Project No: ORTDM SCMU 27-20/21

OR TAMBO DISTRICT MUNICIPALITY
MQANDULI SECONDARY BULK WATER SCHEME PHASE 2 – CONTRACT 5

29 January 2021

ADDENDUM No. 1

NOTICE TO TENDERERS

Tenderers for the abovementioned Contract are hereby notified as follows:
PLEASE ACKNOWLEDGE RECEIPT OF THIS ADDENDUM AS FOLLOWS:

1. Complete the attached acknowledgement of receipt and submit the completed form with your tender as part of the returnables (Section T2.2, Form CC).

2. No Addendums will be issued within (5) working days on the close of Tender.

Failure to acknowledge receipt of this Addendum by attaching it to the returnables may prejudice your Tender.

THIS ACKNOWLEDGEMENT OF RECEIPT OF ADDENDUM MUST BE SUBMITTED TOGETHER WITH THE TENDER DOCUMENT

OR Tambo District Municipality
OR Tambo House
Nelson Mandela Drive
Myezo Park
Mthatha
5100

Sir/Madam

Project No: ORTDM SCMU 27-20/21

MQANDULI SECONDARY BULK WATER SCHEME PHASE 2 – CONTRACT 5

ADDENDUM No. 1 (ONE)

I/We herewith acknowledge receipt of Addendum No 1 (One) for the above-mentioned Tender.

.....

SIGNATURE

.....

COMPANY

.....

DATE

ADDENDUM NO. 1

1. BILL OF QUANTITIES

Attached is the **revised** Bill of Quantities which supersedes the Bill of Quantities in the Tender Document.

The attached Bill of Quantities must be completed and submitted with the Tender.

2. DRAWINGS

Attached is the **revised** drawing (**DRG No.: ZCE063/FT/WA/C5/311 - Rev 1**) which supersedes the drawing (DRG No.: ZCE063/FT/WA/C5/311 - Rev 0) included in the Tender Document

SECTION 1 : SABS 1200 A - GENERAL

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
1.1	8.3	FIXED-CHARGE AND VALUE RELATED ITEMS				
1.1.1	8.3.1	Contractual Requirements	Sum	1		
	8.3.2	Establishment of Facilities on the Site				
	8.3.2.1	Facilities for Engineer				
1.1.2	PSAB 3.2	a) Furnished offices (1No.)	Sum	1		
1.1.3		b) Telephone	Sum	1		
1.1.4		c) Nameboards (2 No.)	Sum	1		
	8.3.2.2	Facilities for Contractor				
1.1.5		a) Offices and storage sheds	Sum	1		
1.1.6		b) Workshops	Sum	1		
1.1.7		c) Laboratories	Sum	1		
1.1.8		d) Living accommodation	Sum	1		
1.1.9		e) Ablution and latrine facilities	Sum	1		
1.1.10		f) Tools and equipment	Sum	1		
1.1.11		g) Water supplies, electric power and communications	Sum	1		
1.1.12		h) Dealing with water (see 5.5)	Sum	1		
1.1.13		i) Access (see 5.8)	Sum	1		
1.1.14		j) Plant	Sum	1		
1.1.15	8.3.3	Other Fixed-charge Obligations	Sum	1		
1.1.16	8.3.4	Removal of Site Establishment	Sum	1		
1.1.17	PSA 8.3.5	Provision of a Materials Guarantee	Sum	1		
	PSA 8.4.6	Compliance with the OHS Act (1993, as amended), the Construction Regulations (2014) and the Particular Safety Specification:				
1.1.18	PSHSS 6.1.2; CR 5 (1)(l)	i) Preparation of the Contractor's site specific Health and Safety Plan	Sum	1		
1.1.19	CR 7(1)(b)	ii) Principal Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations	Sum	1		
	GSR 2; PSHSS 7.7	iii) Provision of SABS Personal Protective Equipment				
1.1.20		(a) Hard Hats	No	30		
1.1.21		(b) Reflective vests	No	30		
1.1.22		(c) Protective foot wear	No	30		
1.1.23		(d) Corded Earplugs	No	0		
1.1.24		(e) Dust masks FFP2	No	200		
1.1.25		(g) Gloves	No	50		
1.1.26		(h) Goggles	No	50		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
	CR 7(1)(g);	iv) Cost of medical certificates and medical surveillance				
1.1.27	PSHSS 7.2	(a) Initial (baseline) medical examinations	No	30		
1.1.28		(b) Exit medical examinations	No	30		
	PSHSS 7.14	v) Fall Protection				
1.1.29		a) Lifeline & anchorage	No	2		
1.1.30		b) Safety Harnesses	No	5		
1.1.31		c) Rescue Kit	No	1		
		vi) Occupational Hygiene Survey				
1.1.32	NIHL 6; PSHSS 7.3	(a) Establishment of noise zones (plant)	Sum	1		
1.1.33		(b) Compliance with Amendment of the Occupational Exposure Control Limit for Silica in Table 1 of the Hazardous Chemical Substances including air sampling and analysis	Sum	1		
1.1.34	PSA 8.4.7	Compliance with EMP and EMPr	Sum	1		
1.2	8.4	TIME-RELATED ITEMS				
1.2.1	8.4.1	Contractual Requirements		1		
	8.4.2	Operation and Maintenance of Facilities on Site, for Duration of Construction, except where otherwise stated				
	8.4.2.1	Facilities for Engineer				
1.2.2		a) Furnished offices (1No.)		1		
1.2.3	PSAB 8.4.1	b) Telephone	Sum	1		
1.2.4		c) Nameboards (2 No.)	Sum	1		
1.2.5		d) Survey assistants and materials	Sum	1		
	8.4.2.2	Facilities for Contractor				
1.2.6		a) Offices and storage sheds	Sum	1		
1.2.7		b) Workshops	Sum	1		
1.2.8		c) Laboratories	Sum	1		
1.2.9		d) Living accommodation	Sum	1		
1.2.10		e) Ablution and latrine facilities	Sum	1		
1.2.11		f) Tools and equipment	Sum	1		
1.2.12		g) Water supplies, electric power and communications	Sum	1		
1.2.13		h) Dealing with water (see 5.5)	Sum	1		
1.2.14		i) Access (see 5.8)	Sum	1		
1.2.15		j) Plant	Sum	1		
1.2.16	8.4.3	Supervision for Duration of Construction	Sum	1		
CARRIED FORWARD						

SECTION 1 : SABS 1200 A - GENERAL

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
1.2.17	8.4.5	Other Time-related Obligations	Sum	1		
	PSA 8.4.6	Compliance with the OHS Act (1993, as amended), the Construction Regulations (2014) and the Particular Safety Specification:				
1.2.18	CR 5(1)(g)	i) Principal Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations	month	14		
1.2.19	CR 8(5); PSHSS 6.1.5	ii) Provision of a full- time SACPCMP registered Construction Health and Safety Officer	month	14		
1.2.20		iii) Provision of a part-time assistant SACPCMP Candidate Construction Health and Safety Officer for Subcontractor Management & Assistance	month	14		
		iv) OH&S Legal Compliance Training - SAQA UNIT STANDARD				
1.2.21	GSR 3(5); PSHSS 7.5	a) First Aid	No	1		
1.2.22	PSHSS 6.1.7	b) H&S Representative	No	1		
1.2.23	PSHSS 7.14	c) Working at height & rescue operations	No	20		
1.2.24	CR 29(h)	d) Basic Fire Fighting	No	1		
1.2.25	PSHSS 6.1.3/4	e) Safety for Supervisors	No	2		
1.2.26	PSHSS 7.13	f) Temporary Works Training	No	20		
1.2.27	SANS 10085; PSHSS 7.13	g) Scaffolding	No	5		
1.2.28	PSHSS 7.10	h) Plant Operators	No	5		
1.2.29	PSHSS 6.1.6	i) Temporary Roadworks Signage	Sum	1		
1.2.30	PSHSS 7.17	j) Excavation Safety - Supervisors	No	12		
1.2.31		k) Other	Sum	1		
1.2.32	GSR 3; PSHSS 7.5	v) Provision of First Aid Boxes to GSR requirements	No	3		
1.2.33	GMR 18; PSHSS 7.13	vi) Lifting Equipment Inspection by AIA	Sum	1		
1.2.34	PSHSS 7.13	vii) Temporary Works Designs, Inspections and Approval	Sum	1		
1.2.35	CR 7(1)(c)(e)	viii) Submission of a Health and Safety File	Sum	1		
1.2.36	PSA 8.4.7	Compliance with EMP and EMPr	Sum	1		
1.2.37	PSA 8.4.8	Supervision of Subcontractor	Sum	1		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
1.3	8.5	SUMS STATED PROVISIONALLY BY ENGINEER (Subclause 8.1.2.1 (d))				
1.3.1		Community Liason Officer	Prov. Sum	1	75 000.00	75 000.00
1.3.2		Overheads, charges and profit on 1.3.1 above	%	75000		
1.3.3		Additional Tests required by Engineer	Prov. Sum	1	150 000.00	150 000.00
1.3.4		Overheads, charges and profit on 1.3.3 above	%	150000		
1.3.5		Allowance for additional survey	Prov. Sum	1	120 000.00	120 000.00
1.3.6		Overheads, charges and profit on 1.3.5 above	%	120000		
1.3.7		Allowance for relocation of existing services	Prov. Sum	1	100 000.00	100 000.00
1.3.8		Overheads, charges and profit on 1.3.7 above	%	100000		
1.3.9		Allowance for connections to existing infrastructure	Prov. Sum	1	50 000.00	50 000.00
1.3.10		Overheads, charges and profit on 1.3.9 above	%	50000		
1.3.11		Allowance for River Crossings	Prov. Sum	1	250 000.00	250 000.00
1.3.12		Overheads, charges and profit on 1.3.11 above	%	250000		
1.3.13		Allowance for lightning protection at Reservoir	Prov. Sum	1	50 000.00	50 000.00
1.3.14		Overheads, charges and profit on 1.3.13 above	%	50000		
1.3.15		Allowance for HIV awareness and training	Prov. Sum	1	10 000.00	10 000.00
1.3.16		Overheads, charges and profit on 1.3.15 above	%	10000		
		Expanded Public Works Programme (EPWP)				
1.3.17		Allowance for training on targeted labour	Prov. Sum	1	150 000.00	150 000.00
1.3.18		Overheads, charges and profit on 1.3.17 above	%	150000		
1.3.19		Transportation and accomodation of workers for training where it is not possible to undertake in close proximity	Prov. Sum	1	15 000.00	15 000.00
1.3.20		Overheads, charges and profit on 1.3.19 above	%	15000		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
1.3.21		Allowance for the supply of safety apparel (safety boots, reflectors, vests, orange overalls bearing the EPWP logo and large EPWP logo on the back and safety gloves for all targeted labour)	Prov. Sum	1	20 000.00	20 000.00
1.3.22		Overheads, charges and profit on 1.3.21 above	%	20000		
1.3.23		Equipment for the Engineer	Prov. Sum	1	125 000.00	125 000.00
1.3.24		Overheads, Charges and Profit on item 1.3.23 above	%	125000		
1.3.25		Allowance for Civil Engineering Student / Trainee	Prov. Sum	1	96 000.00	96 000.00
1.3.26		Overheads, Charges and Profit on item 1.3.25 above	%	96000		
1.3.27		Training of SMME Contractors	Prov. Sum	1	200 000.00	200 000.00
1.3.28		Overheads, Charges and Profit on item 1.3.27 above	%	200000		
1.3.29		Transportation for the Engineer for the duration of the contract (R45000 pm).	Prov. Sum	1	630 000.00	630 000.00
1.3.30		Overheads, Charges and Profit on item 1.3.29 above	%	630000		
1.3.31		Cellphone allowance for the Engineer for the duration of the contract (R5000 pm).	Prov. Sum	1	75 000.00	75 000.00
1.3.32		Overheads, Charges and Profit on item 1.3.31 above	%	75000		
	PSA 8.7	DAYWORK (See 8.1.2.1 (d))				
1.3.33		a) Labour	Prov. Sum	1	250 000.00	250 000.00
1.3.34		Overheads, charges and profit on item 1.3.33 above	%	250000		
1.3.35		b) Materials	Prov. Sum	1	300 000.00	300 000.00
1.3.36		Overheads, charges and profit on item 1.3.35 above	%	300000		
1.3.37		c) Plant	Prov. Sum	1	300 000.00	300 000.00
1.3.38		Overheads, charges and profit on item 1.3.38 above	%	300000		
1.4	8.8	TEMPORARY WORKS (See 8.1.2.1 (d))				
1.4.1	8.8.1	Main Access Road to Works (construct and maintain)	Sum	1		
1.4.2	PSA 8.8.2	Dealing with traffic	Sum	1		
1.4.3	PSA 8.8.7	Contractor to provide "Construction Record" Information	Sum	1		
TOTAL FOR SECTION 1 CARRIED FORWARD TO SUMMARY						

SECTION 2 : SABS 1200 C - SITE CLEARANCE (PIPE ROUTE)

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	8.2.1	Clear and grub				
2.1		(i) Pipeline route (10m wide strip)	m	8850		
	8.2.2	Remove and grub large trees and tree stumps of girth				
2.2		a) over 1 m and up to 2 m	No.	5		
2.3		b) over 2 m and up to 3 m	No.	5		
2.4	8.2.3	Remove and grub all trees and tree stumps regardless of girth	ha	0.25		
2.5	8.2.4	Reclear surfaces (only on instructions from Engineer)	m	200		
2.6	PSC 8.2.5	Take down existing fences	km	1		
	8.2.6	Clear hedge or fence or both where not scheduled separately				
2.7		(i) Hedges up to 2m high	m	100		
2.8		(ii) Reinstate Hedge	m	100		
TOTAL FOR SECTION 2 CARRIED FORWARD TO SUMMARY						

