fan performance (flow and pressure) must be verified to ensure correct foul air extraction rates and biotrickling filter retention times are maintained
- The motor of the nutrient tank mixer is corroded and should be replaced

3.1.3 EXTENT OF THE WORKS

The scope of this Contract includes the design, supply, installation, testing, commissioning and upholding during the operational acceptance period and the maintenance period for the following: -

i) New blower equipment mounted on plinths in the new blower-house, incorporating inlet air filters and silencers, centrifugal blowers driven by a gearbox and motor, gearbox lubricant circuits with appropriate cooling, inlet guide vanes (IGV's), variable vane diffusers (VVD's), inlet and outlet vibration dampers, discharge cone diffusers incorporating silencers, blow-off valves with associated piping and silencers, ventilated acoustic enclosures and all instrumentation and controls necessary for the safe and efficient running of the blowers. The number of blowers for the defined capacity are to be confirmed by the Contractor.

ii) Sub-header piping downstream of each blower cone diffuser and blow-off, complete with in-line silencer, non-return valve, isolation valve and acoustic lagging up to in-line silencer.

iii) New ducting from each new blower acoustic enclosure, to remove heat to outside.

iv) A new aeration distribution piping network to extend from each aeration blower sub-header via a new main 1200mm NB header to tie-in to the existing C-Works plant pipework and in addition to provide a blank flange for the future D-Works plant pipework. The new piping is to include the necessary airflow measurement as well as main air header pressure and temperature measurement utilising electronic as well as analogue gauges. These installations shall require the instruments as described in this tender document, complete with all cabling and racking.

v) New aeration piping for the existing C-works piping; this is subject to a site assessment once the contract is awarded.

vi) New inlet acoustic louvres introduced in the blower-house external wall at high level.

vii) New acoustic inlet louvres, fitted into apertures in the wall of the plenum chamber to allow air to flow from the plenum into the new blower room.

viii) New filter frames and ducting complete with primary filtration and pressure differential indication in the purpose-built filter room area of the new blower-house

ix) New weather-proof/bird proof standard louvres fitted into the outside wall high level apertures on the opposite side of the building to the inlet louvres to allow airflow through the blower house for ventilation purposes.

x) Oil coolers for the blowers, to be located outside of the blower house within weatherproof, acoustic enclosures to provide forced convective cooling to the blower gearbox oil.

xi) HVAC fans to introduce air into the blower house and provide a positively pressurized environment.

xii) New appropriately spanned and sized Condra double girder electric overhead travelling crane complete with power supply; road transport to site; hooks; rail to roof truss; floor to rail and supports. The crane should be sized to lift the various components of the aeration blower equipment.

xiii) The FBDA network servicing the C-works reactors shall be replaced (subject to inspection) along with its associated equipment; including knife gate valves, piping, droplegs and instrumentation to efficiently operate the new blowers.

xiv) The submersible mixers shall be replaced with new mixers; the davit arms and lifting mechanisms shall be reused.

[redacted]

xv) The existing 6 x RAS pumps shall be removed and replaced with upgraded pumps, associated piping and valves. The new pumps shall be sized for the new upgraded process requirements.
xvi) The existing WAS progressive cavity pumps are no longer required and shall be replaced with three new centrifugal pumps and all other associated equipment.
xvii) The odour control system at the inlet works and 3 PSTs shall be refurbished.
xviii) The odour control system serving the PSTs shall be refurbished.
xix) New electrical distribution boards and Motor Control Centre (MCC). The MCC shall supply power to the new blowers as well as the remainder of the existing & planned reactor infrastructure, ultimately replacing the MCC in the old MCC room.
xx) New Dynamic Power Factor Correction (DPFC) equipment and associated DPFC and power transformers.
xxi) Forced air ventilation in the power transformer rooms and air conditioning in the DPFC room to manage the heat generation accordingly.
xxii) New Diesel Generator complete with fuel storage and associated controls.
xxiii) All bus-bar and supports, power and control cabling, cable racking utilising the purpose-built cable trenches.
xxiv) Removal of the redundant blower equipment, piping & fittings, electrical panels and cabling as well as the existing standby generator and fuel storage system.

All work (including construction and defects notification period) must be programmed to be completed within these 1415 days period. As this project will exceed the current budget cycle, it is subject to Section 33 of the Municipal Finance Management Act, 56 of 2003, and consequently the Employer must follow the required processes in terms of Section 33. These will run concurrently with the procurement process for this tender/contract.

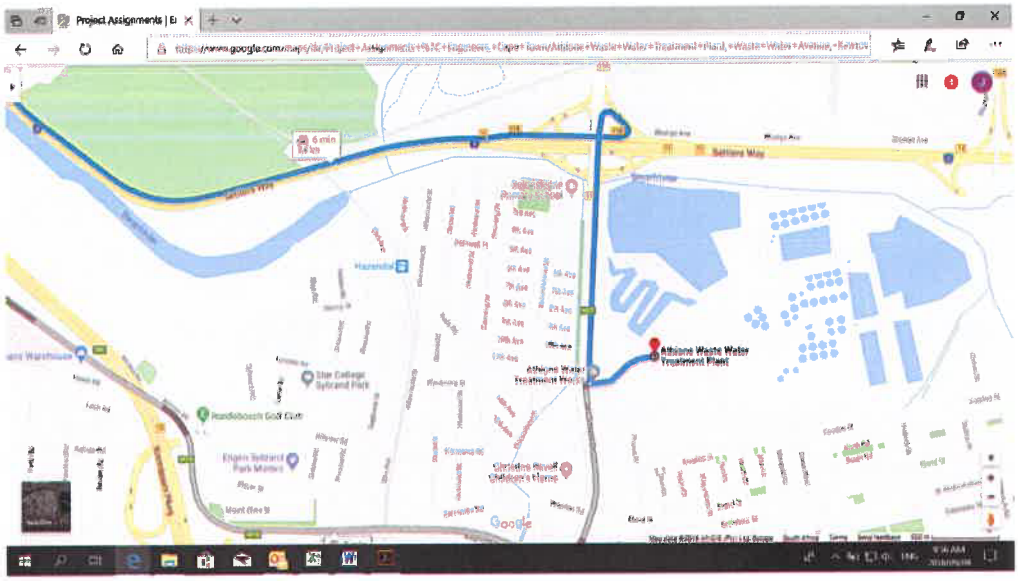
[redacted]

