ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
1.1	**FIXED - CHARGE ITEMS**				
1.1.1	Contractual Requirements	Sum	1		
	Establishment of Facilities on Site:				
	1) Facilities for Engineer (SANS 1200 AB)				
	NOTE: At Main Office only (no additional facilities at each reservoir)				
1.1.2	a) Furnished office	Sum	1		
1.1.3	b) Meeting room	Sum	1		
1.1.4	c) Nameboards (2 No.)	Sum	1		
1.1.5	d) Survey assistant	Sum	1		
1.1.6	e) Survey equipment	Sum	1		
1.1.7	f) Covered Parking Bays (2 No.)	Sum	1		
1.1.8	g) All other specified facilities (incl wifi internet connection and printer)	Sum	1		
	2) Facilities for Contractors				
	NOTE: Reservoirs on 3 seperate Sites; rates below to allow for Main Office plus satelite facilities at each reservoir site				
1.1.9	a) Office and storage sheds	Sum	1		
1.1.10	b) Workshops	Sum	1		
1.1.11	c) Laboratories	Sum	1		
1.1.12	d) Living accommodation	Sum	1		
1.1.13	e) Ablution and latrine facilities	Sum	1		
1.1.14	f) Tools and equipment	Sum	1		
1.1.15	g) Water supplied, electric power and communications.	Sum	1		
1.1.16	h) Dealing with water (Sub-clause 5.5)	Sum	1		
1.1.17	i) Access (Sub-clause 5.8)	Sum	1		
1.1.18	j) Plant	Sum	1		
1.1.19	General Responsibilities and other fixed charge obligations	Sum	1		
1.1.20	Removal of Engineer's and Contractor's site establishment on completion of works	Sum	1		
	Fixed charges associated with complying with Health and Safety Requirements:				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.1.21	a) Preparation of risk assessments, safe work procedures, the project H&S File, the H&S Plan, medicals for all workers, the provision of PPE and protective clothing, and all other fixed charge H&S matters that fulfill OHS Act 85 of 1993 and construction regulation 2014 requirements	Sum	1		
1.1.22	b) Completing and checking the Project H&S File and handing over the Client on completion of the works and exit medicals for all workers	Sum	1		
1.1.23	c) Provision of HIV/Aids Awareness plan and all necessary fixed charge items to achieve compliance with SANS 1921 Part 6 HIV/Aids Awareness	Sum	1		
1.1.24	Fixed charges associated with complying with the Environmental Management Plan	Sum	1		
1.2	**TIME-RELATED ITEMS**				
1.2.1	Contractual Requirements	Sum	1		
	Operate and maintain of Facilities on Site for the duration of the construction, except where otherwise stated:				
	1) Facilities for Engineer as per PSAB clause				
1.2.2	a) Furnished office	Sum	1		
1.2.3	b) Meeting room	Sum	1		
1.2.4	c) Nameboards (2 No.)	Sum	1		
1.2.5	d) Survey assistant	Sum	1		
1.2.6	e) Survey equipment	Sum	1		
1.2.7	f) Covered Parking Bays (2 No.)	Sum	1		
1.2.8	g) All other specified facilities (incl wifi internet connection and printer)	Sum	1		
	2) Facilities for Contractor				
1.2.9	a) Office and storage sheds	Sum	1		
1.2.10	b) Workshops	Sum	1		
1.2.11	c) Laboratories	Sum	1		
1.2.12	d) Living accommodation	Sum	1		
1.2.13	e) Ablution and latrine facilities	Sum	1		
1.2.14	f) Tools and equipment	Sum	1		
1.2.15	g) Water supplied, electric power and communications.	Sum	1		
1.2.16	h) Dealing with water (Sub-clause 5.5)	Sum	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.2.17	i) Access (Sub-clause 5.8)	Sum	1		
1.2.18	j) Plant	Sum	1		
1.2.19	Supervision for duration of construction	Sum	1		
1.2.20	Company and head office overhead costs for the duration of the contract	Sum	1		
1.2.21	General Responsibilities and other time-related obligations (including making allowance for effects and payments taking up to 60 days from date of invoice)	Sum	1		
	Time-related charges associated with complying with Health and Safety Requirements:				
1.2.22	a) Updating and amending the risk assessments, safe work procedures, the project H&S File, the H&S Plan,medicals for all workers, the provision of PPE and protective clothing and all other H&S matters that fulfill OHS Act 85 of 1993 and construction regulation 2014	Sum	1		
1.2.23	b) Full compliance with all H&S matters during the construction of the works under the Contract	Sum	1		
1.2.24	c) Compliance with SANS 1921 Part 6 HIV/Aids Awareness plan during the contract	Sum	1		
1.2.25	Time-related charges associated with complying with the Environmental Management Plan	Sum	1		
1.3	**TEMPORARY WORKS**				
1.3.1	Construct and maintain access to works	Sum	1		
1.3.2	Accommodation of traffic	Sum	1		
TOTAL FOR SECTION 1 CARRIED FORWARD TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
2.1	**DAYWORKS**				
	LABOUR				
2.1.1	a) Team leader / charge hand	hr	50		
2.1.2	b) Artisan	hr	50		
2.1.3	c) Skilled	hr	100		
2.1.4	d) Semi-skilled	hr	200		
2.1.5	e) Unskilled	hr	200		
	PLANT				
	For plant used in execution of dayworks				
2.1.6	As agreed with engineer	PC Sum	1	30 000,00	30 000,00
2.1.7	Mark up on item 2.1.6 above	%			
	MATERIALS				
2.1.8	For materials used in execution of dayworks as agreed with engineer	PC Sum	1	30 000,00	30 000,00
2.1.9	Mark up on item 2.1.8 above	%			
2.2	**SUM STATED PROVISIONALLY BY THE ENGINEER**				
2.2.1	ENGINEER				
2.2.1.1	Cellphone allowance for the Engineer for the duration of the contract (R500 pm).	Prov.Sum	1	9 000,00	9 000,00
2.2.1.2	Overheads, Charges and Profit on item 2.2.1.1 above	%	9 000,00		
2.2.1.3	Rental Vehicle for the Engineer for the duration of the contract	Prov.Sum	1	720 000,00	720 000,00
2.2.1.4	Overheads, Charges and Profit on item 2.2.1.3 above	%	720 000,00		
2.2.1.5	Equipment for the Engineer	Prov.Sum	1	50 000,00	50 000,00
2.2.1.6	Overheads, Charges and Profit on item 2.2.1.5 above	%	50 000,00		
2.2.2	EXISTING SERVICES				
2.2.2.1	Removal and re-establishment of existing services by Telkom, Eskom and/or the Local Authority	Prov.Sum	1	200 000,00	200 000,00
2.2.2.2	Overheads, Charges and Profit on item 2.2.2.1 above	%	200 000,00		
2.2.3	TOPOGRAPHICAL SURVEY				
2.2.3.1	Ad-hoc survey as requested by the Engineeer.	Prov.Sum	1	100 000,00	100 000,00
2.2.3.2	Overheads, Charges and profit on item 2.2.3.1 above	%	100 000,00		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