SECTION 3 : SABS 1200 D - EARTHWORKS (PIPE ROUTE)

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	8.3.3	Ristricted Excavation:				
3.1		Excavate at break pressure tank site in all materials, and use for backfill or embankment, or dispose	m²	0.6		
	8.3.8	Existing Services				
	8.3.8.1	Location				
3.2		c) Excavate by hand in soft material to expose water / telkom / electrical service (LI)	m³	100		
	8.3.10	Topsoiling				
3.3		(i) Pipeline Route	m²	44375		
	8.3.11	Grassing or Vegetation Cover				
3.4		(i) Pipeline Route	m²	44375		
3.5	PSD 8.3.13	Erosion Control Berms	m²	100		
3.6	PSD 8.3.14	Sandbag Protection to pipe trench	No.	100		
3.7	PSD 8.3.15	Extra-over Sandbag Protection for Stabilization	No.	100		
TOTAL FOR SECTION 3 CARRIED FORWARD TO SUMMARY						

SECTION 4 : SABS 1200 DB - PIPE TRENCHES

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	8.3.1	Site Clearance and (if specified) Removal of Topsoil				
	PSDB 8.3.1.C	c) Remove Topsoil				
4.1		(i) 150mm (up to 5m wide strip)	m²	70995		
	8.3.2	Excavation				
		a) Excavate in all materials for trenches, backfill, compact, and dispose of surplus material				
		For pipes:				
		Up to and including 400mm diam. for total trench depth:				
4.2		Over 0 and up to 1m (LI)	m	140		
4.3		Over 1m and up to 2m	m	8670		
4.4		Over 2m and up to 3m	m	130		
		b) Extra-over item (a) above for:				
4.5		2) Hard rock excavation	m³	295		
4.6		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	70		
4.7		c) Excavate and dispose of unsuitable material from trench bottom (provisional)	m³	365		
4.8	8.3.2(b)	Excavate and dispose of unsuitable material from trench bottom within a 1km radius freehaul (Provisional)	m³	90		
	8.3.3	Excavation Ancillaries				
	8.3.3.1	Make up deficiency in backfill material (provisional)				
4.9		a) from other necessary excavations on site	m³	285		
4.10		c) by importation from commercial or off site sources selected by the Contractor	m³	285		
4.11	PSDB 8.3.3.1	d) stabilised backfill	m³	100		
4.12	PSDB 8.3.3.4	Overhaul				
4.13		a) Limited Overhaul (provisional)	m³	500		
4.14		b) Long Overhaul (provisional)	m³.km	500		
	8.3.4	Particular Items				
		a) Shore trench opposite structure or service				
4.15		(i) Existing houses and toilet structures	m	100		
	8.3.5	Existing Services that Intersect or Adjoin a Pipe Trench				
		a) Services that intersect a trench				
CARRIED FORWARD						

SECTION 4 : SABS 1200 DB - PIPE TRENCHES

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
4.16		i) Concrete pipe up to 1000 mm dia.	No.	5		
4.17		ii) Water pipe up to 400 mm dia.	No.	7		
4.18		iii) Electrical Cables	No.	7		
		b) Services that adjoin a trench				
4.19		i) Water pipe up to 400 mm dia.	m	100		
4.20		ii) Telkom Cables	m	20		
4.21		ii) Electrical Cables	m	20		
	8.3.6	Finishing				
	8.3.6.1	Reinstate road surfaces complete with all courses				
4.22		a) Gravel on shoulders and wearing course	m²	40		
TOTAL FOR SECTION 4 CARRIED FORWARD TO SUMMARY						

SECTION 5 : SABS 1200 DK - GABIONS AND PITCHING

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	8.2.1	Surface preparation for bedding of gabions				
5.1		a) Cavities filled with approved excavated or rock (LI)	m²	20		
5.2		b) Cavities filled with grade 15 concrete (provisional)	m²	10		
	8.2.2	Gabions				
		Gabions (PVC Coated)				
5.3		1.0 m x 1.0 m x 1.0 m	m³	4		
5.4		1.0 m x 1.0 m x 4.0 m				
		Foundation Mattresses (PVC Coated)				
5.5		0.23 m x 2.0 m x 6.0 m	m³	6		
5.6	8.2.3	Extra-over item 8.2.2 for packing selected stone for exposed face	m²	20		
	8.2.4	Geotextile (or geomembrane) - Type A2				
5.7		(i) For gabions	m²	60		
5.8		(ii) For crushed stone bedding and sub-soil drains	m²	10		
	8.2.5	Pitching				
5.9		Grouted stone pitching	m²	15		
TOTAL FOR SECTION 5 CARRIED FORWARD TO SUMMARY						

SECTION 6 : SABS 1200 L - MEDIUM-PRESSURE PIPELINES

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	8.2.1	Supply, Lay and Bed Pipes Complete with Couplings				
		110 Diameter Pipes				
6.1		(i) 110mm diam. mPVC CL25 to SABS 966-2	m	460		
6.2		(ii) 110mm diam. mPVC CL20 to SABS 966 -2	m	840		
6.3		(iii) 110mm diam. mPVC CL16 to SABS 966-2	m	1365		
6.4		(iv) 110mm diam. mPVC CL12 to SABS 966-2	m	4155		
	8.2.2	Extra-over 8.2.1 for the Supplying, Laying and Bedding of Specials Complete with Couplings				
		mPVC Double Socketed Bends CL16				
		110 Diameter Pipe Bends				
6.5		(i) 110 mm Ø 11¼° bend	No.	27		
6.6		(ii) 110 mm Ø 22½° bend	No.	9		
		mPVC Double Socketed Bends CL25				
		110 Diameter Pipe Bends				
6.7		(i) 110 mm Ø 11¼° bend	No.	10		
6.8		(ii) 110 mm Ø 22½° bend	No.	11		
6.9		(iii) 110 mm Ø 45° bend	No.	1		
		Fittings CL16				
6.10		(i) 110 Ø Equal Tee	No.	1		
	8.2.3	Extra-over 8.2.1 for the Supplying, Fixing, and Bedding of Valves				
		Isolating Valve assembly complete as per detail on drawing no. ZCE063/FT/WA/C5-304				
6.11		i) 110 mm Ø ND, PN16	No.	7		
6.12		ii) 75 mm Ø ND, PN16	No.	1		
		Scour Valve assembly complete as per detail on drawing no. ZCE063/FT/WA/C5-307				
6.13		(i) 80 mm Ø ND off 110 mm Ø OD mPVC pipe, PN 16	No.	5		
6.14		(ii) 80 mm Ø ND off 110 mm Ø OD mPVC pipe, PN 25	No.	1		
		Air Valve assembly complete as per detail on drawing no. ZCE063/FT/WA/C5-306				
6.15		(i) 25 mm Ø ND off 50 mm Ø OD mPVC pipe, PN 16	No.	3		
CARRIED FORWARD						

SECTION 6 : SABS 1200 L - MEDIUM-PRESSURE PIPELINES

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
6.16		(ii) 25 mm Ø ND off 110 mm Ø OD mPVC pipe, PN 16	No.	1		
6.17		(iii) 50 mm Ø ND off 110 mm Ø OD mPVC pipe, PN 16	No.	2		
6.18		(iv) 80 mm Ø ND off 110 mm Ø OD mPVC pipe, PN 16	No.	4		
6.19		(v) 25 mm Ø ND off 110 mm Ø OD mPVC pipe, PN 25	No.	4		
		Inlet chamber assembly complete as per drawing no. ZCE063/FT/WA/C5-310				
6.20		i) 110 mm Ø ND, PN16	No	1		
6.21		i) 110 mm Ø ND, PN25	No	1		
6.22		LW Systems Break pressure tanks (or similar approved) complete as shown on drawing No. ZCE063/FT/WA/C5-318:				
6.23		a) LW systems Break pressure tanks model 03LW10 (or similar approved)	No.	1		
	8.2.11	Anchor / Thrust Blocks and Pedestals as per drawing no. ZCE063/FT/WA/C5-301				
6.24		a) Dimensions stated on Drawing mentioned above	Sum	1		
	8.2.13	Valves and Hydrant Chambers etc				
6.25		Isolating Valve Chamber complete as per detail on drawing no. ZCE063/FT/WA/C5-304	No.	8		
6.26		Scour Valve Chambers complete as per detail on drawing no. ZCE063/FT/WA/C5-307	No.	5		
6.27		Air Valve Chambers complete as per detail on drawing no. ZCE063/FT/WA/C5-306	No.	14		
6.28		Inlet Chamber complete as per detail on drawing no. ZCE063/FT/WA/C5-310	No.	2		
6.29		BPT chamber complete as per drawing no. ZCE039/FT/WA/C5-318	No.	1		
6.30	PSL 8.2.16	Supply and install pipeline markers as per detail on drawing no. ZCE063/FT/WA/C5-303	No.	178		
6.31	PSL 8.2.17	Supply and install valve markers as per detail on drawing no. ZCE063/FT/WA/C5-303	No.	31		
		Sundry Items				
		Supply, lay, bed and install concrete pipe sleeves for road crossings, inclusive of all items (viz. skids etc) necessary for pipe support through sleeve as per drawing No... Class 100D, Spigot and Socket type as per drawing no. ZCE063/FT/WA/C5-309 for:				
CARRIED FORWARD						

SECTION 6 : SABS 1200 L - MEDIUM-PRESSURE PIPELINES

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
6.32		(i) 600 mm ND Concrete Sleeve for 400 mm ND mPVC pipe	m	10		
6.33		(ii) 600 mm ND Concrete Sleeve for 215 mm ND mPVC pipe	m	10		
6.34		(iii) 600 mm ND Concrete Sleeve for 200 mm ND mPVC pipe	m	10		
6.35	PSL 8.2.18	Tie in to existing pipelines, chambers & reservoirs	Sum	1		
TOTAL FOR SECTION 6 CARRIED FORWARD TO SUMMARY						

SECTION 7 : SABS 1200 LB - BEDDING: (PIPES)