3.1.4 LOCATION OF THE WORKS

Athlone Wastewater Treatment Works

The Athlone Wastewater Treatment Works can be reached by travelling east on the N2, turning south at Jan Smuts Drive (M17). After 1 km turn left into the Athlone Wastewater Works.

GPS Co-ordinates : 33°57'22"S 18°30'30"E



GPS Co-ordinates: 33°57'22"S 18°30'30"E

3.1.5 TEMPORARY WORKS

The temporary works relevant to this contract include:

- Structures set up as part of the Contractors site establishment i. e. offices, canteen, ablution facilities. This will be located within the Athlone WWTW at a location approved by the Employer.
- Scaffolding required to install oil coolers, piping, louvres, ducting or to perform any other work required at height.

The above-mentioned temporary works shall be removed offsite by the Contractor once the final taking over certificate has been issued.

[redacted]

Part C3.2 Engineering

CONTENTS

3.2.1 DESIGN SERVICES AND ACTIVITY MATRIX
3.2.2 EMPLOYER'S DESIGN
3.2.3 DESIGN BRIEF
3.2.4 DRAWINGS
3.2.5 DESIGN PROCEDURES

3.2.1 DESIGN SERVICES AND ACTIVITY MATRIX

Design Stage	Responsibility
Concept, feasibility and overall process	Employer/Employer's Agent
Preliminary design and basic engineering for tendering purposes	Employer/Employer's Agent
Detail design for construction	Contractor
Approval of detail design for construction	Employer/Employer's Agent
Provision of as-build drawings, operation manuals, control philosophies, Functional Design Specifications	Contractor

3.2.2 EMPLOYER'S DESIGN

See section A, B and C in Volume 3A

3.2.3 DESIGN BRIEF

See section A and B in Volume 3A

3.2.4 DRAWINGS

The following drawings are applicable to the contract and are issued with this tender document and will form part of the Contract Documents as **Volume 4**.

DRAWING NUMBER	DESCRIPTION
W1792-41008-02	PFD C-Works Biological Nutrient Removal (New/ Modified Equip)
W1792-41009-01	PFD New East and West RAS Pumps
W1792-41010-02	PFD C-Works Dissolved Air Flotation (New/ Modified Equip)
W1792-41011-00	PFD Aeration Blowers
W1792-45001-01	P&ID New Blower House Equipment
W1792-45002-01	P&ID New Aeration Network
W1792-45003-01	P&ID New East and West RAS Pumps
W1792-45004-01	P&ID New WAS Transfer Pumps
W1792-45005-00	Athlone WWTW New Blower House Diesel Fuel System P&ID
W1792-45006-00	P&ID PSTs Odour Control and Nutrient Dosing-A1
W1792-57001-02	Typical Field E-Stop/ Isolator Stand
W1792-57002-01	Typical Analyser Enclosure
W1792-64002-02	Existing PLC Network Diagram
W1792-69001-03	Communication Network Diagram
W1792-85001-05	C-Works Piping and Equipment GA Plan View
W1792-85002-Sh1-03	New Aeration Blower Building Plan Layout
W1792-85002-Sh2-00	New Aeration Blower Building Sections and Elevations

W1792-57002-01	Typical Analyser Enclosure
W1792-64002-02	Existing PLC Network Diagram
W1792-69001-03	Communication Network Diagram
W1792-85003-02	Aeration Piping Layout
W1792-85004-02	Reactor Basin Layout and Details
W1792-94002-03	DAF Panel MCC Single Line Diagram
W1792-94003-03	Mixer Panel MCC Single Line Diagram
W1792-94005-02	East Pump station MCC Single Line Diagram
W1792-94007-09	Proposed MV Single Line Diagram
W1792-94008-01	West Pump Station MCC Single Line Diagram
W1792-94009-01	Typical DOL Motor Starter Schematic
W1792-94010-01	Typical VSD Motor Starter Schematic
W1792-94011-01	Typical Forward Reverse Motor Starter Schematic
W1792-94012-03	LVDB Single Line Diagram
W1792-94015-03	MV Room Distribution Board Single Line Diagram
W1792-94016-01	Typical Soft Starter Motor Schematic
W1792-95001-02	CCTV Site Layout
W1792-95002-02	Street Lighting Site Layout
W1792-96001-01	DAF General Arrangement
W1792-96004-03	2 Mixer MCC General Arrangement
W1792-97001-03	MV Substation Equipment Layout
W1792-98005-01	Street Lighting Lollipop Diagram
W1792-98006-01	Street Lighting Lollipop
W1792-47002-03	Equipment List
W1792-61001-03	Instrument List
W1792-61002-02	Control Valve List

It should be noted the drawings listed above reflect the preliminary design status as prepared by the Engineer. It is the Contractor's responsibility to develop the design more fully to detailed design status. However, the drawings listed are intended to provide input into a clearer understanding of the project and its scope.