2.2.4	COMMUNITY LIASON OFFICER				
2.2.4.1	Employment of CLO for the duration of the contract (R7500 pm plus R500 pm cellphone and data allowance)	Prov.Sum	1	144 000,00	144 000,00
2.2.4.2	Overheads, Charges and Profit on item 2.2.4.1 above	%	144 000,00		
2.2.4.3	Employment of PSC for duration of contract (6 No. at R500 pm each)	Prov.Sum	1	54 000,00	54 000,00
2.2.4.4	Overheads, Charges and Profit on item 2.2.4.3 above	%	54 000,00		
2.2.5	INDEPENDANT INSPECTORATE				
2.2.5.1	Independent inspectorate (welds and coatings for pipe specials)	PC Sum	1	100 000,00	100 000,00
2.2.5.2	Overheads, Charges and Profit on item 2.2.5.1 above	%	100 000,00		
2.2.5.3	Independent inspectorate (concrete)	PC Sum	1	150 000,00	150 000,00
2.2.5.4	Overheads, Charges and Profit on item 2.2.5.1 above	%	150 000,00		
2.2.6	TRAINING				
2.2.6.1	Allowance for training of local unskilled labour	PC Sum	1	100 000,00	100 000,00
2.2.6.2	Overheads, Charges and profit on item 2.2.21 above	%	100 000,00		
2.2.7	STUDENT				
2.2.7.1	Student monthly allowance for the for the duration of the contract (R10000 pm).	Prov.Sum	2	180 000,00	360 000,00
2.2.7.2	Overheads, Charges and Profit on item 2.2.25 above	%	360 000,00		
2.2.7.3	Transportation for the Student for the duration of the contract (R1000 pm	Prov.Sum	2	18 000,00	36 000,00
2.2.7.4	Overheads, Charges and Profit on item 2.2.27 above	%	36 000,00		
2.2.7.5	Accomodation for the Student for the duration of the contract (R2500 pm).	Prov.Sum	2	45 000,00	90 000,00
2.2.7.6	Overheads, Charges and Profit on item 2.2.29 above	%	90 000,00		
2.2.8	COMPENSATION				
2.2.8.1	Purchase and deliver compensation items (fencing / bags of fertiizer or cement etc.) to affected residents as directed by the Engineer	PC Sum	1	100 000,00	100 000,00
2.2.8.2	Overheads, Charges and Profit on item 2.2.23 above	%	100 000,00		
2.2.9	LOCAL SUBCONTRACTOR				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
2.2.9.1	Provide 500kl prefabricated GMS reservoir ('Abeco' of similar) on reinforced concrete ground beams atEzinkoweni and associated pipeworks (Quotes to be called)	PC Sum	1	2 500 000,00	2 500 000,00
2.2.9.2	Overheads, Charges and Profit on item 2.2.9.1 above	%	2 500 000,00		
2.2.10	VEHICLE Source3 Quotes, purchase and deliver to the Employer within 2 months of commencement of the Works				
2.2.10.1	New single cab diesel 2x4 LDV, Japanese make, 2.5 litre or bigger engine, registered in Employer's name,	PC Sum	1	750 000,00	750 000,00
2.2.10.2	Overheads, Charges and Profit on item 2.2.10.1 above	%	750 000,00		
TOTAL FOR SECTION 2 CARRIED FORWARD TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
3.1	**EARTHWORKS**				
3.1.1	Site Clearance and Removal of Topsoil				
3.1.1.1	Clear Reservoir Site	ha	0,3		
3.1.1.2	Remove topsoil to nominal depth of 150 mm and stockpile and maintain	m²	3000		
3.1.2	Bulk Excavation				
3.1.2.1	Excavate in all materials using 30t excavator fitted with 3-tyne rock bucket to bulk excavation line (equal to finished floor level of reservoir), stockpile and maintain for backfill and dispose of all material not suitable for backfill to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:2 and compacting) Extra-over Item 3.1.2.1 for excavation in :	m³	1650		
3.1.2.2	Hard rock material (heavy-duty mounted hydraulic breaker)	m³	1500		
	Backfilling against reservoir and landscaping on completion				
3.1.2.3	Excavate from stockpile, backfill and compact to 90% ModAASHTO against reservoir and landscape Site as directed by the Engineer and dispose of any remaining excess material	m³	472		
3.1.3	Restricted Excavation				
3.1.3.1	Excavate down to sound foundation level (as directed by the Engiineer) using 30t excavator fitted with 3-tyne rock bucket for reservoir and chambers in all materials and use for backfill or embankment or dispose	m³	500		
	Extra over item 3.1.3.1 for:				
3.1.3.2	Excavation of hard rock material using heavy-duty mounted hydraulic breaker	m³	150		
	Extra excavation for workspace				
3.1.3.3	Excavation for workspace (downwards from bulk excavation level)	m²	100		
3.1.4	Overhaul				
3.1.4.1	Extra-over items 3.1.2.1 and 3.1.3.1 and 3.1.2.3 for overhaul of spoil material to approved disposal site	m³.km	500		
	Layer works to backfill over-excavation of unsuitable material:				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.1.4.2	Supply G5 subbase, place and compact in 200mm layers under reservoir (Prov) stabilised with 3% ordinary portland cement (to create C4 material as directed by the Engineer) compacted to 98% mod AASHTO density	m³	1000		
3.1.4.3	Supply G2 crusher run, place and compact in max 200mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	150		
3.1.4.4	Fill to underside reservoir floor with 15MPa/20 mass concrete where directed by the Engineer	m³	40		
3.1.5	Importing of Materials				
3.1.5.1	Import approved topsoil from commercial source (provisional)	m³	50		
3.1.5.2	Import approved 19 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	40		
3.1.6	Finishing				
3.1.6.1	Topsoiling	m²	450		
3.1.6.2	Grassing (plant stolons at 300mm c/c grid harvested from vicinity) and maintain until atleast 50% cover achieved	m²	450		
3.2	**PIPE EXCAVATIONS**				
3.2.1	Excavate in all material for trenches backfill and dispose of surplus and unsuitable material. Rate to include for all temporary works including trimming, shoring and dewatering where necessary.	m³	70		
	(b) Extra over item 3.2.1 for excavation in:				
3.2.2	Hard rock using heavy-duty hydraulic breaker	m³	30		
3.3	**REINFORCED CONCRETE**				
3.3.1	FORMWORK				
	Rough vertical to degree of accuracy III				
3.3.1.1	Footings to walls (curved)	m²	45		
3.3.1.2	Walls outside below ground level (curved)	m²	85		
3.3.1.3	Sump & encasement to pipes	m²	30		
3.3.1.4	Chambers	m²	25		
	Smooth vertical to degree of accuracy II				
3.3.1.5	Walls inside & outside above ground level (curved)	m²	990		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.3.1.6	Column bases	m²	29		