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	8.2.1	Supply only of Bedding from Trench Excavation within 0.5km				
7.1		a) Selected granular material	m³	284		
7.2		b) Selected fill material	m³	200		
	8.2.2	Supply only of Bedding by Importation				
	8.2.2.3	From commercial sources (Provisional)				
7.3		a) Selected granular material	m³	1136		
7.4		b) Selected fill material	m³	793		
7.5		c) 19mm graded crushed stone	m³	5		
7.6	8.2.3	Concrete Bedding Cradle	m³	10		
	8.2.4	Encasing of Pipes in Concrete				
7.7		(i) Grade 25 MPa / 19 mm concrete	m³	15		
7.8	8.2.5	Overhaul of Material for Bedding Cradle and Selected Fill Blanket	m³.km	3000		
TOTAL FOR SECTION 7 CARRIED FORWARD TO SUMMARY						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
8.1	SANS 1200D	EARTHWORKS				
		Site Clearance and Removal of Topsoil				
8.1.1	8.3.1	Prepare Reservoir Site	ha	0.2		
8.1.2	8.3.1.2	Remove topsoil to nominal depth of 150 mm and stockpile or dispose	m²	1250		
8.1.3	SANS 1200C 8.2.9 PSC3.1 PSD 8.3.6	Transport and dispose of materials to suitable dumping site	m³.km	1000		
8.2	SANS 1200D	EXCAVATION				
8.2.1	8.3.2	Bulk Excavation				
8.2.1.1	8.3.2(a) PSD 8.3.2	Excavate in all materials to bulk excavation line (that is about 100mm above the Final Excavation Level), stockpile and maintain for backfill and dispose of remainder to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:3 and compacting)	m³	2500		
	8.3.2(b)	Extra-over Item 3.2.1.1 for excavation in :				
8.2.1.2		1) Intermediate material	m³	450		
8.2.1.3		2) Hard rock material (blasting)	m³	750		
8.2.1.4		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	100		
8.2.1.5		4) Boulder material class A	m³	175		
8.2.1.6		5) Boulder material class B	m³	175		
8.2.2	8.3.4	Importing of Materials				
8.2.2.1	8.3.4(a)	Import approved topsoil from commercial source (provisional)	m³	30		
8.2.2.2		Import approved 25 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	30		
	8.3.4(a)	Layer works To backfill over-excavation of unsuitable material:				
8.2.2.3		Supply G2 crusher run, place and compact in max 150mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	90		
8.2.2.4		Supply G5 subbase, place and compact in 150mm 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	270		
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.2.2.5		Supply G5 subbase, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	50		Rate Only
8.2.2.6		Supply G7 natural gravel, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	90		
8.2.3		Finishing				
8.2.3.1	8.3.10	Topsoiling	m²	1500		
8.2.3.2	8.3.11	Grassing or other Vegetation Cover	m²	750		
8.2.4	SANS 1200DA	Restricted Excavation				
8.2.4.1		Excavate in all materials by hand to expose existing services	m³	75		
	8.3.2(a)	Excavate for restricted foundations, footings and trenches in all materials and use for backfill or embankment or dispose				
8.2.4.2		Excavate and trim to lines and levels under reservoir	m³	100		
8.2.4.3		Other restricted excavation for chambers etc	m³	100		
	8.3.3(b)	Extra over items 2.3.2 for restricted excavation in:				
8.2.4.4		1) Intermediate material	m³	25		
8.2.4.5		2) Hard rock material	m³	50		
8.2.4.6		Excavate unsuitable material from below founding level as ordered by Engineer and dispose of to approved spoil site	m³	150		
8.2.5	SANS 1200DB	PIPE EXCAVATIONS				
8.2.5.1	8.3.2 PSDB 8.1.4 PSDB 8.3.3.4	(a) 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	500		
	8.3.2	(b) Extra over item 3.2.5.1 for excavation in:				
8.2.5.2		1) Intermediate material	m³	50		
8.2.5.3		2) Hard rock (Prov)	m³	150		
8.3	SANS 1200G	REINFORCED CONCRETE RESERVOIR				
8.3.1	8.1.1 8.2	FORMWORK				
	8.2.1	Rough vertical to degree of accuracy III				
8.3.1.1		Footings to walls (curved)	m²	50		
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.3.1.2		Walls outside below ground level (curved)	m²	200		
8.3.1.3		Sump & encasement to pipes	m²	40		
8.3.1.4		Manholes	m²	120		
	8.2.2	Smooth vertical to degree of accuracy II				
8.3.1.5		Walls inside & outside above ground level (curved)	m²	475		
8.3.1.6		Column bases	m²	30		
8.3.1.7		Footing at expansion joint	m²	20		
8.3.1.8		Circular Columns	m²	60		
8.3.1.9		Roof slab & upstand	m²	60		
8.3.1.10		Sump	m²	20		
8.3.1.11		Manhole cover slab	m²	10		
8.3.1.12		Manholes	m²	100		
	8.2.2	Smooth horizontal to degree of accuracy II				
8.3.1.13		Roof soffit	m²	325		
8.3.1.14		Manholes	m²	50		
	8.2.6	Box-outs for pipe specials to be installed then grouted in place:				
		1) Box-out in reservoir wall to accommodate:				
8.3.1.15		a) DN150 inlet pipe	No.	1		
8.3.1.16		b) DN150 scour pipe	No.	1		
8.3.1.17		c) DN250 outlet pipe	No.	1		
8.3.1.18		d) DN300 overflow pipe	No.	1		
		2) Box-out in chamber wall to accommodate:				
8.3.1.19		a) DN150 scour pipe	No.	1		
8.3.1.20		b) DN250 outlet pipe	No.	1		
8.3.1.21		c) DN300 overflow pipe	No.	1		
		3) Box-out in reservoir roof to accommodate:				
8.3.1.22		a) DN50 holes for level control and telemetry equipment	No.	4		
8.3.1.23		b) DN100 holes for sampling equipment	No.	2		
8.3.1.24		c) DN150 air vents	No.	8		
8.3.1.25		d) DN150 roof drainage outlets	No.	18		
8.3.2	8.3	REINFORCEMENT				
	8.3.1	Mild steel bars				
8.3.2.1		R8 Basic Price	t	2		
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
	8.3.1	Extra-over item 3.3.2.1 for bars of diameter				
8.3.2.2		R10	t	1		
	8.3.1	High-tensile steel bars				
8.3.2.3		Y25 Basic price	t	35		
	8.3.1	Extra-over item 3.3.2.3 for bars of diameter				
8.3.2.4		Y10	t	8		
8.3.2.5		Y12	t	20		
8.3.2.6		Y16	t	4		
8.3.2.7		Y20	t	1		
	8.3.2	High-Tensile Welded Mesh				
8.3.2.8		Type reference #245	m²	60		
8.3.2.9		Type reference #193	m²	20		
8.3.3	8.4 PSG 8.1.3	CONCRETE				
8.3.3.1	PSG 5.5.1.6 PSG 8.10	No-fines concrete under floor & to fill voids	m³	45		
	8.4.2	Blinding Layer (Grade 15/19 MPa)				
8.3.3.2	PSG 8.2.8	50mm blinding layer	m³	50		
8.3.3.3		5mm 1:5 Dry Mortar Mix layer below plastic bond breaker	m²	380		
	8.4.3	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
8.3.3.4		Walls above footing	m³	75		
8.3.3.5		Footings to walls	m³	50		
8.3.3.6		Floor slabs	m³	65		
8.3.3.7		Roof slab & upstand	m³	90		
8.3.3.8		Columns with bases	m³	15		
8.3.3.9		Encasement to inlet / outlet / overflow / scour pipes	m³	20		
8.3.3.10		Inlet & outlet chambers (as per Drawings)	m³	30		
	8.4.3	Strength concrete: 15 MPa/19 mm				
8.3.3.11	PSG 8.2.8	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	7		
8.3.3.12		Mass concrete including splash aprons from roof overflow and filling under reservoir footings (where ordered by the Engineer)	m³	50		
	8.4.3	Strength 25MPa/19mm concrete				
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.3.3.13		25MPa/19mm concrete to benching	m³	5		
8.3.4	8.4.4 PSG 8.4.4	UNFORMED SURFACE FINISHES				
		(a) Wood-floated finish (to degree of accuracy II)				
8.3.4.1		Top of reservoir wall footing (outside)	m²	25		
8.3.4.2		Reservoir roof	m²	320		
8.3.4.3		Invert to reservoir sump	m²	4		
8.3.4.4		Top of upstand	m²	7		
		(b) Steel-floated (to degree of accuracy II)				
8.3.4.5		Top of reservoir Wall	m²	20		
8.3.4.6		Top Reservoir Floor Slab & Footing inside	m²	320		
8.3.4.7		Top of column Bases	m²	20		
8.3.5	8.5 PSG 8.5	JOINTS				
8.3.5.1		1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with:	m	70		
		a) 250 mm wide x 2mm thick hypalon bandage				
		b) 2mm aluminium strip with 50mm wide backing bondage breaker				
	PSG 3.11.2	c) 250mm rearguard waterstop as per detail on drawings				
		d) Closed cell Polyethylene 100kg/m or 30mm closed cell high density void former				
8.3.5.2		2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with:	m	35		
		a) 200mm wide x 2 mm thick hypalon bandage or similar approved				
	PSG 3.11.2	b) 250mm rearguard waterstop with centre bulb				
8.3.5.3		3) Construction joints in reservoir walls (as per drawings) measured by the total lengths of construction joints complete with:	m	130		
		a) 150mm wide by 1.6mm thick mild steel strips, hot dip galvanized GI waterstop				
		b) 150mm wide Lanko Bandage or similar approved				
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.3.5.4		4) Isolation Joints in reservoir (as per drawings) measured by the total lengths of isolation joints complete with:	m	75		
		a) 10mm Jointex or softboard				
	PSG 3.11.4	b) 10x10mm polysulphide sealant to SABS 1077				
8.3.6		MISCELLANEOUS CONCRETE ITEMS				
8.3.6.1	PSG 3.11.4 PSG 8.17	500 micron black plastic bond breaker over no-fines concrete under reservoir floor	m²	380		
8.3.6.2	PSG 8.18	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	65		
8.3.6.3	PSG 8.19	Polyurethane seal between reservoir roof and walls	m	65		
8.3.6.4		Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	65		
8.3.6.5		Concrete planks to reservoir over outlet manhole to reservoir.	No	4		
8.3.6.6		Cast in situ (25MPa concrete) standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around reservoir perimeter complete (see standard detail drg)	m	75		
8.3.6.7		200gm/m2 needle punched geotextile (1m width)	m²	75		
8.3.6.8		Cleaning and sterilizing reservoir and associated pipework to Engineer's approval	Sum	1		
8.3.6.9	PSG8.15	Reservoir Watertightnes test including reservoir roof	sum	1		
8.3.6.10		Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
8.3.6.11		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	14		
		Manhole items				
8.3.6.12		Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
8.3.6.13		Concrete cover slab complete with manhole frame cast in, including lifting hooks and air vents. Note payment of cast iron manhole frame and cover paid seperately	No	1		
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.3.6.14	PSG 8.16	"Calcimite" or similar approved step irons general purpose to BS1247:1975	No	10		
8.3.6.15	PSG 8.16	Manhole cover (to SABS 558) type 9E with frame	No	2		
8.4	SANS 1200 HA	RESERVOIR STRUCTURAL WORK				
8.4.1		STRUCTURAL STEELWORK				
	8.3.1	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
		Access ladders with Cage				
8.4.1.1		Internal 3.5m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
8.4.1.2		External 3.2m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
8.4.1.3		2m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
		Reservoir and Chambers' roof elements				
8.4.1.4		50mm diameter sleeved holes in reservoir roof for level control and telemetry equipment as shown on the drawings.	No	4		
8.4.1.5		100mm diameter sleeved holes in reservoir roof for sampling equipment (As required).	No	2		
8.4.1.6		Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	8		
8.4.1.7	PSG 8.16	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	PSG 8.16	Air Vents				
8.4.1.8		GMS DN150 reservoir ventilators as per detail on drawings	No	4		
		Wall-Brackets for inlet pipe as per drawings				
8.4.1.9		100x100x10mm thick end plate welded to 50mm dia pipe fixed to concrete with 4 No. M12 s/s bolts	No.	4		
8.4.1.10		1 No. M20 stainless steel bolt grade 8.8	No.	8		
8.4.1.11		1 No. M16 s/s bolt	No.	8		
8.4.1.12		50mm dia pipe 4mm wall thickness	No.	4		
8.5	SANS 1200L	RESERVOIR PIPEWORK				
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
		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)				
8.5.1	8.2.5	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	PSL 8.2.1	OVERFLOW & SCOUR DRAINAGE PIPELINES				
8.5.1.1		300mm diameter uPVC Class 34 Heavy Duty Sewer Drainage Pipe	m	100		
8.5.1.2		Construct headwall complete with 2.2m wide by 3m long stone pitched scour apron, see detail drawing and build-in DN600 concrete pipe	Sum	1		
		SPECIALS AND FITTINGS				
		All pipework to be eproxy coated and lined galavanised mild steel, 4mm wall thickness.				
		OUTLET				
8.5.1.3		P1: DN250 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end and DN550 bellmouth the other. 1100mm c/bellmouth and 2900mm C/F	No.	1		
8.5.1.4		P2: DN250 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
8.5.1.5		P3: DN250 dismantling joint	No.	1		
8.5.1.6		P4: DN250 epoxy coated and lined mild steel pipe flanged PN16 one end and plain-ended the other, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm f/plain end. Branch to be located 500mm C/Plain-end and extending 350 mm C/F	No.	1		
8.5.1.7		P5: DN100 RS gate valve flanged PN10 with non-rising spindle and handwheel	No.	1		
8.5.1.8		P6: DN100 multi-orifice anti-shock air valve as specified	No.	1		
8.5.1.9		P7: DN250 x DN110 eoxy coated and lined mild steel reducer flanged PN16 both ends		0		
8.5.1.10		P8: DN110 uPVC PN16 flange adaptor to suit spigot & socket uPVC pipe	No.	1		
		OVERFLOW				
8.5.1.11		P9: 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		
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.5.1.12		P10: DN300 epoxy coated and lined mild steel 90° bend. Buttressed flanged PN16 one end and plain ended the other. 1250mm c/f and 3050mm c/plain end.	No.	1		
		SCOUR				
8.5.1.13		P11: DN150 Rilsan coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 11175mm c/f.	No.	1		
8.5.1.14		P12: DN150 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
8.5.1.15		P13: DN150 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				
8.5.1.16		P14: DN150 epoxy coated and lined mild steel puddle pipe, flanged PN16 both ends. Pipe barrel to be 600mm f/f with puddle flange 300mm from plain end.	No.	1		
8.5.1.17		P15: DN150 epoxy coated and lined mild steel 90° short radius bend, flanged PN16 both ends, 150mm c/f and 2800mm c/f.	No.	1		
8.5.1.18		P16: DN150 epoxy coated and lined mild steel pipe with 45° short radius bends each end, flanged PN16 both ends, length to suit.	No.	1		
8.5.1.19		P17: DN150 x DN110 epoxy coated and lined mild steel concentric reducer flanged each end 600mm long, PN16.	No.	1		
8.5.1.20		P17A: DN110 PN16 uPVC flange adaptor.	No.	1		
8.5.1.21		P18: DN150 Direct Acting Reservoir Control Float Valve PN16 to Engineer's Approval. (design max flow: 50 l/s; Max static head (no flow): 50m)	No.	1		
8.5.2	1200LB	BEDDING (overflow and scour pipelines)				
	8.2.1 PSL 8.2.1	Provision of bedding from available sources on site				
8.5.2.1		Selected granular material	m³	20		
8.5.2.2		Selected fill material	m³	200		
	8.2.2 PSL 8.2.2	Supply only of bedding by importation (provisional)from commercial sources				
8.5.2.3		Selected granular material	m³	75		
8.5.2.4		Selected fill material	m³	100		
8.5.3	PSL 8.2.6	SUBSOIL DRAINAGE (Reservoir)				
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
		Supply and lay (as detailed on drawing):				
8.5.3.1		Sand compacted to 100% Mod AASHTO	m³	30		
8.5.3.2		19mm crushed stone to reservoir perimeter	m³	45		
8.5.3.3		200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	750		
8.5.3.4		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		
8.5.3.5		25mm proprietary drainage void former using premoulded HDPE or Similar Approved	m²	200		
8.6		RESERVOIR SITE WORKS				
8.6.1		RESERVOIR FENCING AND SITEWORKS				
		FENCING				
8.6.1.1		Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	250 000.00	250 000.00
8.6.1.2		Charges on profit on item 3.6.1.1 above	%	250000		
8.7		RESERVOIR ACCESS ROAD				
8.7.1	SANS 1200DM	EARTHWORKS (ROADS, SUBGRADE)				
	8.3.3b)	Road-bed preparation and compaction of material				
8.7.1.1		Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	175		
		Extra over item 3.7.1.1 :				
8.7.1.2		Process in-situ material with Lime stabiliser	m³	300		
8.7.2	SANS 1200MF	WEARING COURSE				
8.7.2.1	8.3.3a)	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	300		
8.8		MISCELLANEOUS				
8.8.1	1200DK	GABIONS AND PITCHING				
8.8.1.1	8.2.1a	Surface preparation for bedding of gabions with approved excavated material	m²	10		
8.8.1.2	8.2.2	1mx1mx2m Gabions	m³	6		
8.8.1.3	8.2.2	230mm thick reno mattress	m²	10		
CARRIED FORWARD						