3.2.5 DESIGN PROCEDURES

The requirements relating to the information and drawings to be submitted by the Contractor for approval by the Engineer prior to the purchase and manufacture of any plant and equipment must be read together with Clause 5 of the General Conditions.
All the documents listed below shall be submitted for approval by the Engineer.

3.2.5.1 General Requirements

The Contractor's Documents shall comply with the following general requirements:

a) Three copies of all documents shall be submitted.

b) A register of all the Contractor's documents shall be provided with each submission.

c) Drawings shall be prepared in accordance with the latest issue of SANS 10111. An equivalent international code of engineering drawing practice will also be acceptable.

d) General Arrangement drawings shall be to A1 or AO size.

e) Drawings shall be to scale, with both the scale and the drawing being large enough to clearly show all relevant components of the plant and equipment.

f) In addition to the usual plan and two side elevations, sufficient additional sections shall be included to clearly show the arrangement of all plant and equipment.

g) Item lists shall be provided on the drawing or on a separate parts list.

h) Item descriptions shall include the material of construction, quantity and full identification information, including, as applicable, brand name, manufacturer's reference number, model number, size, rating, source, duty, quantity, etc.

3.2.5.2 Required Submissions within 42 days

The Contractor shall submit the following for acceptance within 42 days from the Commencement Date:

a) Dimensioned layout drawings (preferably A0 size but no smaller than A1) of the installation showing the proposed layout and design of all plant and equipment as well as any required building modifications. Sufficient sections and elevations must be shown so that the relative arrangement of all equipment is clear.

b) Process flow diagram, indicating items of equipment.

c) Control system specifications and control philosophy

d) Piping and instrumentation diagram showing the extraction ducting and treatment system

e) Dimensioned arrangement drawings of all electrical and mechanical equipment requirements in respect of the building and civil structures.

f) Drawings of pipe support details.

g) Process schedules: equipment, instruments, on/off valves, control valves and pressure safety valves, as applicable, giving key attributes for each item.

h) Layout and construction drawings of all electrical distribution, starter, control, instrument and indicator panels with full details of proposed switchgear, relays, timers, instruments, indicators, trips, control switches, labelling (including wording), printing, and so forth.

i) Mechanical equipment data sheets giving performance, sizing, physical and general technical data for all components of the installation.

j) Electrical Single Line Diagrams.

k) Electrical equipment datasheets: motor control centre, switchgear, PLC.

l) Electrical panel layouts.

m) Power and control cable routings.

n) Earthing drawings.

o) Loop diagrams.

p) Instrument datasheets.

q) Small power and lighting layout.

r) Contents list for the Manual.

s) Contractor's document registers.

t) Hazard and Operability report following outcome of formal HAZOP Study.

The date by which possession of the Site can be handed over to the Contractor and consequently the completion date of the Works, is dependent on the date of submission and acceptance of the documents referred to above. Cost resulting from delays in submission of the Contractor's Documents or in correcting errors or making changes on documents not approved by the Engineer shall be for the

[redacted]

Contractor's account.

The item allowed for in the Schedules of Quantities to cover expenses incurred by the Contractor in the event of delays in handing over the Site shall not apply where such delay is attributable to the late submission and acceptance of the drawings referred to above.

3.2.5.3 Required Submissions within 70 days

The Contractor shall submit the following for acceptance within 70 days from the Commencement Date:

a) Final process schedules, including instrument list and equipment list including, as a minimum, the make, model, capacity and any set points of units to be installed.

b) Cable schedule for power, data, control and instrumentation cables. This shall include the cable type and construction, conductor material, insulation, protection, voltage rating, start and finish points, route length, duty, load, voltage drop, core area, no. of cores, no. of cores used and gland size. For cable voltages above 400 Volts, the schedule shall also include the purchase details, specification and date of manufacture.

c) Contractor's updated drawing and document register.

d) Final piping and instrumentation diagrams.

e) Final process flow diagrams.

f) Final equipment, piping and ducting general arrangement and layout drawings.

g) Final equipment datasheets.

h) Electrical Single Line Diagrams.

i) Electrical equipment datasheets: motor control centre, switchgear, PLC.

j) Electrical panel layouts.

k) Power and control cable routings.

l) Earthing drawings.

m) Loop diagrams.

n) Instrument datasheets.

o) Small power and lighting layout.

3.2.5.4 Required Submissions before Commissioning the Works

Prior to commencement of the Tests on Completion and the start of the 28-day Trial Operation Period, the Contractor shall submit two copies of the Manual as specified in the Standard Specification for Mechanical Works in Volume 3A.

3.2.5.5 Before Taking-Over Certificate

Before the Taking-Over Certificate is issued, the Contractor shall provide six copies of the final version of the Installation, Operation and Maintenance Manual and shall also provide, on electronic data storage, all drawings supplied in terms of the Required Submissions within the time stated above, corrected where necessary to be "as built". The drawings shall be configured for AutoCAD, or equivalent. The Manual shall comply with the Standard Specification for Mechanical Works in Volume 3A.

Part C3.3 Procurement

CONTENTS

3.3.1 PREFERENTIAL PROCUREMENT
3.3.2 SUB-CONTRACTING PROCEDURES

3.3.1. PREFERENTIAL PROCUREMENT

The Works shall be executed in accordance with the conditions associated with the granting of preferences detailed in the **Preference Schedule** where preferences are granted in respect of B-BBEE contribution.

Financial penalties, as described in the **Preference Schedule**, shall be applied in the event that the Contractor is found to have breached and of the conditions contained in the **Preference Schedule** (unless proven to be beyond the control of the Contractor).