3.3.1.7	Footing at expansion joint	m²	18		
3.3.1.8	Circular Columns	m²	90		
3.3.1.9	Roof slab & upstand	m²	50		
3.3.1.10	Sump	m²	1,5		
3.3.1.11	Manhole cover slab	m²	3		
3.3.1.12	Manholes	m²	5		
	Smooth horizontal to degree of accuracy II				
3.3.1.13	Roof soffit	m²	530		
3.3.1.14	Chambers	m²	20		
	Box-outs for pipe specials to be installed then grouted in place:				
	1) Box-out in outer chamber wall to accommodate:				
3.3.1.15	a) DN200 inlet pipe	No.	1		
3.3.1.16	b) DN200 overflow/scour drain pipe	No.	1		
3.3.1.17	c) DN200 outlet pipe	No.	1		
	2) Grout specials in place				
3.3.1.18	a) DN200 inlet pipe	No.	1		
3.3.1.19	b) DN200 overflow / scour pipe	No.	1		
3.3.1.20	c) DN200 outlet pipe	No.	1		
	3) Box-out in reservoir roof to accommodate:				
3.3.1.21	b) DN200 air vents	No.	4		
3.3.1.22	c) DN150 roof drainage outlets	No.	8		
3.3.2	REINFORCEMENT				
	Mild steel bars				
3.3.2.1	All sizes	t	9		
	High-tensile steel bars				
3.3.2.2	All sizes	t	83		
	High-Tensile Welded Mesh				
3.3.2.3	Type reference #245	m²	95		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.3.2.4	Type reference #193	m²	80		
3.3.3	CONCRETE				
3.3.3.1	75mm No-fines concrete under floor complete with smooth dry-mix plaster scratch-coat on surface	m³	200		
	Blinding Layer (Grade 15/19 MPa)				
3.3.3.2	50mm blinding layer	m³	30		
	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
3.3.3.3	Walls above footing	m³	160		
3.3.3.4	Footings to walls	m³	60,5		
3.3.3.5	Floor slabs	m³	114		
3.3.3.6	Roof slab & upstand	m³	142		
3.3.3.7	Columns with bases	m³	21		
3.3.3.8	Encasement to inlet / outlet / overflow / scour pipes and sump	m³	29		
3.3.3.9	Inlet & outlet chambers	m³	36		
	Strength concrete: 15 MPa/19 mm				
3.3.3.10	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	1,5		
3.3.3.11	Mass concrete including splash aprons from roof overflow, V-drain and filling under reservoir footings (where ordered by the Engineer)	m³	20		
	Strength 25MPa/19mm concrete				
3.3.3.12	25MPa/19mm concrete to benching	m³	5		
3.3.4	UNFORMED SURFACE FINISHES				
	(a) Wood-floated finish (to degree of accuracy II)				
3.3.4.1	Top of reservoir wall footing (outside)	m²	34		
3.3.4.2	Reservoir roof	m²	545		
3.3.4.3	Invert to reservoir sump	m²	4		
3.3.4.4	Top of upstand	m²	13		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	(b) Steel-floated (to degree of accuracy II)				
3.3.4.5	Top of reservoir Wall	m²	25		
3.3.4.6	Top Reservoir Floor Slab & Footing inside	m²	535		
3.3.4.7	Top of column Bases	m²	26		
3.3.5	JOINTS NOTE: Flexible bandages over floor joints to be carried out by approved Specialist Subcontractor.				
3.3.5.1	Allowance for Specialist Subcontractor to supply & install flexible bandage jointing	PC Sum	1	150 000,00	150 000,00
3.3.5.2	Overheads, Charges and profit on item 2.2.3.1 above	%	150 000,00		
3.3.5.3	1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with 250mm rearguard waterstop and 15mm Closed cell Polyethylene 100kg/m or closed cell high density void formeras per detail on drawings	m	76		
3.3.5.4	2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with 250mm rearguard waterstop with centre bulb	m	48		
3.3.5.5	3) Horizontal construction joints in reservoir walls (as per drawings) measured by the total length of construction joints complete with 150mm wide by 1.6mm thick galvanised mild steel strips waterstop and 150mm wide Lanko Bandage or similar approved	m	83		
3.3.5.6	4) Isolation Joints in reservoir external perimeter slab (as per drawings)	m	175		
3.3.6	MISCELLANEOUS CONCRETE ITEMS				
3.3.6.1	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	83		
3.3.6.2	Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	83		
3.3.6.3	Concrete planks to reservoir over outlet manhole to reservoir.	No	4		
3.3.6.4	Cast in situ standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around resevoir perimeter (see standard detail drg). Mesh ref 245 measured elsewhere	m	93		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.3.6.5	200gm/m2 needle punched geotextile (1m width)	m²	93		
3.3.6.6	Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
3.3.6.7	150mm dia glvanised outlets, cut from a 150mm dia pipe with metal guaze vermin proof (GALVANISED AFTER FABRICATION) as per detail on the drawings (300mm long)	No	8		
	Manhole items				
3.3.6.8	Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
3.3.6.9	Concrete cover slab complete with manhole frame cast in, including lifting hooks. Note payment of cast iron manhole frame and cover paid seperately	No	1		
3.3.6.10	Manhole cover (to SABS 558) type 9E with frame	No	1		
	WATER TIGHTNESS TESTING - NOTE: Water is unliklely to be available until near the end of the Defects Liability Period. The Employer and Employer's Agent will carry out the test and advise if repairs are required.				
3.3.6.11	Cleaning and sterilizing reservoir and associated pipework ready to fill with water for testing immediately prior to Practical Completion Inspection	Sum	1		
3.4	**STRUCTURAL STEELWORK**				
	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
	Access ladders with cage				
3.4.1	Internal 6.8m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
3.4.2	External 5.1m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
3.4.3	2m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
	Reservoir and Chambers' roof elements				
3.4.4	Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	1		
3.4.5	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	Air Vents				
3.4.6	GMS DN200 reservoir ventilators as per detail on drawings	No	4		
3.5	**PIPEWORK**				
	SPECIALS AND FITTINGS				
	Supply, handle, install and commission complete with couplings and GMS nuts and bolts and corrosion protection (all bolted connections to be coated with Tectile mastic and bandaged with petrolatum saturated textile (Denso or equivalent)				
	All pipework to be FBE coated and lined mild steel (min 300 micron DFT), 4mm wall thickness.				