SECTION 8 : 1 ML RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
8.8.1.4	8.2.4	200grm/m2 needlepunched geofabric	m²	20		
	SANS 1200ME	Stabilizing agent				
8.8.2	8.3.8	Ordinary Portland cement (CEM 1) 3% by weight.	50kg Bags	250		
8.8.3		Lime Stabiliser	t	1		
TOTAL FOR SECTION 8 CARRIED FORWARD TO SUMMARY						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
9.1	SANS 1200D	EARTHWORKS				
		Site Clearance and Removal of Topsoil				
9.1.1	8.3.1	Prepare Reservoir Site	ha	0.12		
9.1.2	8.3.1.2	Remove topsoil to nominal depth of 150 mm and stockpile or dispose	m²	300		
9.1.3	SANS 1200C 8.2.9 PSC3.1	Transport and dispose of materials to suitable dumping site	m³.km	250		
9.2	SANS 1200D	EXCAVATION				
9.2.1	8.3.2	Bulk Excavation				
9.2.1.1	8.3.2(a) PSDA	Excavate in all materials to bulk excavation line (that is about 100mm above the Final Excavation Level), stockpile and maintain for backfill and dispose of remainder to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:3 and compacting)	m³	750		
	8.3.2(b)	Extra-over Item 3.2.1.1 for excavation in :				
9.2.1.2		1) Intermediate material	m³	150		
9.2.1.3		2) Hard rock material (blasting)	m³	200		
9.2.1.4		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	50		
9.2.1.5		4) Boulder material class A	m³	75		
9.2.1.6		5) Boulder material class B	m³	50		
9.2.2	8.3.4	Importing of Materials				
9.2.2.1	8.3.4(a)	Import approved topsoil from commercial source (provisional)	m³	15		
9.2.2.2	PSDA 8.3.4.2	Import approved 25 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	8		
	8.3.4(b) PSDA 8.3.4.2	Layer works To backfill over-excavation of unsuitable material:				
9.2.2.3		Supply G2 crusher run, place and compact in max 200mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	40		
9.2.2.4		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	120		
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.2.2.5		Supply G5 subbase, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	30		Rate Only
9.2.2.6		Supply G7 natural gravel, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	40		
9.2.3		Finishing				
9.2.3.1	8.3.10	Topsoiling	m²	300		
9.2.3.2	8.3.11	Grassing or other Vegetation Cover	m²	200		
9.2.4	SANS 1200DA	Restricted Excavation				
9.2.4.1		Excavate in all materials by hand to expose existing services	m³	30		
	8.3.2(a)	Excavate for restricted foundations, footings and trenches in all materials and use for backfill or embankment or dispose				
9.2.4.2	PSDA4.4	Excavate and trim to lines and levels under reservoir	m³	50		
9.2.4.3	PSDA4.4	Other restricted excavation for chambers etc	m³	50		
	8.3.3(b)	Extra over items 2.3.2 for restricted excavation in:				
9.2.4.4		1) Intermediate material	m³	15		
9.2.4.5		2) Hard rock material	m³	25		
9.2.4.6		Excavate unsuitable material from below founding level as ordered by Engineer and dispose of to approved spoil site	m³	50		
9.2.5	SANS 1200DB	PIPE EXCAVATIONS				
9.2.5.1	8.3.2 PSDB 8.1.4 PSDB 8.3.3.4	(a) 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	200		
	8.3.2	(b) Extra over item 3.2.5.1 for excavation in:				
9.2.5.2		1) Intermediate material	m³	40		
9.2.5.3		2) Hard rock (Prov)	m³	75		
9.3	SANS 1200G	REINFORCED CONCRETE RESERVOIR				
9.3.1	8.1.1 8.2	FORMWORK				
	8.2.1	Rough vertical to degree of accuracy III				
9.3.1.1		Footings to walls (curved)	m²	12		
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.3.1.2		Walls outside below ground level (curved)	m²	30		
9.3.1.3		Sump & encasement to pipes	m²	30		
9.3.1.4		Manholes	m²	90		
	8.2.2	Smooth vertical to degree of accuracy II				
9.3.1.5		Walls inside & outside above ground level (curved)	m²	190		
9.3.1.6		Column bases	m²	3		
9.3.1.7		Footing at expansion joint	m²	8		
9.3.1.8		Circular Columns	m²	11		
9.3.1.9		Roof slab & upstand	m²	24		
9.3.1.10		Sump	m²	15		
9.3.1.11		Manhole cover slab	m²	8		
9.3.1.12		Manholes	m²	125		
	8.2.2	Smooth horizontal to degree of accuracy II				
9.3.1.13		Roof soffit	m²	100		
9.3.1.14		Manholes	m²	15		
	8.2.6	Box-outs for pipe specials to be installed then grouted in place:				
		1) Box-out in reservoir wall to accommodate:				
9.3.1.15		a) DN100 inlet pipe	No.	1		
9.3.1.16		b) DN150 scour pipe	No.	1		
9.3.1.17		c) DN200 outlet pipe	No.	1		
9.3.1.18		d) DN200 overflow pipe	No.	1		
		2) Box-out in chamber wall to accommodate:				
9.3.1.19		a) DN150 scour pipe	No.	1		
9.3.1.20		b) DN200 outlet pipe	No.	1		
9.3.1.21		c) DN200 overflow pipe	No.	1		
		3) Box-out in reservoir roof to accommodate:				
9.3.1.22		a) DN50 holes for level control and telemetry equipment	No.	4		
9.3.1.23		b) DN100 holes for sampling equipment	No.	2		
9.3.1.24		c) DN150 air vents	No.	4		
9.3.1.25		d) DN150 roof drainage outlets	No.	14		
9.3.2	8.3	REINFORCEMENT				
	8.3.1	Mild steel bars				
9.3.2.1		R8 Basic Price	t	1		
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
	8.3.1	Extra-over item 3.3.2.1 for bars of diameter				
9.3.2.2		R10	t	0.5		
	8.3.1	High-tensile steel bars				
9.3.2.3		Y25 Basic price	t	12		
	8.3.1	Extra-over item 3.3.2.3 for bars of diameter				
9.3.2.4		Y10	t	2.5		
9.3.2.5		Y12	t	8		
9.3.2.6		Y16	t	1.5		
9.3.2.7		Y20	t	0.5		
	8.3.2	High-Tensile Welded Mesh				
9.3.2.8		Type reference #245	m²	40		
9.3.2.9		Type reference #193	m²	8		
9.3.3	8.4 PSG 8.1.3	CONCRETE				
9.3.3.1	PSG 5.5.1.6	No-fines concrete under floor & to fill voids	m³	10		
	8.4.2	Blinding Layer (Grade 15/19 MPa)				
9.3.3.2	PSG 8.2.8	50mm blinding layer	m³	8		
9.3.3.3		5mm 1:5 Dry Mortor Mix below plastic bond breaker	m²	155		
	8.4.3	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
9.3.3.4		Walls above footing	m³	22		
9.3.3.5		Footings to walls	m³	10		
9.3.3.6		Floor slabs	m³	16		
9.3.3.7		Roof slab & upstand	m³	23		
9.3.3.8		Columns with bases	m³	1.5		
9.3.3.9		Encasement to inlet / outlet / overflow / scour pipes	m³	12		
9.3.3.10		Inlet & outlet chambers (as per Drawings)	m³	20		
	8.4.3	Strength concrete: 15 MPa/19 mm				
9.3.3.11	PSG 8.2.8	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	7		
9.3.3.12		Mass concrete including splash aprons from roof overflow and filling under reservoir footings (where ordered by the Engineer)	m³	25		
	8.4.3	Strength 25MPa/19mm concrete				
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.3.3.13		25MPa/19mm concrete to benching	m³	8		
9.3.4	8.4.4 PSG 8.4.4	UNFORMED SURFACE FINISHES				
		(a) Wood-floated finish (to degree of accuracy II)				
9.3.4.1		Top of reservoir wall footing (outside)	m²	5		
9.3.4.2		Reservoir roof	m²	100		
9.3.4.3		Invert to reservoir sump	m²	5		
9.3.4.4		Top of upstand	m²	6		
		(b) Steel-floated (to degree of accuracy II)				
9.3.4.5		Top of reservoir Wall	m²	9		
9.3.4.6		Top Reservoir Floor Slab & Footing inside	m²	98		
9.3.4.7		Top of column Bases	m²	4		
9.3.5	8.5 PSG 8.5.1	JOINTS				
9.3.5.1		1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with:	m	45		
		a) 250 mm wide x 2mm thick hypalon bandage				
		b) 2mm aluminium strip with 50mm wide backing bondage breaker				
	PSG 3.11.2	c) 250mm rearguard waterstop as per detail on drawings				
		d) Closed cell Polyethylene 100kg/m or 30mm closed cell high density void former				
9.3.5.2		2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with:	m	16		
		a) 200mm wide x 2 mm thick hypalon bandage or similar approved				
	PSG 3.11.2	b) 250mm rearguard waterstop with centre bulb				
9.3.5.3		3) Construction joints in reservoir walls (as per drawings) measured by the total lengths of construction joints complete with:	m	73		
	PSG 3.11.2	a) 150mm wide by 1.6mm thick mild steel strips, hot dip galvanized GI waterstop				
		b) 150mm wide Lanko Bandage or similar approved				
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.3.5.4		4) Isolation Joints in reservoir (as per drawings) measured by the total lengths of isolation joints complete with:	m	38		
		a) 10mm Jointex or softboard				
	PSG 3.11.4	b) 10x10mm polysulphide sealant to SABS 1077				
9.3.6		MISCELLANEOUS CONCRETE ITEMS				
9.3.6.1	PSG 3.11.4 PSG 8.17	500 micron plastic bond breaker over no-fines concrete under reservoir floor	m²	115		
9.3.6.2	PSG 8.18	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	37		
9.3.6.3	PSG 8.19	Polyurethane seal between reservoir roof and walls	m	37		
9.3.6.4		Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	37		
9.3.6.5		Concrete planks to reservoir over outlet manhole to reservoir.	No	2		
9.3.6.6		Cast in situ (25MPa concrete) standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around reservoir perimeter complete (see standard detail drg)	m	42		
9.3.6.7		200gm/m2 needle punched geotextile (1m width)	m²	42		
9.3.6.8	PGW5.28	Cleaning and sterilizing reservoir and associated pipework	Sum	1		
9.3.6.9	PSG8.15	Reservoir Watertightnes test including reservoir roof	sum	1		
9.3.6.10		Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
9.3.6.11		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	14		
		Manhole items				
9.3.6.12		Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
9.3.6.13		Concrete cover slab complete with manhole frame cast in, including lifting hooks and air vents. Note payment of cast iron manhole frame and cover paid seperately	No	1		
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.3.6.14	PSG 8.16 (c)	"Calcimite" or similar approved step irons general purpose to BS1247:1975	No	10		
9.3.6.15	PSG 8.16 (a)	Manhole cover (to SABS 558) type 9E with frame	No	2		
9.4	SANS 1200 HA	RESERVOIR STRUCTURAL WORK				
9.4.1		STRUCTURAL STEELWORK				
	8.3.1	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
		Access ladders with Cage				
9.4.1.1		Internal 3.5m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
9.4.1.2		External 3.0m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
9.4.1.3		2.5m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
		Reservoir and Chambers' roof elements				
9.4.1.4		50mm diameter sleeved holes in reservoir roof for level control and telemetry equipment as shown on the drawings.	No	4		
9.4.1.5		100mm diameter sleeved holes in reservoir roof for sampling equipment (As required).	No	2		
9.4.1.6		Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	8		
9.4.1.7	PSG 8.16 (a)	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	PSG 8.16 (b)	Air Vents				
9.4.1.8		GMS DN150 reservoir ventilators as per detail on drawings	No	4		
		Wall-Brackets for inlet pipe as per drawing C57-304				
9.4.1.9		100x100x10mm thick end plate welded to 50mm dia pipe fixed to concrete with 4 No. M12 s/s bolts	No.	8		
9.4.1.10		1 No. M20 stainless steel bolt grade 8.8	No.	16		
9.4.1.11		1 No. M16 s/s bolt	No.	16		
9.4.1.12		50mm dia pipe 4mm wall thickness	No.	8		
9.5	SANS 1200L	RESERVOIR PIPEWORK				
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
	PSL 8.2.1	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)				
9.5.1	8.2.5	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	PSL 8.2.1	OVERFLOW & SCOUR DRAINAGE PIPELINES				
9.5.1.1		300mm diameter uPVC Class 34 Heavy Duty Sewer Drainage Pipe	m	75		
9.5.1.2		Construct headwall complete as shown on detail drawing and build-in DN300 uPVC pipe	Sum	1		
		SPECIALS AND FITTINGS				
		All pipework to be eproxy coated and lined galavanised mild steel, 4mm wall thickness.				
		OUTLET				
9.5.1.3		P1: DN200 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end and DN450 bellmouth the other. 975mm c/bellmouth and 2150mm C/F	No.	1		
9.5.1.4		P2: DN200 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
9.5.1.5		P3: DN200 dismantling joint	No.	1		
9.5.1.6		P4: DN200 epoxy coated and lined mild steel pipe flanged PN16 one end and plain-ended the other, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm f/plain end. Branch to be located 500mm C/Plain-end and extending 350 mm C/F	No.	1		
9.5.1.7		P5: DN100 RS gate valve flanged PN10 with non-rising spindle and handwheel	No.	1		
9.5.1.8		P6: DN100 multi-orifice anti-shock air valve as specified	No.	1		
9.5.1.9		P7: DN200 x DN90 eoxy coated and lined mild steel reducer flanged PN16 both ends	No	1		
9.5.1.10		P8: DN90 uPVC PN16 flange adaptor to suit spigot & socket uPVC pipe	No.	1		
		OVERFLOW				
9.5.1.11		P9: DN200 epoxy coated and lined mild steel pipe,buttressed flanged PN16 one end and DN350 bellmouth with 4 no. anti-vortex baffles the other end. 2420mm f/bellmouth.	No.	1		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.5.1.12		P10: DN200 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				
9.5.1.13		P11: DN150 Rilsan coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 6400mm c/f.	No.	1		
9.5.1.14		P12: DN150 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
9.5.1.15		P13: DN150 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				
9.5.1.16		P14: DN100 epoxy coated and lined mild steel puddle pipe, flanged PN16 both ends. Pipe barrel to be 600mm f/f with puddle flange 300mm from plain end.	No.	1		
9.5.1.17		P15: DN100 epoxy coated and lined mild steel 90° short radius bend, flanged PN16 both ends, 150mm c/f and 2800mm c/f.	No.	1		
9.5.1.18		P16: DN100 epoxy coated and lined mild steel pipe with 45° short radius bends each end, flanged PN16 both ends, length to suit.	No.	1		
9.5.1.19		P17: DN100 x DN90 epoxy coated and lined mild steel concentric reducer flanged each end 600mm long, PN16.	No.	1		
9.5.1.20		P17A: DN90 PN16 uPVC flange adaptor.	No.	1		
9.5.1.21		P18: DN100 Direct Acting Reservoir Control Float Valve PN16 to Engineer's Approval. (design max flow: 50 l/s; Max static head (no flow): 50m)	No.	1		
9.5.2	1200LB	BEDDING (overflow and scour pipelines)				
	8.2.1 PSL 8.2.1	Provision of bedding from available sources on site				
9.5.2.1		Selected granular material	m³	20		
9.5.2.2		Selected fill material	m³	200		
	8.2.2 PSL 8.2.2	Supply only of bedding by importation (provisional)from commercial sources				
9.5.2.3		Selected granular material	m³	50		
9.5.2.4		Selected fill material	m³	100		
9.5.3	PSL 8.2.6	SUBSOIL DRAINAGE (Reservoir)				
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
		Supply and lay (as detailed on drawing):				
9.5.3.1		Sand compacted to 100% Mod AASHTO	m³	35		
9.5.3.2		19mm crushed stone to reservoir perimeter	m³	75		
9.5.3.3		200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	850		
9.5.3.4		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	400		
9.5.3.5		25mm proprietary drainage void former using premoulded HDPE or Similar Approved	m²	275		
9.6	SANS 1200X	RESERVOIR SITE WORKS				
9.6.1		RESERVOIR FENCING AND SITEWORKS				
		FENCING				
9.6.1.1		Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	100 000.00	100 000.00
9.6.1.2		Charges on profit on item 3.6.1.1 above	%	100000		
9.7		RESERVOIR ACCESS ROAD				
9.7.1	SANS 1200DM	EARTHWORKS (ROADS, SUBGRADE)				
	8.3.3b)	Road-bed preparation and compaction of material				
9.7.1.1		Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	150		
		Extra over item 3.7.1.1 :				
9.7.1.2		Process in-situ material with Lime stabiliser	m³	350		
9.7.2	SANS 1200MF	WEARING COURSE				
9.7.2.1	8.3.3a)	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	250		
9.8		MISCELLANEOUS				
9.8.1	1200DK	GABIONS AND PITCHING				
9.8.1.1	8.2.1a	Surface preparation for bedding of gabions with approved excavated material	m²	10		
9.8.1.2	8.2.2	1mx1mx2m Gabions	m³	6		
9.8.1.3	8.2.2	230mm thick reno mattress	m²	10		
CARRIED FORWARD						