Notwithstanding the application of penalties, the Contractor's attention is drawn to other sanctions that may be applied by the Employer (listed in the **Preference Schedule**) with due consideration to the circumstances.

3.3.2. SUB-CONTRACTING PROCEDURES

3.3.2.1 Monitoring the use of sub-contractors

Notwithstanding the restriction on sub-contracting as described on the **Preference Schedule**, it is recognised that sub-contracting is an integral part of construction, which the conditions of contract make provision for.

In order, however, to comply with the requirements of the **Preference Schedule**, the Contractor shall submit to the Employer's Agent, on a monthly basis, a **B-BBEE Sub-Contract Expenditure Report**. The format of this report is provided in Annex 2 attached.

The Contractor shall submit to the Employer's Agent documentary evidence in accordance with the applicable codes of good practise, of the B-BBEE status level of every sub-contractor employed by the Contractor. Until such time as documentary evidence as described above has been submitted to the Employer's Agent, a sub-contractor shall be deemed to be a non-compliant contributor.

The Contractor shall furthermore, on the written request of the Employer's Agent, provide documentary evidence showing the value of work sub-contracted to any or all of the sub-contractors employed by the Contractor.

3.3.2.2 Procedure for the selection of sub-contractors/suppliers

Where monetary allowances for provisional sums or prime costs items have been provided in the Bills of Quantities, and where the work or items to which the allowances relate are to be executed/supplied by sub-contractors/suppliers, then the following selection process shall be followed in respect of the required sub-contractors/suppliers:

Where the monetary allowance is less than or equal to R200 000, the Contractor shall invite three quotations from suitably qualified sub-contractors/suppliers for the required work or items. The selection of the three sub-contractors/suppliers shall be in consultation with, and to the approval of the Employer's Agent. The evaluation of the quotations received must include a preference points system as described in F.3.11 of the Tender Data.

Where the monetary allowance is in excess of R200 000, an open competitive tender process shall be followed in respect of the selection of a sub-contractor/supplier for the required work or items. In such circumstances, tender documentation will be prepared by the Employer's Agent in consultation with and to the approval of the Contractor, invitations to tender will be advertised in the media by the Employer's Agent on behalf of the Contractor, and a sub-contractor/supplier will be selected from the responses received, by the Contractor and Employer's Agent in consultation. The evaluation of the offers received must include a preference points system as described in F.3.11 of the Tender Data. The Contractor must satisfy itself that the selected sub-contractor/supplier can meet the requirements of the sub-contract /supply agreement and may, on reasonable grounds, elect not to employ a particular sub-contractor/supplier.

In both instances above (less than or equal to R200 000 or in excess of R200 000), the contractual relationship between the Contractor and sub-contractor/supplier shall be as described in the conditions of contract.

Part C3.4 Construction

CONTENTS

3.4.1 APPLICABLE STANDARDISED SPECIFICATIONS
3.4.2 PARTICULAR / PROJECT SPECIFIC SPECIFICATIONS
3.4.3 WAYLEAVES, PERMISSIONS AND PERMITS
3.4.4 LOCAL PRODUCTION AND CONTENT
3.4.5 EMPLOYMENT OF SECURITY PERSONNEL
3.4.6 UNIVERSAL ACCESS

3.4.1. APPLICABLE STANDARDISED SPECIFICATIONS

Standard specification for mechanical works (including general works) is included in Volume 3A.

Standard specification for electrical works (including general works) is included in Volume 3A.

Standard specification for electronic works (including general works) is included in Volume 3A.

3.4.2 PARTICULAR / PROJECT SPECIFIC SPECIFICATIONS

Detailed mechanical specification (including general works) is included in Volume 3A.

Detailed electrical specification (including general works) is included in Volume 3A.

Detailed electronic specification (including general works) is included in Volume 3A.

Particular Specification H: Environmental Management Specification and its Annexures are included in Volume 3A

Particular Specification G: Health and Safety Specification is included in Volume 3A.

3.4.3. WAYLEAVES, PERMISSIONS AND PERMITS

The Contractor shall be responsible for obtaining all of the necessary wayleaves, permissions or permits applicable to working near any existing services or other infrastructure on Site, and shall ensure that any wayleaves, permissions or permits obtained by the Employer's Agent prior to the award of the contract are transferred into the Contractor's name.

The Contractor shall abide by any conditions imposed by such wayleaves, permissions or permits.

The Contractor shall ensure that all wayleaves, permissions and permits are kept on site and are available for inspection by the relevant service authorities on demand.

The Contractor shall also ensure that any wayleaves in respect of electricity services are renewed timeously every three months.

3.4.4. LOCAL PRODUCTION AND CONTENT

The Contractor will be required to comply with all requirements as stated in this document.

3.4.5 EMPLOYMENT OF SECURITY PERSONNEL

All security staff employed by the contractor on behalf of the CCT or at any CCT property must be registered with Private Security Industry Regulatory Authority (PSiRA). Proof of such registration must be made available to the employer's agent upon request.

3.4.6 UNIVERSAL ACCESS

In pursuit of becoming a fully accessible city, the City of Cape Town expects all Consultants and Service Providers to design and construct to SANS Standards for accessible Design, and any relevant City of Cape Town documents as may be relevant, and to exhibit a commitment to employing Universal Design Principles in their design, construction, service and product delivery of construction projects. This applies to all projects whether new, temporary, upgrades or rehabilitation works.

The contractor will engage with project representatives and the CCT's Universal Accessibility Department on how Universal Design Principles will enhance accessibility, within this project, that meets a variety of needs and creates a city that is accessible to everyone.