3.5.1	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	OVERFLOW & SCOUR DRAINAGE PIPELINES				
3.5.1.1	200mm diameter uPVC Class 34 Heavy Duty Drainage Pipe	m	100		
	OUTLET				
3.5.1.2	O1: DN300 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end . 1100mm C/F other end 2900mm C/F	No.	1		
3.5.1.3	O2: DN300 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
3.5.1.4	O3: DN300 VJ or similar approved flange adaptor for steel pipe	No.	1		
3.5.1.5	O4: DN300 epoxy coated and lined mild steel PN16, one end flanged and other plain, 200mm long.	No.	1		
3.5.1.6	O5: DN300 Electro Magnetic flow meter (Endress Hauser or similar approved)	No.	1		
3.5.1.7	O6: DN100 Double acting "VENT-O-MAT" air valve or similar approved, PN16	No.	1		
3.5.1.8	O7: DN100 RSV gate valve flanged PN16 with non-rising spindle and handwheel	No.	1		
3.5.1.9	O8: DN300 epoxy coated and lined mild steel pipe flanged, PN16, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm long. Branch to be located 500mm C/F and extending 350mm C/F.	No.	1		
3.5.1.10	O9: DN300 epoxy coated blank flange	No.	1		
	OVERFLOW				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.5.1.11	OV1: DN300 epoxy coated and lined mild steel pipe, buttressed flanged PN16 one end and DN450 bellmouth with 4 No. anti-vortex baffles the other end. 3250mm F/BELLMOUTH.	No.	1		
3.5.1.12	OV2: DN300 epoxy coated and lined mild steel 90° bend. Buttressed flanged PN16 one end and plain ended the other. 1250mm c/f and 3000mm c/plain end.	No.	1		
	SCOUR				
3.5.1.13	S1: DN200 epoxy coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 11300mm c/f.	No.	1		
3.5.1.14	S2: DN200 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
3.5.1.15	S3: DN200 Rilsan coated and lined mild steel short radius 90° bend. Flanged PN10 one end and plain ended the other end with standard c/f dimensions.	No.	1		
	INLET				
3.5.1.16	IN1: DN300 epoxy coated and lined mild short radius 90° bend. Flanged, PN16, one end. 1100mm C/F other end 2900mm C/F.	No.	1		
3.5.1.17	IN2: DN300 x DN200 epoxy coated and lined mild steel reducer, flanged PN16 both ends, 400mm long.	No.	2		
3.5.1.18	IN3: DN200 PN16 flanged non-modulating Bermad (or similar approved) floatl control valve	No.	1		
3.5.1.19	IN4: DN200 x DN200mm long flanged epoxy coated and lined muild steel pipe.	No.	2		
3.5.1.20	IN5: DN200 Battery-powered Electro magnetic flow meter (Endress Hauser or similar approved) complete with stainless steel grounding rings linked to earthing spike in the ground outside.	No.	1		
3.5.1.21	IN6: DN300 PN16 flanged double off-set butterfly valve with gearbox and handwheel	No.	1		
3.5.1.22	IN7: DN300 VJ or similar approved flange adaptor for steel pipe.	No.	1		
3.5.1.23	IN8: DN300 epoxy coated and lined mild steel pipe flanged, PN16, with DN100 flanged PN10 branch. Pipe barrel 1800mm. Branch 500mm C/F end and extending 350mm C/F	No.	1		
3.5.1.24	IN9: DN300 epoxy coated blank flange	No.	1		
3.5.1.25	IN10: DN100 RSV gate valve flanged PN10 with non-rising spindle and handwheel	No.	2		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.5.1.26	IN11: DN100 double acting "VENT-O-MAT" air valve or similar approved, PN16	No.	1		
3.6	**BEDDING (overflow and scour pipelines)**				
	Provision of bedding from available sources on site				
3.6.1	Selected fill material	m³	20		
	Supply only of bedding by importation (provisional)from commercial sources				
3.6.2	Selected granular material	m³	20		
3.6.3	SUBSOIL DRAINAGE (Reservoir)				
	Supply and lay (as detailed on drawing):				
3.6.3.1	Sand compacted to 100% Mod AASHTO	m³	30		
3.6.3.2	19mm crushed stone	m³	30		
3.6.3.3	200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	750		
3.6.3.4	110mm diameter class 4 slotted drainage pipe complete with all fittings. i.e. elbows, endcaps and tee connections to suit details on the drawings	m	280		
3.7	**RESERVOIR FENCING AND SITEWORKS**				
	FENCING				
3.7.1	Supply and install fencing around reservoir complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	300 000,00	300 000,00
3.7.2	Charges on profit on item 3.7.1 above	%	300 000,00		
3.8	**EARTHWORKS (ROADS, SUBGRADE)**				
	RESERVOIR ACCESS ROAD				
	Road-bed preparation and compaction of material				
3.8.1	Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	175		
3.8.2	**WEARING COURSE**				
3.8.2.1	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	300		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
3.9	**GABIONS AND PITCHING**				
3.9.1	Surface preparation for bedding of gabions with approved excavated material	m²	10		
3.9.2	1mx1mx2m Gabions	m³	6		
3.9.3	230mm thick reno mattress	m²	10		
3.9.4	200grm/m2 needlepunched geofabric	m²	20		
3.9.5	Construct headwall complete with 2.2m wide by 3m long stone pitched scour apron, see detail drawing and build-in DN200 PVC pipe	Sum	1		
TOTAL FOR SECTION 3 CARRIED FORWARD TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
4.1	**EARTHWORKS**				
4.1.1	Site Clearance and Removal of Topsoil				
4.1.1.1	Clear Reservoir Site	ha	0,3		
4.1.1.2	Remove topsoil to nominal depth of 150 mm and stockpile and maintain	m²	3000		
4.1.2	Bulk Excavation				
4.1.2.1	Excavate in all materials using 30t excavator fitted with 3-tyne rock bucket to bulk excavation line (equal to finished floor level of reservoir), stockpile and maintain for backfill and dispose of all material not suitable for backfill to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:2 and compacting) Extra-over Item 4.1.2.1 for excavation in :	m³	1000		
4.1.2.2	Hard rock material (heavy-duty mounted hydraulic breaker)	m³	840		
	Backfilling against reservoir and landscaping on completion				
4.1.2.3	Excavate from stockpile, backfill and compact to 90% ModAASHTO against reservoir and landscape Site as directed by the Engineer and dispose of any remaining excess material	m³	1000		
4.1.3	Restricted Excavation				
4.1.3.1	Excavate down to sound foundation level (as directed by the Engiineer) using 30t excavator fitted with 3-tyne rock bucket for reservoir and chambers in all materials and use for backfill or embankment or dispose	m³	500		
	Extra over item 4.1.3.1 for:				
4.1.3.2	Excavation of hard rock material using heavy-duty mounted hydraulic breaker	m³	150		
	Extra excavation for workspace				
4.1.3.3	Excavation for workspace (downwards from bulk excavation level)	m²	100		
4.1.4	Overhaul				
4.1.4.1	Extra-over items 4.1.2.1 and 4.1.3.1 and 4.1.2.3 for overhaul of spoil material to approved disposal site	m³.km	500		
	Layer works to backfill over-excavation of unsuitable material:				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.1.4.2	Supply G5 subbase, place and compact in 200mm layers under reservoir (Prov) stabilised with 3% ordinary portland cement (to create C4 material as directed by the Engineer) compacted to 98% mod AASHTO density	m³	111		
4.1.4.3	Supply G2 crusher run, place and compact in max 200mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	111		
4.1.4.4	Fill to underside reservoir floor with 15MPa/20 mass concrete where directed by the Engineer	m³	40		
4.1.5	Importing of Materials				