SECTION 9 : 200KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
9.8.1.4	8.2.4	200grm/m2 needlepunched geofabric	m²	20		
	SANS 1200ME	Stabilizing agent				
9.8.2	8.3.8	Ordinary Portland cement (CEM 1) 3% by weight.	50kg Bags	115		
9.8.3		Lime Stabiliser	t	1.5		
TOTAL FOR SECTION 9 CARRIED FORWARD TO SUMMARY						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
10.1	SANS 1200D	EARTHWORKS				
		Site Clearance and Removal of Topsoil				
10.1.1	8.3.1	Prepare Reservoir Site	ha	0.12		
10.1.2	8.3.1.2	Remove topsoil to nominal depth of 150 mm and stockpile or dispose	m²	300		
10.1.3	SANS 1200C 8.2.9 PSC3.1	Transport and dispose of materials to suitable dumping site	m³.km	250		
10.2	SANS 1200D	EXCAVATION				
10.2.1	8.3.2	Bulk Excavation				
10.2.1.1	8.3.2(a) PSDA	Excavate in all materials to bulk excavation line (that is about 100mm above the Final Excavation Level), stockpile and maintain for backfill and dispose of remainder to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:3 and compacting)	m³	750		
	8.3.2(b)	Extra-over Item 3.2.1.1 for excavation in :				
10.2.1.2		1) Intermediate material	m³	150		
10.2.1.3		2) Hard rock material (blasting)	m³	200		
10.2.1.4		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	50		
10.2.1.5		4) Boulder material class A	m³	75		
10.2.1.6		5) Boulder material class B	m³	50		
10.2.2	8.3.4	Importing of Materials				
10.2.2.1	8.3.4(a)	Import approved topsoil from commercial source (provisional)	m³	15		
10.2.2.2	PSDA 8.3.4.2	Import approved 25 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	8		
	8.3.4(b) PSDA 8.3.4.2	Layer works To backfill over-excavation of unsuitable material:				
10.2.2.3		Supply G2 crusher run, place and compact in max 200mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	40		
10.2.2.4		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	120		
CARRIED FORWARD						

SECTION 10 : 250KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.2.2.5		Supply G5 subbase, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	30		Rate Only
10.2.2.6		Supply G7 natural gravel, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	40		
10.2.3		Finishing				
10.2.3.1	8.3.10	Topsoiling	m²	300		
10.2.3.2	8.3.11	Grassing or other Vegetation Cover	m²	200		
10.2.4	SANS 1200DA	Restricted Excavation				
10.2.4.1		Excavate in all materials by hand to expose existing services	m³	30		
	8.3.2(a)	Excavate for restricted foundations, footings and trenches in all materials and use for backfill or embankment or dispose				
10.2.4.2	PSDA4.4	Excavate and trim to lines and levels under reservoir	m³	50		
10.2.4.3	PSDA4.4	Other restricted excavation for chambers etc	m³	50		
	8.3.3(b)	Extra over items 2.3.2 for restricted excavation in:				
10.2.4.4		1) Intermediate material	m³	15		
10.2.4.5		2) Hard rock material	m³	25		
10.2.4.6		Excavate unsuitable material from below founding level as ordered by Engineer and dispose of to approved spoil site	m³	50		
10.2.5	SANS 1200DB	PIPE EXCAVATIONS				
10.2.5.1	8.3.2 PSDB 8.1.4 PSDB 8.3.3.4	(a) 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	200		
	8.3.2	(b) Extra over item 3.2.5.1 for excavation in:				
10.2.5.2		1) Intermediate material	m³	40		
10.2.5.3		2) Hard rock (Prov)	m³	75		
10.3	SANS 1200G	REINFORCED CONCRETE RESERVOIR				
10.3.1	8.1.1 8.2	FORMWORK				
	8.2.1	Rough vertical to degree of accuracy III				
10.3.1.1		Footings to walls (curved)	m²	12		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.3.1.2		Walls outside below ground level (curved)	m²	40		
10.3.1.3		Sump & encasement to pipes	m²	30		
10.3.1.4		Manholes	m²	90		
	8.2.2	Smooth vertical to degree of accuracy II				
10.3.1.5		Walls inside & outside above ground level (curved)	m²	225		
10.3.1.6		Column bases	m²	3		
10.3.1.7		Footing at expansion joint	m²	8		
10.3.1.8		Circular Columns	m²	14		
10.3.1.9		Roof slab & upstand	m²	24		
10.3.1.10		Sump	m²	15		
10.3.1.11		Manhole cover slab	m²	8		
10.3.1.12		Manholes	m²	125		
	8.2.2	Smooth horizontal to degree of accuracy II				
10.3.1.13		Roof soffit	m²	100		
10.3.1.14		Manholes	m²	15		
	8.2.6	Box-outs for pipe specials to be installed then grouted in place:				
		1) Box-out in reservoir wall to accommodate:				
10.3.1.15		a) DN100 inlet pipe	No.	1		
10.3.1.16		b) DN150 scour pipe	No.	1		
10.3.1.17		c) DN200 outlet pipe	No.	1		
10.3.1.18		d) DN200 overflow pipe	No.	1		
		2) Box-out in chamber wall to accommodate:				
10.3.1.19		a) DN150 scour pipe	No.	1		
10.3.1.20		b) DN200 outlet pipe	No.	1		
10.3.1.21		c) DN200 overflow pipe	No.	1		
		3) Box-out in reservoir roof to accommodate:				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.3.1.22		a) DN50 holes for level control and telemetry equipment	No.	4		
10.3.1.23		b) DN100 holes for sampling equipment	No.	2		
10.3.1.24		c) DN150 air vents	No.	4		
10.3.1.25		d) DN150 roof drainage outlets	No.	14		
10.3.2	8.3	REINFORCEMENT				
	8.3.1	Mild steel bars				
10.3.2.1		R8 Basic Price	t	1		
	8.3.1	Extra-over item 3.3.2.1 for bars of diameter				
10.3.2.2		R10	t	0.5		
	8.3.1	High-tensile steel bars				
10.3.2.3		Y25 Basic price	t	14		
	8.3.1	Extra-over item 3.3.2.3 for bars of diameter				
10.3.2.4		Y10	t	2.7		
10.3.2.5		Y12	t	10		
10.3.2.6		Y16	t	1.7		
10.3.2.7		Y20	t	0.7		
	8.3.2	High-Tensile Welded Mesh				
10.3.2.8		Type reference #245	m²	40		
10.3.2.9		Type reference #193	m²	8		
10.3.3	8.4 PSG 8.1.3	CONCRETE				
10.3.3.1	PSG 5.5.1.6	No-fines concrete under floor & to fill voids	m³	10		
	8.4.2	Blinding Layer (Grade 15/19 MPa)				
10.3.3.2	PSG 8.2.8	50mm blinding layer	m³	8		
10.3.3.3		5mm 1:5 Dry Mortor Mix below plastic bond breaker	m²	155		
	8.4.3	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
10.3.3.4		Walls above footing	m³	27		
10.3.3.5		Footings to walls	m³	10		
10.3.3.6		Floor slabs	m³	16		
10.3.3.7		Roof slab & upstand	m³	23		
10.3.3.8		Columns with bases	m³	1.7		
CARRIED FORWARD						

SECTION 10 : 250KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.3.3.9		Encasement to inlet / outlet / overflow / scour pipes	m³	12		
10.3.3.10		Inlet & outlet chambers (as per Drawings)	m³	20		
	8.4.3	Strength concrete: 15 MPa/19 mm				
10.3.3.11	PSG 8.2.8	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	7		
10.3.3.12		Mass concrete including splash aprons from roof overflow and filling under reservoir footings (where ordered by the Engineer)	m³	25		
	8.4.3	Strength 25MPa/19mm concrete				
10.3.3.13		25MPa/19mm concrete to benching	m³	8		
10.3.4	8.4.4 PSG 8.4.4	UNFORMED SURFACE FINISHES				
		(a) Wood-floated finish (to degree of accuracy II)				
10.3.4.1		Top of reservoir wall footing (outside)	m²	5		
10.3.4.2		Reservoir roof	m²	100		
10.3.4.3		Invert to reservoir sump	m²	5		
10.3.4.4		Top of upstand	m²	6		
		(b) Steel-floated (to degree of accuracy II)				
10.3.4.5		Top of reservoir Wall	m²	9		
10.3.4.6		Top Reservoir Floor Slab & Footing inside	m²	98		
10.3.4.7		Top of column Bases	m²	4		
10.3.5	8.5 PSG 8.5.1	JOINTS				
10.3.5.1		1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with:	m	45		
		a) 250 mm wide x 2mm thick hypalon bandage				
		b) 2mm aluminium strip with 50mm wide backing bondage breaker				
	PSG 3.11.2	c) 250mm rearguard waterstop as per detail on drawings				
		d) Closed cell Polyethylene 100kg/m or 30mm closed cell high density void former				
CARRIED FORWARD						

SECTION 10 : 250KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.3.5.2		2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with:	m	16		
		a) 200mm wide x 2 mm thick hypalon bandage or similar approved				
	PSG 3.11.2	b) 250mm rearguard waterstop with centre bulb				
10.3.5.3		3) Construction joints in reservoir walls (as per drawings) measured by the total lengths of construction joints complete with:	m	73		
	PSG 3.11.2	a) 150mm wide by 1.6mm thick mild steel strips, hot dip galvanized GI waterstop				
		b) 150mm wide Lanko Bandage or similar approved				
10.3.5.4		4) Isolation Joints in reservoir (as per drawings) measured by the total lengths of isolation joints complete with:	m	38		
		a) 10mm Jointex or softboard				
	PSG 3.11.4	b) 10x10mm polysulphide sealant to SABS 1077				
10.3.6		MISCELLANEOUS CONCRETE ITEMS				
10.3.6.1	PSG 3.11.4 PSG 8.17	500 micron plastic bond breaker over no-fines concrete under reservoir floor	m²	115		
10.3.6.2	PSG 8.18	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	37		
10.3.6.3	PSG 8.19	Polyurethane seal between reservoir roof and walls	m	37		
10.3.6.4		Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	37		
10.3.6.5		Concrete planks to reservoir over outlet manhole to reservoir.	No	2		
10.3.6.6		Cast in situ (25MPa concrete) standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around reservoir perimeter complete (see standard detail drg)	m	42		
10.3.6.7		200gm/m2 needle punched geotextile (1m width)	m²	42		
10.3.6.8	PGW5.28	Cleaning and sterilizing reservoir and associated pipework	Sum	1		
10.3.6.9	PSG8.15	Reservoir Watertightnes test including reservoir roof	sum	1		
CARRIED FORWARD						