C3.5 Management

CONTENTS

3.5.1. FORMS FOR CONTRACT ADMINISTRATION
3.5.2 PARTICIPATION OF TARGETED LABOUR
3.5.3. COMMUNITY LIAISON OFFICER
3.5.4. PARTICIPATION OF TARGETED ENTERPRISES
3.5.5. ENVIRONMENTAL MANAGEMENT PROGRAMME
3.5.6. HEALTH AND SAFETY

3.5.1. FORMS FOR CONTRACT ADMINISTRATION

The Contractor shall complete, sign and submit with each monthly statement for payment, the following updated returns (the format of which are attached in C3.6 Annexes as amended from time to time):

a) Monthly Project Labour Report (Annex 1)
b) B-BBEE Sub-Contract Expenditure Report (Annex 2)
c) Joint Venture Expenditure Report (Annex 3)
d) Targeted Labour Contract Participation Expenditure Report (Annex 4)
e) Targeted Enterprises Contract Participation Expenditure Report (Annex 5)

The Monthly Project Labour Report must include details of all labour (including that of sub-contractors) that are South African citizens earning less than R350.00 per day, as adjusted from time to time (excluding any benefits), who are employed on a temporary or contract basis on this contract in the month in question.

In addition to the Monthly Project Labour Report the Contractor shall simultaneously furnish the Employer's Agent with copies of the signed employment contracts entered into with such labour, together with certified copies of identification documents as well as evidence of payments to such labour in the form of copies of payslips or payroll runs. If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it and proof of such acknowledgement shall be furnished to the Employer's Agent.

The Monthly Project Labour Reports shall be completed and submitted in accordance with the instructions therein and copies of all submitted documents must be kept on site be made available to the employer's agent upon request.

The **B-BBEE Sub-Contract Expenditure Report** is required for monitoring the prime contactor's compliance with the sub-contracting conditions of the **Preference Schedule**.

The Joint Venture Expenditure Report is required for monitoring the joint venture's compliance with the percentage contributions of the JV partners as tendered, where the joint venture has been awarded preference points in respect of its consolidated B-BBEE scorecard.

The Targeted Labour Contract Participation Expenditure Report (if applicable) is required for monitoring the contractor's compliance for achieving the specified minimum targeted labour contract participation goal (CPG_L) and, if applicable, for calculating any penalty in terms thereof.

The Targeted Enterprises Contract Participation Expenditure Report (if applicable) is required for monitoring the contractor's compliance for achieving the specified minimum targeted enterprises contract participation goal (CPG_E) and, if applicable, for calculating any penalty in terms thereof.

The Expenditure Reports shall be verified by the Employer's Agent/Employer's Agent's Representative.

In respect of Annexes 2 and 3, the Employer shall, in addition to any other sanctions available to it , apply the financial penalties applicable to breach of preferencing conditions in the **Preference Schedule** Preference Schedule in Part T2.2 Returnable Schedules. In the case of joint ventures (Annex 3), the contractor shall prove his compliance with item 6) in Section 2 of the Preference Schedule by providing a consolidated scorecard at his own cost on instruction from the Employer's Agent.

3.5.2 PARTICIPATION OF TARGETED LABOUR

3.5.2.1 Minimum targeted labour contract participation goal

In support of the National Department of Public Works' Expanded Public Works Programme which is aimed at alleviating poverty through the creation of temporary employment opportunities using labour intensive methodologies and practices where possible, the Employer is seeking to increase the intensity of labour, as appropriate, in all of its infrastructure sector projects.

It is a requirement of this contract, therefore, that the work be executed in such a manner so as to maximise the use of labour-intensive construction methods in order to provide low and semi-skilled temporary employment opportunities.

To this end, a minimum targeted labour contract participation goal is specified below, which shall be achieved by the Contractor in the performance of the contract, failing which, penalties as described will be applied. The Contractor is required to provide all skills training where necessary, so as to ensure that a minimum level of competence is achieved and maintained, such that the various activities are carried out safely and to the required standard. The cost of training shall be included in the rates for the various work activities.

The specified minimum targeted labour contract participation goal (CPG_L) is | 0 % |

The minimum CPG_L is such that the Contractor will have to carry out some of the work that would normally have been undertaken using mechanised construction methods, by using labour intensive construction methods instead. It is left to the discretion of the Contractor to identify suitable work activities for the intensification of labour. The Contractor shall, within 5 working days of being requested in writing by the Employer's Agent to do so, submit details of his/her plan to achieve the minimum CPG_L.

3.5.2.2 Definitions

For the purposes of the requirements in respect of the participation of targeted labour, the following definitions shall apply:

"Target area" means the all geographical areas within the city of Cape Town metropolitan area.

"Targeted labour contract participation goal (CPG_L)" means the sum of the wages (excluding any benefits), for which the Contractor, or any of his/her sub-contractors contracts targeted labour in the performance of the contract, expressed as a percentage of the value of the contract.

"Targeted labour" means low and semi-skilled individuals, whose wages (excluding any benefits) do not exceed the threshold value, who reside in the target area, that are employed by the Contractor, or any of his/her sub-contractors, in the performance of the contract.

"Threshold value" is R350.00 per day as adjusted from time to time (excluding any benefits). The threshold value is not to be confused with any industry sector minimum wage determined in accordance with the Basic Conditions of Employment Act, 75 of 1977.

"Value of the contract" means the contract sum (accepted contract amount) less provisional sums, contingencies and VAT.

3.5.2.3 The selection and recruitment of targeted labour

Where targeted labour is to be drawn from specific local communities (defined in terms of the target area), such labour shall be identified using the relevant Sub-Council Job-Seekers Database. The Contractor shall request, via a Community Liaison Officer (if required in terms of the contract), a list of suitable candidates from the database, from which the Contractor shall make his/her final selection. The contractor shall enter into written contracts of temporary employment with all targeted labour.