4.1.5.1	Import approved topsoil from commercial source (provisional)	m³	95		
4.1.5.2	Import approved 19 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	40		
4.1.6	Finishing				
4.1.6.1	Topsoiling	m²	620		
4.1.6.2	Grassing (plant stolons at 300mm c/c grid harvested from vicinity) and maintain until atleast 50% cover achieved	m²	620		
4.2	**PIPE EXCAVATIONS**				
4.2.1	Excavate in all material for trenches backfill and dispose of surplus and unsuitable material. Rate to include for all temporary works including trimming, shoring and dewatering where necessary.	m³	70		
	Extra over item 4.2.1 for excavation in:				
4.2.2	Hard rock using heavy-duty hydraulic breaker	m³	30		
4.3	**REINFORCED CONCRETE**				
4.3.1	FORMWORK				
	Rough vertical to degree of accuracy III				
4.3.1.1	Footings to walls (curved)	m²	42		
4.3.1.2	Walls outside below ground level (curved)	m²	100		
4.3.1.3	Sump & encasement to pipes	m²	30		
4.3.1.4	Chambers	m²	25		
	Smooth vertical to degree of accuracy II				
4.3.1.5	Walls inside & outside above ground level (curved)	m²	730		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.3.1.6	Column bases	m²	29		
4.3.1.7	Footing at expansion joint	m²	18		
4.3.1.8	Circular Columns	m²	90		
4.3.1.9	Roof slab & upstand	m²	38		
4.3.1.10	Sump	m²	1,5		
4.3.1.11	Manhole cover slab	m²	3		
4.3.1.12	Manholes	m²	5		
	Smooth horizontal to degree of accuracy II				
4.3.1.13	Roof soffit	m²	515		
4.3.1.14	Chambers	m²	20		
	Box-outs for pipe specials to be installed then grouted in place:				
	1) Box-out in outer chamber wall to accommodate:				
4.3.1.15	a) DN200 inlet pipe	No.	1		
4.3.1.16	b) DN200 overflow/scour drain pipe	No.	1		
4.3.1.17	c) DN200 outlet pipe	No.	1		
	2) Grout specials in place				
4.3.1.18	a) DN200 inlet pipe	No.	1		
4.3.1.19	b) DN200 overflow / scour pipe	No.	1		
4.3.1.20	c) DN200 outlet pipe	No.	1		
	3) Box-out in reservoir roof to accommodate:				
4.3.1.21	a) DN100 holes for sampling equipment	No.	2		
4.3.1.22	b) DN200 air vents	No.	4		
4.3.1.23	c) DN150 roof drainage outlets	No.	8		
4.3.2	REINFORCEMENT				
	Mild steel bars				
4.3.2.1	All sizes	t	8		
	High-tensile steel bars				
4.3.2.2	All sizes	t	76		
	High-Tensile Welded Mesh				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.3.2.3	Type reference #245	m²	95		
4.3.2.4	Type reference #193	m²	80		
4.3.3	CONCRETE				
4.3.3.1	75mm No-fines concrete under floor complete with smooth dry-mix plaster scratch-coat on surface	m³	20		
	Blinding Layer (Grade 15/19 MPa)				
4.3.3.2	50mm blinding layer	m³	30		
	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
4.3.3.3	Walls above footing	m³	155		
4.3.3.4	Footings to walls	m³	47		
4.3.3.5	Floor slabs	m³	114		
4.3.3.6	Roof slab & upstand	m³	135		
4.3.3.7	Columns with bases	m³	18		
4.3.3.8	Encasement to inlet / outlet / overflow / scour pipes and sump	m³	29		
4.3.3.9	Inlet & outlet chambers	m³	36		
	Strength concrete: 15 MPa/19 mm				
4.3.3.10	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	1,5		
4.3.3.11	Mass concrete including splash aprons from roof overflow, V-drain and filling under reservoir footings (where ordered by the Engineer)	m³	20		
	Strength 25MPa/19mm concrete				
4.3.3.12	25MPa/19mm concrete to benching	m³	5		
4.3.4	UNFORMED SURFACE FINISHES				
	(a) Wood-floated finish (to degree of accuracy II)				
4.3.4.1	Top of reservoir wall footing (outside)	m²	33		
4.3.4.2	Reservoir roof	m²	515		
4.3.4.3	Invert to reservoir sump	m²	4		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.3.4.4	Top of upstand	m²	13		
	(b) Steel-floated (to degree of accuracy II)				
4.3.4.5	Top of reservoir Wall	m²	25		
4.3.4.6	Top Reservoir Floor Slab & Footing inside	m²	500		
4.3.4.7	Top of column Bases	m²	26		
4.3.5	JOINTS				
	NOTE: Flexible bandages over floor joints to be carried out by approved Specialist Subcontractor.				
4.3.5.1	Allowance for Specialist Subcontractor to supply & install flexible bandage jointing	PC Sum	1	120 000,00	120 000,00
4.3.5.2	Overheads, Charges and profit on item 2.2.3.1 above	%	120 000,00		
4.3.5.3	1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with 250mm rearguard waterstop and 15mm Closed cell Polyethylene 100kg/m or closed cell high density void formeras per detail on drawings	m	75		
4.3.5.4	2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with 250mm rearguard waterstop with centre bulb	m	48		
4.3.5.5	3) Horizontal construction joints in reservoir walls (as per drawings) measured by the total length of construction joints complete with 150mm wide by 1.6mm thick galvanised mild steel strips waterstop and 150mm wide Lanko Bandage or similar approved	m	83		
4.3.5.6	4) Isolation Joints in reservoir external perimeter slab (as per drawings)	m	168		
4.3.6	MISCELLANEOUS CONCRETE ITEMS				
4.3.6.1	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	80		
4.3.6.2	Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	81		
4.3.6.3	Concrete planks to reservoir over outlet manhole to reservoir.	No	4		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.3.6.4	Cast in situ standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around resevoir perimeter (see standard detail drg). Mesh ref 245 measured elsewhere	m	85		
4.3.6.5	200gm/m2 needle punched geotextile (1m width)	m²	93		
4.3.6.6	Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
4.3.6.7	150mm dia glvanised outlets, cut from a 150mm dia pipe with metal guaze vermin proof (GALVANISED AFTER FABRICATION) as per detail on the drawings (300mm long)	No	18		
	WATER TIGHTNESS TESTING - NOTE: Water is unliklely to be available until near the end of the Defects Liability Period. The Employer and Employer's Agent will carry out the test and advise if repairs are required.				
4.3.6.8	Cleaning and sterilizing reservoir and associated pipework ready to fill with water for testing immediately prior to Practical Completion Inspection	Sum	1		
	Manhole items				
4.3.6.9	Concrete cover plank without manhole,including lifting hooks and air vents.	No	1		
4.3.6.10	Concrete cover plank complete with manhole frame cast in, including lifting hooks. Note payment of cast iron manhole frame and cover paid seperately	No	1		
4.3.6.11	Manhole cover (to SABS 558) type 9E with frame	No	1		
4.4	**STRUCTURAL STEELWORK**				
	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
	Access ladders with cage				
4.4.1	Internal 5m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
4.4.2	External 3.3m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
4.4.3	2m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
	Reservoir and Chambers' roof elements				
4.4.4	Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.4.5	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	Air Vents				
4.4.6	GMS DN200 reservoir ventilators as per detail on drawings	No	4		
4.5	**PIPEWORK**				
	SPECIALS AND FITTINGS				
	Supply, handle, install and commission complete with couplings and GMS nuts and bolts and corrosion protection (all bolted connections to be coated with Tectile mastic and bandaged with petrolatum saturated textile (Denso or equivalent)				
	All pipework to be FBE coated and lined (min 300 micron DFT) mild steel, 4mm wall thickness.				