SECTION 10 : 250KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.3.6.10		Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
10.3.6.11		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	14		
		Manhole items				
10.3.6.12		Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
10.3.6.13		Concrete cover slab complete with manhole frame cast in, including lifting hooks and air vents. Note payment of cast iron manhole frame and cover paid seperately	No	1		
10.3.6.14	PSG 8.16 (c)	"Calcimite" or similar approved step irons general purpose to BS1247:1975	No	10		
10.3.6.15	PSG 8.16 (a)	Manhole cover (to SABS 558) type 9E with frame	No	2		
10.4	SANS 1200 HA	RESERVOIR STRUCTURAL WORK				
10.4.1		STRUCTURAL STEELWORK				
	8.3.1	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
		Access ladders with Cage				
10.4.1.1		Internal 3.5m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
10.4.1.2		External 3.0m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
10.4.1.3		2.5m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
		Reservoir and Chambers' roof elements				
10.4.1.4		50mm diameter sleeved holes in reservoir roof for level control and telemetry equipment as shown on the drawings.	No	4		
10.4.1.5		100mm diameter sleeved holes in reservoir roof for sampling equipment (As required).	No	2		
10.4.1.6		Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	8		
10.4.1.7	PSG 8.16 (a)	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	PSG 8.16 (b)	Air Vents				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.4.1.8		GMS DN150 reservoir ventilators as per detail on drawings	No	4		
		Wall-Brackets for inlet pipe as per drawing C57-304				
10.4.1.9		100x100x10mm thick end plate welded to 50mm dia pipe fixed to concrete with 4 No. M12 s/s bolts	No.	8		
10.4.1.10		1 No. M20 stainless steel bolt grade 8.8	No.	16		
10.4.1.11		1 No. M16 s/s bolt	No.	16		
10.4.1.12		50mm dia pipe 4mm wall thickness	No.	8		
10.5	SANS 1200L	RESERVOIR PIPEWORK				
	PSL 8.2.1	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)				
10.5.1	8.2.5	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	PSL 8.2.1	OVERFLOW & SCOUR DRAINAGE PIPELINES				
10.5.1.1		300mm diameter uPVC Class 34 Heavy Duty Sewer Drainage Pipe	m	75		
10.5.1.2		Construct headwall complete as shown on detail drawing and build-in DN300 uPVC pipe	Sum	1		
		SPECIALS AND FITTINGS				
		All pipework to be eproxy coated and lined galavanised mild steel, 4mm wall thickness.				
		OUTLET				
10.5.1.3		P1: DN200 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end and DN450 bellmouth the other. 975mm c/bellmouth and 2150mm C/F	No.	1		
10.5.1.4		P2: DN200 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
10.5.1.5		P3: DN200 dismantling joint	No.	1		
10.5.1.6		P4: DN200 epoxy coated and lined mild steel pipe flanged PN16 one end and plain-ended the other, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm f/plain end. Branch to be located 500mm C/Plain-end and extending 350 mm C/F	No.	1		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.5.1.7		P5: DN100 RS gate valve flanged PN10 with non-rising spindle and handwheel	No.	1		
10.5.1.8		P6: DN100 multi-orifice anti-shock air valve as specified	No.	1		
10.5.1.9		P7: DN200 x DN90 eoxy coated and lined mild steel reducer flanged PN16 both ends	No	1		
10.5.1.10		P8: DN90 uPVC PN16 flange adaptor to suit spigot & socket uPVC pipe	No.	1		
		OVERFLOW				
10.5.1.11		P9: DN200 epoxy coated and lined mild steel pipe,buttressed flanged PN16 one end and DN350 bellmouth with 4 no. anti-vortex baffles the other end. 2420mm f/bellmouth.	No.	1		
10.5.1.12		P10: DN200 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				
10.5.1.13		P11: DN150 Rilsan coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 6400mm c/f.	No.	1		
10.5.1.14		P12: DN150 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
10.5.1.15		P13: DN150 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				
10.5.1.16		P14: DN100 epoxy coated and lined mild steel puddle pipe, flanged PN16 both ends. Pipe barrel to be 600mm f/f with puddle flange 300mm from plain end.	No.	1		
10.5.1.17		P15: DN100 epoxy coated and lined mild steel 90° short radius bend, flanged PN16 both ends, 150mm c/f and 2800mm c/f.	No.	1		
10.5.1.18		P16: DN100 epoxy coated and lined mild steel pipe with 45° short radius bends each end, flanged PN16 both ends, length to suit.	No.	1		
10.5.1.19		P17: DN100 x DN90 epoxy coated and lined mild steel concentric reducer flanged each end 600mm long, PN16.	No.	1		
10.5.1.20		P17A: DN90 PN16 uPVC flange adaptor.	No.	1		
CARRIED FORWARD						

SECTION 10 : 250KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.5.1.21		P18: DN100 Direct Acting Reservoir Control Float Valve PN16 to Engineer's Approval. (design max flow: 50 l/s; Max static head (no flow): 50m)	No.	1		
10.5.2	1200LB	BEDDING (overflow and scour pipelines)				
	8.2.1 PSL 8.2.1	Provision of bedding from available sources on site				
10.5.2.1		Selected granular material	m³	20		
10.5.2.2		Selected fill material	m³	200		
	8.2.2 PSL 8.2.2	Supply only of bedding by importation (provisional)from commercial sources				
10.5.2.3		Selected granular material	m³	50		
10.5.2.4		Selected fill material	m³	100		
10.5.3	PSL 8.2.6	SUBSOIL DRAINAGE (Reservoir)				
		Supply and lay (as detailed on drawing):				
10.5.3.1		Sand compacted to 100% Mod AASHTO	m³	35		
10.5.3.2		19mm crushed stone to reservoir perimeter	m³	75		
10.5.3.3		200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	850		
10.5.3.4		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	400		
10.5.3.5		25mm proprietary drainage void former using premoulded HDPE or Similar Approved	m²	275		
10.6	SANS 1200X	RESERVOIR SITE WORKS				
10.6.1		RESERVOIR FENCING AND SITEWORKS				
		FENCING				
10.6.1.1		Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	100 000.00	100 000.00
10.6.1.2		Charges on profit on item 3.6.1.1 above	%	100000		
10.7		RESERVOIR ACCESS ROAD				
10.7.1	SANS 1200DM	EARTHWORKS (ROADS, SUBGRADE)				
	8.3.3b)	Road-bed preparation and compaction of material				
CARRIED FORWARD						

SECTION 10 : 250KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
10.7.1.1		Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	150		
		Extra over item 3.7.1.1 :				
10.7.1.2		Process in-situ material with Lime stabiliser	m³	350		
10.7.2	SANS 1200MF	WEARING COURSE				
10.7.2.1	8.3.3a)	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	250		
10.8		MISCELLANEOUS				
10.8.1	1200DK	GABIONS AND PITCHING				
10.8.1.1	8.2.1a	Surface preparation for bedding of gabions with approved excavated material	m²	10		
10.8.1.2	8.2.2	1mx1mx2m Gabions	m³	6		
10.8.1.3	8.2.2	230mm thick reno mattress	m²	10		
10.8.1.4	8.2.4	200grm/m2 needlepunched geofabric	m²	20		
	SANS 1200ME	Stabilizing agent				
10.8.2	8.3.8	Ordinary Portland cement (CEM 1) 3% by weight.	50kg Bags	115		
10.8.3		Lime Stabiliser	t	1.5		
TOTAL FOR SECTION 10 CARRIED FORWARD TO SUMMARY						

SECTION 11 : 500KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
11.1	SANS 1200D	EARTHWORKS				
		Site Clearance and Removal of Topsoil				
11.1.1	8.3.1	Prepare Reservoir Site	ha	0.15		
11.1.2	8.3.1.2	Remove topsoil to nominal depth of 150 mm and stockpile or dispose	m²	750		
11.1.3	SANS 1200C 8.2.9 PSC3.1 PSD 8.3.6	Transport and dispose of materials to suitable dumping site	m³.km	750		
11.2	SANS 1200D	EXCAVATION				
11.2.1	8.3.2	Bulk Excavation				
11.2.1.1	8.3.2(a) PSD 8.3.2	Excavate in all materials to bulk excavation line (that is about 100mm above the Final Excavation Level)), stockpile and maintain for backfill and dispose of remainder to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:3 and compacting)	m³	1500		
	8.3.2(b)	Extra-over Item 3.2.1.1 for excavation in :				
11.2.1.2		1) Intermediate material	m³	400		
11.2.1.3		2) Hard rock material (blasting)	m³	500		
11.2.1.4		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	100		
11.2.1.5		4) Boulder material class A	m³	75		
11.2.1.6		5) Boulder material class B	m³	75		
11.2.2	8.3.4	Importing of Materials				
11.2.2.1	8.3.4(a)	Import approved topsoil from commercial source (provisional)	m³	30		
11.2.2.2		Import approved 25 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	15		
	8.3.4(a)	Layer works To backfill over-excavation of unsuitable material:				
11.2.2.3		Supply G2 crusher run, place and compact in max 200mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	50		
11.2.2.4		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	150		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.2.2.5		Supply G5 subbase, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	25		Rate Only
11.2.2.6		Supply G7 natural gravel, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	50		
11.2.3		Finishing				
11.2.3.1	8.3.10	Topsoiling	m²	800		
11.2.3.2	8.3.11	Grassing or other Vegetation Cover	m²	400		
11.2.4	SANS 1200DA	Restricted Excavation				
11.2.4.1		Excavate in all materials by hand to expose existing services	m³	50		
	8.3.2(a)	Excavate for restricted foundations, footings and trenches in all materials and use for backfill or embankment or dispose				
11.2.4.2		Excavate and trim to lines and levels under reservoir	m³	100		
11.2.4.3		Other restricted excavation for chambers etc	m³	100		
	8.3.3(b)	Extra over items 2.3.2 for restricted excavation in:				
11.2.4.4		1) Intermediate material	m³	25		
11.2.4.5		2) Hard rock material	m³	50		
11.2.4.6		Excavate unsuitable material from below founding level as ordered by Engineer and dispose of to approved spoil site	m³	100		
11.2.5	SANS 1200DB	PIPE EXCAVATIONS				
11.2.5.1	8.3.2 PSDB 8.1.4 PSDB 8.3.3.4	(a) 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	300		
	8.3.2	(b) Extra over item 3.2.5.1 for excavation in:				
11.2.5.2		1) Intermediate material	m³	50		
11.2.5.3		2) Hard rock (Prov)	m³	100		
11.3	SANS 1200G	REINFORCED CONCRETE RESERVOIR				
11.3.1	8.1.1 8.2	FORMWORK				
	8.2.1	Rough vertical to degree of accuracy III				
11.3.1.1		Footings to walls (curved)	m²	20		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.3.1.2		Walls outside below ground level (curved)	m²	75		
11.3.1.3		Sump & encasement to pipes	m²	30		
11.3.1.4		Manholes	m²	110		
	8.2.2	Smooth vertical to degree of accuracy II				
11.3.1.5		Walls inside & outside above ground level (curved)	m²	325		
11.3.1.6		Column bases	m²	5		
11.3.1.7		Footing at expansion joint	m²	15		
11.3.1.8		Circular Columns	m²	15		
11.3.1.9		Roof slab & upstand	m²	35		
11.3.1.10		Sump	m²	15		
11.3.1.11		Manhole cover slab	m²	10		
11.3.1.12		Manholes	m²	150		
	8.2.2	Smooth horizontal to degree of accuracy II				
11.3.1.13		Roof soffit	m²	170		
11.3.1.14		Manholes	m²	35		
	8.2.6	Box-outs for pipe specials to be installed then grouted in place:				
		1) Box-out in reservoir wall to accommodate:				
11.3.1.15		a) DN150 inlet pipe	No.	1		
11.3.1.16		b) DN150 scour pipe	No.	1		
11.3.1.17		c) DN250 outlet pipe	No.	1		
11.3.1.18		d) DN300 overflow pipe	No.	1		
		2) Box-out in chamber wall to accommodate:				
11.3.1.19		a) DN150 scour pipe	No.	1		
11.3.1.20		b) DN250 outlet pipe	No.	1		
11.3.1.21		c) DN300 overflow pipe	No.	1		
		3) Box-out in reservoir roof to accommodate:				
11.3.1.22		a) DN50 holes for level control and telemetry equipment	No.	4		
11.3.1.23		b) DN100 holes for sampling equipment	No.	2		
11.3.1.24		c) DN150 air vents	No.	4		
11.3.1.25		d) DN150 roof drainage outlets	No.	14		
11.3.2	8.3	REINFORCEMENT				
	8.3.1	Mild steel bars				
11.3.2.1		R8 Basic Price	t	1		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
	8.3.1	Extra-over item 3.3.2.1 for bars of diameter				
11.3.2.2		R10	t	0.5		
	8.3.1	High-tensile steel bars				
11.3.2.3		Y25 Basic price	t	17		
	8.3.1	Extra-over item 3.3.2.3 for bars of diameter				
11.3.2.4		Y10	t	3.5		
11.3.2.5		Y12	t	12		
11.3.2.6		Y16	t	1.5		
11.3.2.7		Y20	t	0.5		
	8.3.2	High-Tensile Welded Mesh				
11.3.2.8		Type reference #245	m²	55		
11.3.2.9		Type reference #193	m²	10		
11.3.3	8.4 PSG 8.1.3	CONCRETE				
11.3.3.1	PSG 5.5.1.6	No-fines concrete under floor & to fill voids	m³	20		
	8.4.2	Blinding Layer (Grade 15/19 MPa)				
11.3.3.2	PSG 8.2.8	50mm blinding layer	m³	15		
11.3.3.3		5mm 1:5 Dry Mortor Mix below plastic bond breaker	m²	250		
	8.4.3	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
11.3.3.4		Walls above footing	m³	37		
11.3.3.5		Footings to walls	m³	16		
11.3.3.6		Floor slabs	m³	30		
11.3.3.7		Roof slab & upstand	m³	40		
11.3.3.8		Columns with bases	m³	3		
11.3.3.9		Encasement to inlet / outlet / overflow / scour pipes	m³	15		
11.3.3.10		Inlet & outlet chambers (as per Drawings)	m³	30		
	8.4.3	Strength concrete: 15 MPa/19 mm				
11.3.3.11	PSG 8.2.8	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	10		
11.3.3.12		Mass concrete including splash aprons from roof overflow and filling under reservoir footings (where ordered by the Engineer)	m³	30		
	8.4.3	Strength 25MPa/19mm concrete				
CARRIED FORWARD						