Any difficulty experienced by the Contractor in identifying candidates though the Job-Seekers Database, or as regards any matter relating to the employment of targeted labour, shall be immediately referred to the Employer's Agent.

3.5.2.4 Contract participation goal credits

Credits towards the achieving the minimum CPG_L shall be granted by converting the total monetary value of wages paid to targeted labour (including that of sub-contractors) to a percentage of the value of the contract. No credits shall be accorded should the contractor/sub-contractor fail to enter into written contracts with the targeted labour. Furthermore, no credits shall be accorded in respect of targeted labour employed on work in respect of provisional sums or prime cost items. Such labour shall nevertheless be recorded on the Project Labour Report which is required to be furnished by the Contractor.

3.5.2.5 Training of targeted labour

The Contractor is required to provide all informal (on-the-job) skills training so as to ensure that a minimum level of competence is achieved and maintained, such that the various activities are carried out safely and to the required standard. The cost of informal training shall be included in the rates for the various work activities.

3.5.2.6 Penalties

The financial penalty to be applied for failing to meet the specified minimum targeted labour contract participation goal in the performance of the contract (unless proven to be beyond the control of the Contractor), is as follows:

$$\text{Penalty} = (CPG_L^S - CPGLA) \times P^*$$

Where CPG_L^S = the specified minimum targeted labour contract participation goal (Expressed as a percentage).

CPG_L^A = the targeted labour contract participation goal achieved (expressed as a percentage).

P^* = the value of the contract.

3.5.3. COMMUNITY LIAISON OFFICER

Not Applicable.

3.5.4. PARTICIPATION OF TARGETED ENTERPRISES

3.5.4.1 Minimum targeted enterprises contract participation goal

It is a requirement of this contract that enterprises located within the target area, as defined, be engaged by the Contractor for the provision of supplies, services or works necessary for the performance of this contract.

To this end, a minimum targeted enterprises contract participation goal is specified below, which shall be achieved by the Contractor in the performance of the contract, failing which, penalties as described will be applied.

The specified minimum targeted enterprises contract participation goal (CPG_E) is | **0 %**

The Contractor shall engage targeted enterprises directly or indirectly in the performance of the contract to the extent that the total monetary value of such engagements (exclusive of VAT), expressed as a percentage of the value of the contract, is sufficient to achieve the specified minimum CPG_E.

3.5.4.2 Definitions

For the purposes of the requirements in respect of the participation of targeted enterprises, the following definitions shall apply:

"Target area" means the geographical area within the city of Cape Town metropolitan area.

"Targeted enterprises contract participation goal (CPG_E)" means the value of supplies, services or works (exclusive of VAT), for which the Contractor contracts targeted enterprises, either directly or indirectly, in the performance of the contract, expressed as a percentage of the value of the contract.

"Targeted enterprises" means any sole trader, partnership or legal entity that acts as a supplier, manufacturer, service provider or sub-contractor, and which has its base of operations in the target area.

"Value of the contract" means the contract sum (accepted contract amount) less provisional sums, contingencies and VAT.

3.5.4.3 Achieving the contract participation goal

The contractor may achieve the specified minimum CPG_E as follows:

a) by engaging one or more targeted enterprises to perform commercially useful functions in the performance of the contract;

b) by engaging non-targeted enterprises, who in turn engage one or more targeted enterprises to perform commercially useful functions in the performance of the contract;

c) by a combination of the above.

The Contractor shall, within 5 working days of being requested by the Employer's Agent to do so, submit details of his/her plan to achieve the minimum CPG_E.

3.5.4.4 Contract participation goal credits

Credits towards achieving the minimum CPG_E shall be granted by converting the total monetary value (exclusive of VAT) of the agreements between the Contractor, or Contractor's sub-contractors, and targeted enterprises, to a percentage of the value of the contract.

No credits shall be accorded should the Contractor (or sub-contractors):

a) make direct payment to third parties in connection with the contract on behalf of targeted enterprises, when such payment is recovered by making deductions from payments due to the targeted enterprise;

b) fail to enter into written contractual agreements with the relevant targeted enterprises.

Credits claimed towards the contract participation goal shall be denied where such written contractual agreements contain any of the following:

c) conditions which are more onerous than those that exist in the prime contract (this contract);

d) payment procedures based on a pay when paid system;

e) Authoritarian rights given to the employing contractor, with no recourse to independent adjudication in the event of a dispute arising.

No credits may be claimed in respect of targeted enterprises that that do not adhere to statutory labour practices.

No credits shall be accorded in respect of targeted enterprises engaged on work in respect of provisional sums or prime cost items.

In the event that a targeted enterprise sub-contracts to another targeted enterprise, only the value of the higher-level sub-contract shall be granted as credit towards achieving the specified minimum CPG_E.

In addition to the form required for contract administration (the Targeted Enterprises Contract Participation Expenditure Report), the Contractor shall furnish the Employer's Agent, upon written request, with documentary evidence that the targeted enterprises have their base of operations in the target area, copies of the contractual agreements with the various targeted enterprises, as well as documentary proof of payments made to the various targeted enterprises.

3.5.4.5 Penalties

The financial penalty to be applied for failing to meet the specified minimum targeted enterprises contract participation goal in the performance of the contract (unless proven to be beyond the control of the Contractor), is as follows:

$$\text{Penalty} = (CPG_E{}^S - CPGEA) \times P^*$$

Where $CPG_E{}^S$ = the specified minimum targeted enterprises contract participation Goal (expressed as a percentage).