4.5.1	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	OVERFLOW & SCOUR DRAINAGE PIPELINES				
4.5.1.1	200mm diameter uPVC Class 34 Heavy Duty Drainage Pipe	m	100		
	OUTLET				
4.5.1.2	O1: DN300 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end . 1100mm C/F other end 2900mm C/F	No.	1		
4.5.1.3	O2: DN300 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
4.5.1.4	O3: DN300 VJ or similar approved flange adaptor for steel pipe	No.	1		
4.5.1.5	O4: DN300 epoxy coated and lined mild steel PN16, one end flanged and other plain, 200mm long.	No.	1		
4.5.1.6	O5: DN300 Electro Magnetic flow meter (Endress Hauser or similar approved)	No.	1		
4.5.1.7	O6: DN100 Double acting "VENT-O-MAT" air valve or similar approved, PN16	No.	1		
4.5.1.8	O7: DN100 RSV gate valve flanged PN16 with non-rising spindle and handwheel	No.	1		
4.5.1.9	O8: DN300 epoxy coated and lined mild steel pipe flanged, PN16, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm long. Branch to be located 500mm C/F and extending 350mm C/F.	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.5.1.10	O9: DN300 epoxy coated blank flange	No.	1		
	OVERFLOW				
4.5.1.11	OV1: DN300 epoxy coated and lined mild steel pipe, buttressed flanged PN16 one end and DN450 bellmouth with 4 No. anti-vortex baffles the other end. 3250mm F/BELLMOUTH.	No.	1		
4.5.1.12	OV2: DN300 epoxy coated and lined mild steel 90° bend. Buttressed flanged PN16 one end and plain ended the other. 1250mm c/f and 3000mm c/plain end.	No.	1		
	SCOUR				
4.5.1.13	S1: DN200 epoxy coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 11300mm c/f.	No.	1		
4.5.1.14	S2: DN200 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
4.5.1.15	S3: DN200 Rilsan coated and lined mild steel short radius 90° bend. Flanged PN10 one end and plain ended the other end with standard c/f dimensions.	No.	1		
	INLET				
4.5.1.16	IN1: DN300 epoxy coated and lined mild short radius 90° bend. Flanged, PN16, one end. 1100mm C/F other end 2900mm C/F.	No.	1		
4.5.1.17	IN2: DN300 x DN200 epoxy coated and lined mild steel reducer, flanged PN16 both ends, 400mm long.	No.	2		
4.5.1.18	IN3: DN200 PN16 flanged non-modulating Bermad float control valve	No.	1		
4.5.1.19	IN4: DN200 x DN200mm long flanged epoxy coated and lined muild steel pipe.	No.	2		
4.5.1.20	IN5: DN200 Battery-powered Electro magnetic flow meter (Endress Hauser or similar approved) complete with stainless steel grounding rings linked to earthing spike in the ground outside.	No.	1		
4.5.1.21	IN6: DN300 PN16 flanged double off-set butterfly valve with gearbox and handwheel	No.	1		
4.5.1.22	IN7: DN300 VJ or similar approved flange adaptor for steel pipe.	No.	1		
4.5.1.23	IN8: DN300 epoxy coated and lined mild steel pipe flanged, PN16, with DN100 flanged PN10 branch. Pipe barrel 1800mm. Branch 500mm C/F end and extending 350mm C/F	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.5.1.24	IN9: DN300 epoxy coated blank flange	No.	1		
4.5.1.25	IN10: DN100 RSV gate valve flanged PN10 with non-rising spindle and handwheel	No.	2		
4.5.1.26	IN11: DN100 double acting "VENT-O-MAT" air valve or similar approved, PN16	No.	1		
4.6	**BEDDING (overflow and scour pipelines)**				
	Provision of bedding from available sources on site				
4.6.1	Selected fill material	m³	20		
	Supply only of bedding by importation (provisional)from commercial sources				
4.6.2	Selected granular material	m³	20		
4.6.3	SUBSOIL DRAINAGE (Reservoir)				
	Supply and lay (as detailed on drawing):				
4.6.3.1	Sand compacted to 100% Mod AASHTO	m³	30		
4.6.3.2	19mm crushed stone	m³	30		
4.6.3.3	200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	750		
4.6.3.4	110mm diameter class 4 slotted drainage pipe complete with all fittings. i.e. elbows, endcaps and tee connections to suit details on the drawings	m	280		
4.7	**RESERVOIR FENCING AND SITEWORKS**				
	FENCING				
4.7.1	Supply and install fencing around reservoir complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	300 000,00	300 000,00
4.7.2	Charges on profit on item 4.7.1 above	%	300 000,00		
4.7.3	**EARTHWORKS (ROADS, SUBGRADE)**				
	RESERVOIR ACCESS ROAD				
	Road-bed preparation and compaction of material				
4.7.3.1	Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	175		
4.7.4	**WEARING COURSE**				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
4.7.4.1	Import'Sibunga' wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	300		
4.8	**GABIONS AND PITCHING**				
4.8.1	Surface preparation for bedding of gabions with approved excavated material	m²	10		
4.8.2	1mx1mx2m Gabions	m³	6		
4.8.3	230mm thick reno mattress	m²	10		
4.8.4	200grm/m2 needlepunched geofabric	m²	20		
4.8.5	Construct headwall complete with 2.2m wide by 3m long stone pitched scour apron, see detail drawing and build-in DN200 PVC pipe	Sum	1		
TOTAL FOR SECTION 4 CARRIED FORWARD TO SUMMARY					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
5.1	**EARTHWORKS**				
5.1.1	Site Clearance and Removal of Topsoil				
5.1.1.1	Clear Reservoir Site	ha	0,3		
5.1.1.2	Remove topsoil to nominal depth of 150 mm and stockpile and maintain	m²	3000		
5.1.2	Bulk Excavation				
5.1.2.1	Excavate in all materials using 30t excavator fitted with 3-tyne rock bucket to bulk excavation line (equal to finished floor level of reservoir), stockpile and maintain for backfill and dispose of all material not suitable for backfill to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:2 and compacting) Extra-over Item 5.1.2.1 for excavation in :	m³	845		
5.1.2.2	Hard rock material (heavy-duty mounted hydraulic breaker)	m³	803		
	Backfilling against reservoir and landscaping on completion				
5.1.2.3	Excavate from stockpile, backfill and compact to 90% ModAASHTO against reservoir and landscape Site as directed by the Engineer and dispose of any remaining excess material	m³	400		
5.1.3	Restricted Excavation				
5.1.3.1	Excavate down to sound foundation level (as directed by the Engiineer) using 30t excavator fitted with 3-tyne rock bucket for reservoir and chambers in all materials and use for backfill or embankment or dispose	m³	500		
	Extra over item 5.1.3.1 for:				
5.1.3.2	Excavation of hard rock material using heavy-duty mounted hydraulic breaker	m³	150		
	Extra excavation for workspace				
5.1.3.3	Excavation for workspace (downwards from bulk excavation level)	m²	100		
5.1.4	Overhaul				
5.1.4.1	Extra-over items 5.1.2.1 and 5.1.3.1 and 5.1.2.3 for overhaul of spoil material to approved disposal site	m³.km	650		
	Layer works to backfill over-excavation of unsuitable material:				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.1.4.2	Supply G5 subbase, place and compact in 200mm layers under reservoir (Prov) stabilised with 3% ordinary portland cement (to create C4 material as directed by the Engineer) compacted to 98% mod AASHTO density	m³	111		