SECTION 11 : 500KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.3.3.13		25MPa/19mm concrete to benching	m³	10		
11.3.4	8.4.4 PSG 8.4.4	UNFORMED SURFACE FINISHES				
		(a) Wood-floated finish (to degree of accuracy II)				
11.3.4.1		Top of reservoir wall footing (outside)	m²	35		
11.3.4.2		Reservoir roof	m²	175		
11.3.4.3		Invert to reservoir sump	m²	4		
11.3.4.4		Top of upstand	m²	7		
		(b) Steel-floated (to degree of accuracy II)				
11.3.4.5		Top of reservoir Wall	m²	20		
11.3.4.6		Top Reservoir Floor Slab & Footing inside	m²	175		
11.3.4.7		Top of column Bases	m²	20		
11.3.5	8.5 PSG 8.5	JOINTS				
11.3.5.1		1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with:	m	58		
		a) 250 mm wide x 2mm thick hypalon bandage				
		b) 2mm aluminium strip with 50mm wide backing bondage breaker				
	PSG 3.11.2	c) 250mm rearguard waterstop as per detail on drawings				
		d) Closed cell Polyethylene 100kg/m or 30mm closed cell high density void former				
11.3.5.2		2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with:	m	25		
		a) 200mm wide x 2 mm thick hypalon bandage or similar approved				
	PSG 3.11.2	b) 250mm rearguard waterstop with centre bulb				
11.3.5.3		3) Construction joints in reservoir walls (as per drawings) measured by the total lengths of construction joints complete with:	m	100		
		a) 150mm wide by 1.6mm thick mild steel strips, hot dip galvanized GI waterstop				
		b) 150mm wide Lanko Bandage or similar approved				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.3.5.4		4) Isolation Joints in reservoir (as per drawings) measured by the total lengths of isolation joints complete with:	m	60		
		a) 10mm Jointex or softboard				
	PSG 3.11.4	b) 10x10mm polysulphide sealant to SABS 1077				
11.3.6		MISCELLANEOUS CONCRETE ITEMS				
11.3.6.1	PSG 3.11.4 PSG 8.17	500 micron black plastic bond breaker over no-fines concrete under reservoir floor	m²	200		
11.3.6.2	PSG 8.18	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	47		
11.3.6.3	PSG 8.19	Polyurethane seal between reservoir roof and walls	m	47		
11.3.6.4		Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	47		
11.3.6.5		Concrete planks to reservoir over outlet manhole to reservoir.	No	2		
11.3.6.6		Cast in situ (25MPa concrete) standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around reservoir perimeter complete (see standard detail drg)	m	52		
11.3.6.7		200gm/m2 needle punched geotextile (1m width)	m²	52		
11.3.6.8		Cleaning and sterilizing reservoir and associated pipework to Engineer's approval	Sum	1		
11.3.6.9	PSG8.15	Reservoir Watertightnes test including reservoir roof	sum	1		
11.3.6.10		Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
11.3.6.11		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				
11.3.6.12		Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
11.3.6.13		Concrete cover slab complete with manhole frame cast in, including lifting hooks and air vents. Note payment of cast iron manhole frame and cover paid seperately	No	1		
CARRIED FORWARD						

SECTION 11 : 500KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.3.6.14	PSG 8.16	"Calcimite" or similar approved step irons general purpose to BS1247:1975	No	10		
11.3.6.15	PSG 8.16	Manhole cover (to SABS 558) type 9E with frame	No	2		
11.4	SANS 1200 HA	RESERVOIR STRUCTURAL WORK				
11.4.1		STRUCTURAL STEELWORK				
	8.3.1	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
		Access ladders with Cage				
11.4.1.1		Internal 4m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
11.4.1.2		External 3.5m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
11.4.1.3		3m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
		Reservoir and Chambers' roof elements				
11.4.1.4		50mm diameter sleeved holes in reservoir roof for level control and telemetry equipment as shown on the drawings.	No	4		
11.4.1.5		100mm diameter sleeved holes in reservoir roof for sampling equipment (As required).	No	2		
11.4.1.6		Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	8		
11.4.1.7	PSG 8.16	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	PSG 8.16	Air Vents				
11.4.1.8		GMS DN150 reservoir ventilators as per detail on drawings	No	8		
		Wall-Brackets for inlet pipe as per drawing C57-304				
11.4.1.9		100x100x10mm thick end plate welded to 50mm dia pipe fixed to concrete with 4 No. M12 s/s bolts	No.	8		
11.4.1.10		1 No. M20 stainless steel bolt grade 8.8	No.	16		
11.4.1.11		1 No. M16 s/s bolt	No.	16		
11.4.1.12		50mm dia pipe 4mm wall thickness	No.	8		
11.5	SANS 1200L	RESERVOIR PIPEWORK				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
		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)				
11.5.1	8.2.5	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	PSL 8.2.1	OVERFLOW & SCOUR DRAINAGE PIPELINES				
11.5.1.1		300mm diameter uPVC Class 34 Heavy Duty Sewer Drainage Pipe	m	100		
11.5.1.2		Construct headwall complete as shown on detail drawing and build-in DN300 uPVC pipe	Sum	1		
		SPECIALS AND FITTINGS				
		All pipework to be eproxy coated and lined galavanised mild steel, 4mm wall thickness.				
		OUTLET				
11.5.1.3		P1: DN250 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end and DN550 bellmouth the other. 1100mm c/bellmouth and 2900mm C/F	No.	1		
11.5.1.4		P2: DN250 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
11.5.1.5		P3: DN250 dismantling joint	No.	1		
11.5.1.6		P4: DN250 epoxy coated and lined mild steel pipe flanged PN16 one end and plain-ended the other, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm f/plain end. Branch to be located 500mm C/Plain-end and extending 350 mm C/F	No.	1		
11.5.1.7		P5: DN100 RS gate valve flanged PN10 with non-rising spindle and handwheel	No.	1		
11.5.1.8		P6: DN100 multi-orifice anti-shock air valve as specified	No.	1		
11.5.1.9		P7: DN250 x DN200 eoxy coated and lined mild steel reducer flanged PN16 both ends	No	1		
11.5.1.10		P8: DN200 uPVC PN16 flange adaptor to suit spigot & socket uPVC pipe	No.	1		
		OVERFLOW				
11.5.1.11		P9: 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		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.5.1.12		P10: 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				
11.5.1.13		P11: DN150 Rilsan 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		
11.5.1.14		P12: DN150 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
11.5.1.15		P13: DN150 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				
11.5.1.16		P14: DN150 epoxy coated and lined mild steel puddle pipe, flanged PN16 both ends. Pipe barrel to be 600mm f/f with puddle flange 300mm from plain end.	No.	1		
11.5.1.17		P15: DN150 epoxy coated and lined mild steel 90° short radius bend, flanged PN16 both ends, 150mm c/f and 2800mm c/f.	No.	1		
11.5.1.18		P16: DN150 epoxy coated and lined mild steel pipe with 45° short radius bends each end, flanged PN16 both ends, length to suit.	No.	1		
11.5.1.19		P17: DN150 x DN200 epoxy coated and lined mild steel concentric reducer flanged each end 600mm long, PN16.	No.	1		
11.5.1.20		P17A: DN200 PN16 uPVC flange adaptor to suit spigot & socket uPVC pipe	No.	1		
11.5.1.21		P18: DN150 Direct Acting Reservoir Control Float Valve PN16 to Engineer's Approval. (design max flow: 50 l/s; Max static head (no flow): 50m)	No.	1		
11.5.2	1200LB	BEDDING (overflow and scour pipelines)				
	8.2.1 PSL 8.2.1	Provision of bedding from available sources on site				
11.5.2.1		Selected granular material	m³	20		
11.5.2.2		Selected fill material	m³	250		
	8.2.2 PSL 8.2.2	Supply only of bedding by importation (provisional)from commercial sources				
11.5.2.3		Selected granular material	m³	75		
11.5.2.4		Selected fill material	m³	150		
11.5.3	PSL 8.2.6	SUBSOIL DRAINAGE (Reservoir)				
CARRIED FORWARD						

SECTION 11 : 500KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
		Supply and lay (as detailed on drawing):				
11.5.3.1		Sand compacted to 100% Mod AASHTO	m³	40		
11.5.3.2		19mm crushed stone to reservoir perimeter	m³	80		
11.5.3.3		200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	1050		
11.5.3.4		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	500		
11.5.3.5		25mm proprietary drainage void former using premoulded HDPE or Similar Approved	m²	350		
11.6		RESERVOIR SITE WORKS				
11.6.1		RESERVOIR FENCING AND SITEWORKS				
		FENCING				
11.6.1.1		Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	150 000.00	150 000.00
11.6.1.2		Charges on profit on item 3.6.1.1 above	%	150000		
11.7		RESERVOIR ACCESS ROAD				
11.7.1	SANS 1200DM	EARTHWORKS (ROADS, SUBGRADE)				
	8.3.3b)	Road-bed preparation and compaction of material				
11.7.1.1		Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	200		
		Extra over item 3.7.1.1 :				
11.7.1.2		Process in-situ material with Lime stabiliser	m³	450		
11.7.2	SANS 1200MF	WEARING COURSE				
11.7.2.1	8.3.3a)	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	300		
11.8		MISCELLANEOUS				
11.8.1	1200DK	GABIONS AND PITCHING				
11.8.1.1	8.2.1a	Surface preparation for bedding of gabions with approved excavated material	m²	10		
11.8.1.2	8.2.2	1mx1mx2m Gabions	m³	6		
11.8.1.3	8.2.2	230mm thick reno mattress	m²	10		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
11.8.1.4	8.2.4	200grm/m2 needlepunched geofabric	m²	20		
	SANS 1200ME	Stabilizing agent				
11.8.2	8.3.8	Ordinary Portland cement (CEM 1) 3% by weight.	50kg Bags	140		
11.8.3		Lime Stabiliser	t	1.5		
TOTAL FOR SECTION 11 CARRIED FORWARD TO SUMMARY						

SECTION 12 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
12.1	SANS 1200D	EARTHWORKS				
		Site Clearance and Removal of Topsoil				
12.1.1	8.3.1	Prepare Reservoir Site	ha	0.1		
12.1.2	8.3.1.2	Remove topsoil to nominal depth of 150 mm and stockpile or dispose	m²	250		
12.1.3	SANS 1200C 8.2.9 PSC3.1	Transport and dispose of materials to suitable dumping site	m³.km	250		
12.2	SANS 1200D	EXCAVATION				
12.2.1	8.3.2	Bulk Excavation				
12.2.1.1	8.3.2(a) PSDA	Excavate in all materials to bulk excavation line (that is about 100mm above the Final Excavation Level), stockpile and maintain for backfill and dispose of remainder to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:3 and compacting)	m³	400		
	8.3.2(b)	Extra-over Item 3.2.1.1 for excavation in :				
12.2.1.2		1) Intermediate material	m³	100		
12.2.1.3		2) Hard rock material (blasting)	m³	100		
12.2.1.4		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	25		
12.2.1.5		4) Boulder material class A	m³	40		
12.2.1.6		5) Boulder material class B	m³	25		
12.2.2	8.3.4	Importing of Materials				
12.2.2.1	8.3.4(a)	Import approved topsoil from commercial source (provisional)	m³	10		
12.2.2.2	PSDA 8.3.4.2	Import approved 25 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	6		
	8.3.4(b) PSDA 8.3.4.2	Layer works To backfill over-excavation of unsuitable material:				
12.2.2.3		Supply G2 crusher run, place and compact in max 150mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	20		
12.2.2.4		Supply G5 subbase, place and compact in 150mm 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	60		
CARRIED FORWARD						