$CPG_E{}^A$ = the targeted enterprises contract participation goal achieved (Expressed as a percentage).

P^* = the value of the contract.

3.5.5. ENVIRONMENTAL MANAGEMENT PROGRAMME

The Environmental Management Specification and its Annexures are included in Volume 3A.

3.5.6. HEALTH AND SAFETY

The Health and Safety Specification is included in Volume 3A.

[redacted]

C3.6 Annexes

CONTENTS

Annex 1: Monthly Project Labour Report

Annex 2: B-BBEE Sub-Contract Expenditure Report

Annex 3: Joint Venture Expenditure Report

Annex 4: Targeted Labour Contract Participation Expenditure Report

Annex 5: Targeted Enterprises Contract Participation Expenditure Report

Annex 6: Schedule 22.1-22.5: Declaration Certificate for Local Production and Content for Designated Sectors

Annex 7: Schedule 23: Price Basis for Imported Goods

Annex 8: Schedule 28: Technical Data Sheets

ANNEX 1

CITY OF CAPE TOWN
MONTHLY PROJECT LABOUR REPORT

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Instructions for completing and submitting this form

General

1 The Monthly Project Labour Reports must be completed in full, using typed, capital letter characters; alternatively, should a computer not be available, handwritten in black ink.
2 Incomplete / incorrect / illegible forms will not be accepted.
3 Any conditions relating to targeted labour stipulated in the Contract (in the case of contracted services / works) shall apply to the completion and submission of these forms.
4 This document is available in Microsoft Excel format upon request from the City's EPWP office, tel 021 400 9406 or email EPWPLR@capetown.gov.za.

Project Details

5 If a field is not applicable insert the letters: NA
6 Either a Contract (in the case of contracted out services or works) or a Works Project (in the case of direct employment by the City) name and number must be inserted. The name of the contract or works project may be abridged if necessary. In the case of term tenders the contract name and number must reflect the term tender as advertised.
7 On completion of the contract or works project the anticipated end date must be updated to reflect the actual end date.

Workers Details and Work Information

8 Care must be taken to ensure that worker details correspond accurately with the worker's ID document of which a **Certified copy must be kept for reporting.**

Jobseeker Database Reference Number

9 Unique number generated by Jobseekers system to confirm workers were sourced from the Jobseekers database operated by Subcouncils

New workers: Training; Reporting Threshold

10 A new worker is one in respect of which a new employment contract is signed in the current month.
11 Refers to work days only. Formal accredited Training / Non-accredited training that does not form part of on-the-job training must be excluded from this entry
12 All formal accredited / non-accredited training that does not form part of on-the-job training
13 Workers earning more than the maximum daily rate (Reporting Threshold) (currently R350 excluding any benefits) shall not be reflected on this form at all.

Submission of Forms

14 Signed hardcopy forms must be scanned and submitted to the City's project manager in electronic (.pdf) format, together with the completed form in Microsoft Excel format.
15 Scanned copies of all applicable supporting documentation must be submitted along with each monthly project labour report. Copies of employment contracts and **Certified ID documents** are only required in respect of new workers.
16 If a computer is not available hardcopy forms and supporting documentation will be accepted.
17 Failure to adhere to reporting requirements may result in the withholding of payment; penalties being applied or both

PROJECT DETAILS

Numbers in cells below e.g (6) refer to the relevant instruction above for completing and submitting forms

CONTRACT OR WORKS PROJECT NAME: (6)		CONTRACT OR WORKS PROJECT NUMBER: (6)	
DIRECTORATE:		DEPARTMENT:	
CONTRACTOR OR VENDOR NAME:		CONTRACTOR OR VENDOR E-MAIL ADDRESS:	
CONTRACTOR OR VENDOR CONTACT PERSON:		CONTRACTOR OR VENDOR TEL. NUMBER:	CELL – WORK –

PROJECT LABOUR REPORT CURRENT MONTH (mark with "X")

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR (insert last 2 digits)	2	0

ACTUAL START DATE (yyyy/mm/dd)								ANTICIPATED / ACTUAL END DATE (yyyy/mm/dd) (7)						
2	0							2	0					

TOTAL PROJECT EXPENDITURE / VALUE OF WORK DONE TO-DATE (INCLUDING ALL COSTS, BUT EXCLUDING VAT)														
R											–			

ANNEX 1 (continued)

MONTHLY PROJECT LABOUR REPORT

WORKER DETAILS AND WORK INFORMATION

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

CONTRACT OR WORKS PROJECT NUMBER:	

Year	Month		
		of	

	(8)	(8)	(8)	(9)	(10)			(11)	(12)	(13)
No.	First name	Surname	ID number	Jobseeker Database Reference Number	New Worker (Y/N)	Gender (M/F)	Disabled (Y/N)	No of days worked this month (excl. training)	No of training days this month (with stipend)	Rate of pay per day (R – c)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
								0	0	R -

Declared by Contractor or Vendor to be true and correct:	Name		Signature	
	Date			

Received by Employer's Agent Project Manager/ Representative:	Name		Signature	
	Date			

ANNEX 2

CITY OF CAPE TOWN

CONTRACT NO. AND NAME: .....

CONTRACTOR: .....

B-BBEE SUB-CONTRACT EXPENDITURE REPORT BASED ON PAYMENT CERTIFICATE NO. .....