5.1.4.3	Supply G2 crusher run, place and compact in max 200mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	111		
5.1.4.4	Fill to underside reservoir floor with 15MPa/20 mass concrete where directed by the Engineer	m³	10		
5.1.5	Importing of Materials				
5.1.5.1	Import approved topsoil from commercial source (provisional)	m³	45		
5.1.5.2	Import approved 19 mm stone chips from commercial source, stockpile and place by hand on reservoir roof	m³	40		
5.1.6	Finishing				
5.1.6.1	Topsoiling	m²	250		
5.1.6.2	Grassing (plant stolons at 300mm c/c grid harvested from vicinity) and maintain until atleast 50% cover achieved	m²	250		
5.2	**PIPE EXCAVATIONS**				
	(scour and overflow drain to daylight)				
5.2.1	Excavate in all material for trenches using 30t excavator fitted with 3-tyne rock bucket and backfill and dispose of surplus and unsuitable material. Rate to include for all temporary works including trimming, shoring and dewatering where necessary.	m³	70		
	Extra over item 5.2.1 for excavation in:				
5.2.2	Hard rock material using heavy-duty mounted hydraulic breaker	m³	30		
5.3	**REINFORCED CONCRETE**				
5.3.1	FORMWORK				
	Rough vertical to degree of accuracy III				
5.3.1.1	Footings to walls (curved)	m²	35		
5.3.1.2	Walls outside below ground level (curved)	m²	130		
5.3.1.3	Sump & encasement to pipes	m²	28		
5.3.1.4	Chambers	m²	25		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	Smooth vertical to degree of accuracy II				
5.3.1.5	Walls inside & outside above ground level (curved)	m²	725		
5.3.1.6	Column bases	m²	30		
5.3.1.7	Footing at expansion joint	m²	15		
5.3.1.8	Circular Columns	m²	84		
5.3.1.9	Roof slab & upstand	m²	40		
5.3.1.10	Sump	m²	20		
5.3.1.11	Chamber cover slab	m²	3		
5.3.1.12	Chambers	m²	5		
	Smooth horizontal to degree of accuracy II				
5.3.1.13	Roof soffit	m²	315		
5.3.1.14	Chambers	m²	20		
	Box-outs for pipe specials to be installed then grouted in place:				
	1) Box-out in outer chamber wall to accommodate:				
5.3.1.15	a) DN350 inlet pipe	No.	1		
5.3.1.16	b) DN200 overflow/scour drain pipe	No.	1		
5.3.1.17	c) DN200 outlet pipe	No.	1		
5.3.1.18	d) DN100 outlet pipe	No.	1		
	2) Grout specials in place				
5.3.1.19	a) DN350 inlet pipe	No.	1		
5.3.1.20	b) DN200 overflow / scour pipe	No.	1		
5.3.1.21	c) DN200 outlet pipe	No.	1		
5.3.1.22	d) DN100 outlet pipe	No.	1		
	3) Box-out in reservoir roof to accommodate:				
5.3.1.23	b) DN100 holes for sampling equipment	No.	2		
5.3.1.24	c) DN200 air vents	No.	4		
5.3.1.25	d) DN150 roof drainage outlets	No.	18		
5.3.2	REINFORCEMENT				
	Mild steel bars				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.3.2.1	All sizes	t	6,4		
	High-tensile steel bars				
5.3.2.2	All sizes	t	64		
	High-Tensile Welded Mesh				
5.3.2.3	Type reference #245	m²	74		
5.3.2.4	Type reference #193	m²	61		
5.3.3	CONCRETE				
5.3.3.1	75mm No-fines concrete under floor complete with smooth dry-mix plaster scratch-coat on surface	m³	170		
	Blinding Layer to chambers and conc encasements (Grade 15/19 MPa)				
5.3.3.2	50mm blinding layer	m³	30		
	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
5.3.3.3	Walls above footing	m³	125		
5.3.3.4	Footings to walls	m³	46		
5.3.3.5	Floor slabs	m³	80		
5.3.3.6	Roof slab & upstand	m³	90		
5.3.3.7	Columns with bases	m³	18		
5.3.3.8	Encasement to inlet / outlet / overflow / scour pipes and sump	m³	25		
5.3.3.9	Inlet & outlet chambers	m³	36		
	Strength concrete: 15 MPa/19 mm				
5.3.3.10	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	2		
5.3.3.11	Mass concrete including splash aprons from roof overflow, v-drain and filling under reservoir footings (where ordered by the Engineer)	m³	20		
	Strength 25MPa/19mm concrete				
5.3.3.12	25MPa/19mm concrete to benching	m³	5		
5.3.4	UNFORMED SURFACE FINISHES				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	(a) Wood-floated finish (to degree of accuracy II)				
5.3.4.1	Top of reservoir wall footing (outside)	m²	28		
5.3.4.2	Reservoir roof	m²	330		
5.3.4.3	Invert to reservoir sump	m²	4		
5.3.4.4	Top of upstand	m²	10		
	(b) Steel-floated (to degree of accuracy II)				
5.3.4.5	Top of reservoir Wall	m²	20		
5.3.4.6	Top Reservoir Floor Slab & Footing inside	m²	318		
5.3.4.7	Top of column Bases	m²	24		
5.3.5	JOINTS				
	NOTE: Flexible bandages over floor joints to be carried out by approved Specialist Subcontractor.				
5.3.5.1	Allowance for Specialist Subcontractor to supply & install flexible bandage jointing	PC Sum	1	100 000,00	100 000,00
5.3.5.2	Overheads, Charges and profit on item 2.2.3.1 above	%	100 000,00		
5.3.5.3	1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with 250mm rearguard waterstop and 15mm Closed cell Polyethylene 100kg/m or closed cell high density void formeras per detail on drawings	m	65		
5.3.5.4	2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with 250mm rearguard waterstop with centre bulb	m	41		
5.3.5.5	3) Horizontal construction joints in reservoir walls (as per drawings) measured by the total length of construction joints complete with 150mm wide by 1.6mm thick galvanised mild steel strips waterstop and 150mm wide Lanko Bandage or similar approved	m	64		
5.3.5.6	4) Isolation Joints in reservoir external perimeter slab (as per drawings)	m	135		
5.3.6	MISCELLANEOUS CONCRETE ITEMS				
5.3.6.1	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	64		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.3.6.2	Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	66		
5.3.6.3	Concrete planks to reservoir over outlet manhole to reservoir.	No	4		
5.3.6.4	Cast in situ standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around resevoir perimeter (see standard detail drg). Mesh ref 245 measured elsewhere	m	70		
5.3.6.5	200gm/m2 needle punched geotextile (1m width)	m²	70		
5.3.6.6	Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
5.3.6.7	150mm dia glvanised outlets, cut from a 150mm dia pipe with metal guaze vermin proof (GALVANISED AFTER FABRICATION) as per detail on the drawings (300mm long)	No	18		
	Manhole items				
5.3.6.8	Concrete cover planks without manhole,including lifting hooks and air vents.	No	1		
5.3.6.9	Concrete cover plank complete with manhole frame cast in, including lifting hooks. Note payment of cast iron manhole frame and cover paid seperately	No	1		
5.3.6.10	Manhole cover (to SABS 558) type 9E with frame	No	1		
	WATER TIGHTNESS TESTING - NOTE: Water is unliklely to be available until near the end of the Defects Liability Period. The Employer and Employer's Agent will carry out the test and advise if repairs are required.				
5.3.6.11	Cleaning and sterilizing reservoir and associated pipework ready to fill with water for testing immediately prior to Practical Completion Inspection	Sum	1		
5.3.7	DRY-STACK CONCRETE BLOCK RETAINING WALLS				
	Dry-Stack Retaining Block Foundations				
	Note: Restricted excavation, reinforcement and concrete measured under reservoir items				
	Construct dry-laid precast concrete block wall using Loffelstein blocks at 63°				
	Design, supply and installation of dry-laid precast concrete block retaining wall for heights as follows:				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.3.7.1	a) over 0m up to and including 3m	m²	40		
5.4	**STRUCTURAL STEELWORK**				
	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
	Access ladders with cage				
5.4.1	Internal 4m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
5.4.2	External 3.2m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
5.4.3	2m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
	Reservoir and Chambers' roof elements				
5.4.4	Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	1		
5.4.5	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	Air Vents				
5.4.6	GMS DN200 reservoir ventilators as per detail on drawings	No	4		
5.5	**PIPEWORK**				
	SPECIALS AND FITTINGS				
	Supply, handle, install and commission complete with couplings and GMS nuts and bolts and corrosion protection (all bolted connections to coated with Tectile mastic and bandaged with petrolatum saturated textile (Denso or equivalent). All pipework to be FBE coated and lined mild steel (min 300 micron DFT), 4mm wall thickness.				
5.5.1	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	OVERFLOW & SCOUR DRAINAGE PIPELINES				
5.5.1.1	200mm diameter uPVC Class 34 Heavy Duty Drainage Pipe	m	100		
	OUTLET				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.5.1.2	O1: DN300 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end . 1100mm C/F other end 2900mm C/F	No.	1		
5.5.1.3	O2: DN300 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
5.5.1.4	O3: DN300 VJ or similar approved flange adaptor for steel pipe	No.	1		
5.5.1.5	O4: DN300 epoxy coated and lined mild steel PN16, one end flanged and other plain, 200mm long.	No.	1		
5.5.1.6	O5: DN300 Electro Magnetic flow meter (Endress Hauser or similar approved)	No.	1		
5.5.1.7	O6: DN100 Double acting "VENT-O-MAT" air valve or similar approved, PN16	No.	1		
5.5.1.8	O7: DN100 RSV gate valve flanged PN16 with non-rising spindle and handwheel	No.	1		
5.5.1.9	O8: DN300 epoxy coated and lined mild steel pipe flanged, PN16, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm long. Branch to be located 500mm C/F and extending 350mm C/F.	No.	1		
5.5.1.10	O9: DN300 epoxy coated blank flange	No.	1		
	OVERFLOW				
5.5.1.11	OV1: DN300 epoxy coated and lined mild steel pipe, buttressed flanged PN16 one end and DN450 bellmouth with 4 No. anti-vortex baffles the other end. 3250mm F/BELLMOUTH.	No.	1		
5.5.1.12	OV2: DN300 epoxy coated and lined mild steel 90° bend. Buttressed flanged PN16 one end and plain ended the other. 1250mm c/f and 3000mm c/plain end.	No.	1		
	SCOUR				
5.5.1.13	S1: DN200 epoxy coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 11300mm c/f.	No.	1		
5.5.1.14	S2: DN200 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
5.5.1.15	S3: DN200 Rilsan coated and lined mild steel short radius 90° bend. Flanged PN10 one end and plain ended the other end with standard c/f dimensions.	No.	1		
	INLET				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.5.1.16	IN1: DN300 epoxy coated and lined mild short radius 90° bend. Flanged, PN16, one end. 1100mm C/F other end 2900mm C/F.	No.	1		
5.5.1.17	IN2: DN300 x DN200 epoxy coated and lined mild steel reducer, flanged PN16 both ends, 400mm long.	No.	2		
5.5.1.18	IN3: DN200 PN16 flanged Bermad 9or similar approved) pressure-sustaining and non-modulating float control valve	No.	1		
5.5.1.19	IN4: DN200 x DN200mm long flanged epoxy coated and lined muild steel pipe.	No.	2		
5.5.1.20	IN5: DN200 Battery-powered Electro magnetic flow meter (Endress Hauser or similar approved) complete with stainless steel grounding rings linked to earthing spike in the ground outside.	No.	1		
5.5.1.21	IN6: DN300 PN16 flanged double off-set butterfly valve with gearbox and handwheel	No.	1		
5.5.1.22	IN7: DN300 VJ or similar approved flange adaptor for steel pipe.	No.	1		
5.5.1.23	IN8: DN300 epoxy coated and lined mild steel pipe flanged, PN16, with DN100 flanged PN10 branch. Pipe barrel 1800mm. Branch 500mm C/F end and extending 350mm C/F	No.	1		
5.5.1.24	IN9: DN300 epoxy coated blank flange	No.	1		
5.5.1.25	IN10: DN100 RSV gate valve flanged PN10 with non-rising spindle and handwheel	No.	2		
5.5.1.26	IN11: DN100 double acting "VENT-O-MAT" air valve or similar approved, PN16	No.	1		
5.5.1.27	IN12: DN300 MARIC flow-control disk (960 l/m) (obtained from specialist supplier)	PC Sum	1	60 000,00	60 000,00
5.5.1.28	Mark-up on item5.5.1.27 for profit & charges and installation between flanges	%	60 000,00		
5.6	**BEDDING (overflow and scour pipelines)**				
	Provision of bedding from available sources on site				
5.6.1	Selected fill material	m³	20		
	Supply only of bedding by importation (provisional)from commercial sources				
5.6.2	Selected granular material	m³	20		
5.6.3	SUBSOIL DRAINAGE (Reservoir)				
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	Supply and lay (as detailed on drawing):				
5.6.3.1	Sand compacted to 100% Mod AASHTO	m³	30		
5.6.3.2	19mm crushed stone	m³	20		
5.6.3.3	200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	350		
5.6.3.4	110mm diameter class 4 slotted drainage pipe complete with all fittings. i.e. elbows, endcaps and tee connections to suit details on the drawings	m	175		
5.6.4	OVERFLOW & SCOUR DRAINAGE PIPELINES				
5.6.4.1	300mm diameter uPVC Class 34 Heavy Duty Drainage Pipe	m	100		
5.7	**RESERVOIR FENCING AND SITEWORKS**				
	FENCING				
5.7.1	Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	300 000,00	300 000,00
5.7.2	Charges on profit on item 5.7.1 above	%	300 000,00		
5.7.3	**EARTHWORKS (ROADS, SUBGRADE)**				
	RESERVOIR ACCESS ROAD				
	Road-bed preparation and compaction of material				
5.7.3.1	Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	175		
5.7.4	**WEARING COURSE**				
5.7.4.1	Import 'Sibunga' wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	300		
5.7.5	**GABIONS AND PITCHING**				
5.7.5.1	Surface preparation for bedding of gabions with approved excavated material	m²	10		
5.7.5.2	1mx1mx2m Gabions	m³	6		
5.7.5.3	230mm thick reno mattress	m²	10		
5.7.5.4	200grm/m2 needlepunched geofabric	m²	20		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5.7.5.5	Construct headwall complete with 2.2m wide by 3m long stone pitched scour apron, see detail drawing and build-in DN200 PVC pipe	Sum	1		
TOTAL FOR SECTION 5 CARRIED FORWARD TO SUMMARY					