Value of the contract (as defined in the **Preference Schedule**) (P*)	R	B-BBEE Status Level of Prime Contractor	

Name of Sub-contractor (list all)	**B-BBEE Status Level of Sub-contractor[1]**	**Total value of Sub-contract (excl. VAT)[1]**	**Value of Sub-contract work to date (excl. VAT)[1]**	**Value of Sub-contract work to Sub-contractors with a lower B-BBEE Status Level than Prime Contractor**
Sub-contractor A		R	R	R
Sub-contractor B		R	R	R
Sub-contractor C		R	R	R

[1]Documentary evidence to be provided

Total:	R
Expressed as a percentage of **P***	%

Signatures

Declared by Contractor to be true and correct: ..... **Date:** .....

Verified by Engineer/ Engineer's Agent's Representative: ..... **Date:** .....

ANNEX 3

CITY OF CAPE TOWN

CONTRACT NO. AND NAME: .....

CONTRACTOR: .....

JOINT VENTURE EXPENDITURE REPORT BASED ON PAYMENT CERTIFICATE NO. .....

Value of the contract (as defined in the **Preference Schedule**) (**P***)	R	B-BBEE Status Level of Joint Venture	

Name of Joint Venture partner (list all)	**B-BBEE Status Level of each JV partner as at contract award**	**Percentage contribution of JV partner per JV Agreement[1] A**	**Total value of JV partner's contribution (excl. VAT)[1] B = A% x P***	**Value of JV partner's contribution to date (excl. VAT)[1] C**	**Value of JV partner's contribution as a percentage of the work executed to date D = C/P*x100**
JV Partner A		%	R	R	%
JV Partner B		%	R	R	%
JV Partner C		%	R	R	%

[1]Documentary evidence to be provided

Signatures

Declared by Contractor to be true and correct: ..... **Date:** .....

Verified by Engineer/ Engineer's Representative: ..... **Date:** .....

ANNEX 4

CITY OF CAPE TOWN

CONTRACT NO. AND NAME: .....

CONTRACTOR: .....

TARGETED LABOUR CONTRACT PARTICIPATION EXPENDITURE REPORT BASED ON CERTIFICATE NO. .....

Not applicable to this tender

ANNEX 5

CITY OF CAPE TOWN

CONTRACT NO. AND NAME: .....

CONTRACTOR: .....

TARGETED ENTERPRISES CONTRACT PARTICIPATION EXPENDITURE REPORT BASED ON CERTIFICATE NO. .....

Not applicable to this tender

ANNEX 6 – SCHEDULE 22.1-22.5: DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

The "DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS" as submitted by the contractor for tender 376Q/2018/19, is incorporated into this Memorandum of Agreement by the mere reference thereof and subject to the content of the Clarification Notices issued by the Employer.

[redacted]

ANNEX 7 – SCHEDULE 23: PRICE BASIS FOR IMPORTED GOODS

Schedule 21: Price basis for imported plant & materials

Item Nr	Description	Value in foreign currency	Foreign currency	ROE at base date	Value in Rand	Customs Surcharge	Customs Duty	Total
2.1.1	Blowers	830 000,00	USD	15.2118	12 625 794,00	-	-	12 625 794,00
5.1.1	Crane	34 661,98	USD	15.2118	527 271,13	-	-	527 271,13
6.1.4	RAS Pumps East	70 947,39	EUR	17.0722	1 211 228,05	-	-	1 211 228,05
6.1.12	RAS Pumps West	67 352,45	EUR	17.0722	1 149 659,18	-	-	1 149 659,18
7.1.3	WAS Pumps	10 254,13	USD	15.2118	155 983,82	-	-	155 983,82
9.1.2	Mixers	258 108,31	EUR	15.2118	3 926 292,02	-	-	3 926 292,02
10.1.9 &10.1.10	Odour control	49 731,39	USD	15.2118	756 503,73	-	-	756 503,73
11.1.1 & 11.1.2	Actuators	50 925,91	GBP	18.4831	930 178,80	-	-	930 178,80
Section 12	FBDA	277 485,51	EUR	17.0722	4 737 288,17	-	-	4 737 288,17
25.1.1 & 25.1.2	Genset	534 567,33	GBP	17.0722	9 126 240,43	-	-	9 126 240,43
Schedule 2:	MCP PLC & HMI HARDWARE	17 527,76	EUR	17.0722	299 237,46	-	-	299 237,46
Schedule 16:	LV SWITCHGEAR, CONTROLGE	417 512,31	EUR	17.0722	7 127 853,60	-	-	7 127 853,60
Schedule 21:	CCTV EQUIPMENT & CONTROL	83 097,53	EUR	17.0722	1 418 857,71	-	-	1 418 857,71
Schedule 22:	INSTRUMENTATION (E&H + WE	63 129,23	EUR	17.0722	1 077 754,92	-	-	1 077 754,92
Schedule 22:	INSTRUMENTATION (HACH/PR	58 914,27	USD	15.2118	865 768,43	-	-	865 768,43
Schedule 23:	MV SWITCHGEAR	309 050,03	EUR	17.0722	5 276 163,95	-	-	5 276 163,95
Schedule 26:	DPFC EQUIPMENT & ANALYSE	505 050,76	USD	15.2118	7 682 731,13	-	-	7 682 731,13

[redacted]

[redacted]

[redacted]

ANNEX 8 – SCHEDULE 28: TECHNICAL DATA SHEETS

The Technical Data Sheets as submitted by the contractor for tender 376Q/2018/19, is incorporated into this Memorandum of Agreement by the mere reference thereof and subject to the content of the Clarification Notices issued by the Employer.

[redacted]

PART C4: SITE INFORMATION

C4 Site Information

CONTENTS

1. PROCESS INTERRUPTIONS

The wastewater works is in full operation and cannot be closed down, it is critical that any work carried out causes the least possible interruption to the plant and its processes.

[redacted]