SECTION 12 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.2.2.5		Supply G5 subbase, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	20		Rate Only
12.2.2.6		Supply G7 natural gravel, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	20		
12.2.3		Finishing				
12.2.3.1	8.3.10	Topsoiling	m²	150		
12.2.3.2	8.3.11	Grassing or other Vegetation Cover	m²	100		
12.2.4	SANS 1200DA	Restricted Excavation				
12.2.4.1		Excavate in all materials by hand to expose existing services	m³	15		
	8.3.2(a)	Excavate for restricted foundations, footings and trenches in all materials and use for backfill or embankment or dispose				
12.2.4.2	PSDA4.4	Excavate and trim to lines and levels under reservoir	m³	25		
12.2.4.3	PSDA4.4	Other restricted excavation for chambers etc	m³	25		
	8.3.3(b)	Extra over items 2.3.2 for restricted excavation in:				
12.2.4.4		1) Intermediate material	m³	10		
12.2.4.5		2) Hard rock material	m³	15		
12.2.4.6		Excavate unsuitable material from below founding level as ordered by Engineer and dispose of to approved spoil site	m³	25		
12.2.5	SANS 1200DB	PIPE EXCAVATIONS				
12.2.5.1	8.3.2 PSDB 8.1.4 PSDB 8.3.3.4	(a) 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	150		
	8.3.2	(b) Extra over item 3.2.5.1 for excavation in:				
12.2.5.2		1) Intermediate material	m³	30		
12.2.5.3		2) Hard rock (Prov)	m³	40		
12.3	SANS 1200G	REINFORCED CONCRETE RESERVOIR				
12.3.1	8.1.1 8.2	FORMWORK				
	8.2.1	Rough vertical to degree of accuracy III				
12.3.1.1		Footings to walls (curved)	m²	10		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.3.1.2		Walls outside below ground level (curved)	m²	30		
12.3.1.3		Sump & encasement to pipes	m²	30		
12.3.1.4		Manholes	m²	90		
	8.2.2	Smooth vertical to degree of accuracy II				
12.3.1.5		Walls inside & outside above ground level (curved)	m²	90		
12.3.1.6		Column bases	m²	3		
12.3.1.7		Footing at expansion joint	m²	5		
12.3.1.8		Circular Columns	m²	12		
12.3.1.9		Roof slab & upstand	m²	20		
12.3.1.10		Sump	m²	15		
12.3.1.11		Manhole cover slab	m²	8		
12.3.1.12		Manholes	m²	125		
	8.2.2	Smooth horizontal to degree of accuracy II				
12.3.1.13		Roof soffit	m²	70		
12.3.1.14		Manholes	m²	15		
	8.2.6	Box-outs for pipe specials to be installed then grouted in place:				
		1) Box-out in reservoir wall to accommodate:				
12.3.1.15		a) DN100 inlet pipe	No.	1		
12.3.1.16		b) DN150 scour pipe	No.	1		
12.3.1.17		c) DN200 outlet pipe	No.	1		
12.3.1.18		d) DN200 overflow pipe	No.	1		
		2) Box-out in chamber wall to accommodate:				
12.3.1.19		a) DN150 scour pipe	No.	1		
12.3.1.20		b) DN200 outlet pipe	No.	1		
12.3.1.21		c) DN200 overflow pipe	No.	1		
		3) Box-out in reservoir roof to accommodate:				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.3.1.22		a) DN50 holes for level control and telemetry equipment	No.	4		
12.3.1.23		b) DN100 holes for sampling equipment	No.	2		
12.3.1.24		c) DN150 air vents	No.	4		
12.3.1.25		d) DN150 roof drainage outlets	No.	14		
12.3.2	8.3	REINFORCEMENT				
	8.3.1	Mild steel bars				
12.3.2.1		R8 Basic Price	t	0.8		
	8.3.1	Extra-over item 3.3.2.1 for bars of diameter				
12.3.2.2		R10	t	0.4		
	8.3.1	High-tensile steel bars				
12.3.2.3		Y25 Basic price	t	10		
	8.3.1	Extra-over item 3.3.2.3 for bars of diameter				
12.3.2.4		Y10	t	2		
12.3.2.5		Y12	t	6		
12.3.2.6		Y16	t	1.3		
12.3.2.7		Y20	t	0.4		
	8.3.2	High-Tensile Welded Mesh				
12.3.2.8		Type reference #245	m²	30		
12.3.2.9		Type reference #193	m²	6		
12.3.3	8.4 PSG 8.1.3	CONCRETE				
12.3.3.1	PSG 5.5.1.6	No-fines concrete under floor & to fill voids	m³	7		
	8.4.2	Blinding Layer (Grade 15/19 MPa)				
12.3.3.2	PSG 8.2.8	50mm blinding layer	m³	6		
12.3.3.3		5mm 1:5 Dry Mortor Mix below plastic bond breaker	m²	100		
	8.4.3	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
12.3.3.4		Walls above footing	m³	20		
12.3.3.5		Footings to walls	m³	8		
12.3.3.6		Floor slabs	m³	11		
12.3.3.7		Roof slab & upstand	m³	16		
12.3.3.8		Columns with bases	m³	1.5		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.3.3.9		Encasement to inlet / outlet / overflow / scour pipes	m³	8		
12.3.3.10		Inlet & outlet chambers (as per Drawings)	m³	20		
	8.4.3	Strength concrete: 15 MPa/19 mm				
12.3.3.11	PSG 8.2.8	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	7		
12.3.3.12		Mass concrete including splash aprons from roof overflow and filling under reservoir footings (where ordered by the Engineer)	m³	25		
	8.4.3	Strength 25MPa/19mm concrete				
12.3.3.13		25MPa/19mm concrete to benching	m³	8		
12.3.4	8.4.4 PSG 8.4.4	UNFORMED SURFACE FINISHES				
		(a) Wood-floated finish (to degree of accuracy II)				
12.3.4.1		Top of reservoir wall footing (outside)	m²	4		
12.3.4.2		Reservoir roof	m²	75		
12.3.4.3		Invert to reservoir sump	m²	5		
12.3.4.4		Top of upstand	m²	5		
		(b) Steel-floated (to degree of accuracy II)				
12.3.4.5		Top of reservoir Wall	m²	7		
12.3.4.6		Top Reservoir Floor Slab & Footing inside	m²	65		
12.3.4.7		Top of column Bases	m²	4		
12.3.5	8.5 PSG 8.5.1	JOINTS				
12.3.5.1		1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with:	m	30		
		a) 250 mm wide x 2mm thick hypalon bandage				
		b) 2mm aluminium strip with 50mm wide backing bondage breaker				
	PSG 3.11.2	c) 250mm rearguard waterstop as per detail on drawings				
		d) Closed cell Polyethylene 100kg/m or 30mm closed cell high density void former				
CARRIED FORWARD						

SECTION 12 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.3.5.2		2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with:	m	20		
		a) 200mm wide x 2 mm thick hypalon bandage or similar approved				
	PSG 3.11.2	b) 250mm rearguard waterstop with centre bulb				
12.3.5.3		3) Construction joints in reservoir walls (as per drawings) measured by the total lengths of construction joints complete with:	m	35		
	PSG 3.11.2	a) 150mm wide by 1.6mm thick mild steel strips, hot dip galvanized GI waterstop				
		b) 150mm wide Lanko Bandage or similar approved				
12.3.5.4		4) Isolation Joints in reservoir (as per drawings) measured by the total lengths of isolation joints complete with:	m	35		
		a) 10mm Jointex or softboard				
	PSG 3.11.4	b) 10x10mm polysulphide sealant to SABS 1077				
12.3.6		MISCELLANEOUS CONCRETE ITEMS				
12.3.6.1	PSG 3.11.4 PSG 8.17	500 micron plastic bond breaker over no-fines concrete under reservoir floor	m²	95		
12.3.6.2	PSG 8.18	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	30		
12.3.6.3	PSG 8.19	Polyurethane seal between reservoir roof and walls	m	30		
12.3.6.4		Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	30		
12.3.6.5		Concrete planks to reservoir over outlet manhole to reservoir.	No	2		
12.3.6.6		Cast in situ (25MPa concrete) standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around reservoir perimeter complete (see standard detail drg)	m	35		
12.3.6.7		200gm/m2 needle punched geotextile (1m width)	m²	35		
12.3.6.8	PGW5.28	Cleaning and sterilizing reservoir and associated pipework	Sum	1		
12.3.6.9	PSG8.15	Reservoir Watertightnes test including reservoir roof	sum	1		
CARRIED FORWARD						

SECTION 12 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.3.6.10		Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
12.3.6.11		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				
12.3.6.12		Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
12.3.6.13		Concrete cover slab complete with manhole frame cast in, including lifting hooks and air vents. Note payment of cast iron manhole frame and cover paid seperately	No	1		
12.3.6.14	PSG 8.16 (c)	"Calcimite" or similar approved step irons general purpose to BS1247:1975	No	10		
12.3.6.15	PSG 8.16 (a)	Manhole cover (to SABS 558) type 9E with frame	No	2		
12.4	SANS 1200 HA	RESERVOIR STRUCTURAL WORK				
12.4.1		STRUCTURAL STEELWORK				
	8.3.1	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
		Access ladders with Cage				
12.4.1.1		Internal 3.0m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
12.4.1.2		External 2.8m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
12.4.1.3		2.5m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
		Reservoir and Chambers' roof elements				
12.4.1.4		50mm diameter sleeved holes in reservoir roof for level control and telemetry equipment as shown on the drawings.	No	4		
12.4.1.5		100mm diameter sleeved holes in reservoir roof for sampling equipment (As required).	No	2		
12.4.1.6		Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	8		
12.4.1.7	PSG 8.16 (a)	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	PSG 8.16 (b)	Air Vents				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.4.1.8		GMS DN150 reservoir ventilators as per detail on drawings	No	3		
		Wall-Brackets for inlet pipe as per drawing C57-304				
12.4.1.9		100x100x10mm thick end plate welded to 50mm dia pipe fixed to concrete with 4 No. M12 s/s bolts	No.	6		
12.4.1.10		1 No. M20 stainless steel bolt grade 8.8	No.	12		
12.4.1.11		1 No. M16 s/s bolt	No.	12		
12.4.1.12		50mm dia pipe 4mm wall thickness	No.	6		
12.5	SANS 1200L	RESERVOIR PIPEWORK				
	PSL 8.2.1	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)				
12.5.1	8.2.5	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	PSL 8.2.1	OVERFLOW & SCOUR DRAINAGE PIPELINES				
12.5.1.1		300mm diameter uPVC Class 34 Heavy Duty Sewer Drainage Pipe	m	75		
12.5.1.2		Construct headwall complete as shown on detail drawing and build-in DN300 uPVC pipe	Sum	1		
		SPECIALS AND FITTINGS				
		All pipework to be eproxy coated and lined galavanised mild steel, 4mm wall thickness.				
		OUTLET				
12.5.1.3		P1: DN200 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end and DN450 bellmouth the other. 975mm c/bellmouth and 2150mm C/F	No.	1		
12.5.1.4		P2: DN200 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
12.5.1.5		P3: DN200 dismantling joint	No.	1		
12.5.1.6		P4: DN200 epoxy coated and lined mild steel pipe flanged PN16 one end and plain-ended the other, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm f/plain end. Branch to be located 500mm C/Plain-end and extending 350 mm C/F	No.	1		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.5.1.7		P5: DN100 RS gate valve flanged PN10 with non-rising spindle and handwheel	No.	1		
12.5.1.8		P6: DN100 multi-orifice anti-shock air valve as specified	No.	1		
12.5.1.9		P7: DN200 x DN90 eoxy coated and lined mild steel reducer flanged PN16 both ends	No	1		
12.5.1.10		P8: DN90 uPVC PN16 flange adaptor to suit spigot & socket uPVC pipe	No.	1		
		OVERFLOW				
12.5.1.11		P9: DN200 epoxy coated and lined mild steel pipe,buttressed flanged PN16 one end and DN350 bellmouth with 4 no. anti-vortex baffles the other end. 2420mm f/bellmouth.	No.	1		
12.5.1.12		P10: DN200 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				
12.5.1.13		P11: DN150 Rilsan coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 6400mm c/f.	No.	1		
12.5.1.14		P12: DN150 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
12.5.1.15		P13: DN150 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				
12.5.1.16		P14: DN100 epoxy coated and lined mild steel puddle pipe, flanged PN16 both ends. Pipe barrel to be 600mm f/f with puddle flange 300mm from plain end.	No.	1		
12.5.1.17		P15: DN100 epoxy coated and lined mild steel 90° short radius bend, flanged PN16 both ends, 150mm c/f and 2800mm c/f.	No.	1		
12.5.1.18		P16: DN100 epoxy coated and lined mild steel pipe with 45° short radius bends each end, flanged PN16 both ends, length to suit.	No.	1		
12.5.1.19		P17: DN100 x DN90 epoxy coated and lined mild steel concentric reducer flanged each end 600mm long, PN16.	No.	1		
12.5.1.20		P17A: DN90 PN16 uPVC flange adaptor.	No.	1		
CARRIED FORWARD						

SECTION 12 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.5.1.21		P18: DN100 Direct Acting Reservoir Control Float Valve PN16 to Engineer's Approval. (design max flow: 50 l/s; Max static head (no flow): 50m)	No.	1		
12.5.2	1200LB	BEDDING (overflow and scour pipelines)				
	8.2.1 PSL 8.2.1	Provision of bedding from available sources on site				
12.5.2.1		Selected granular material	m³	20		
12.5.2.2		Selected fill material	m³	200		
	8.2.2 PSL 8.2.2	Supply only of bedding by importation (provisional)from commercial sources				
12.5.2.3		Selected granular material	m³	50		
12.5.2.4		Selected fill material	m³	100		
12.5.3	PSL 8.2.6	SUBSOIL DRAINAGE (Reservoir)				
		Supply and lay (as detailed on drawing):				
12.5.3.1		Sand compacted to 100% Mod AASHTO	m³	25		
12.5.3.2		19mm crushed stone to reservoir perimeter	m³	65		
12.5.3.3		200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	700		
12.5.3.4		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	100		
12.5.3.5		25mm proprietary drainage void former using premoulded HDPE or Similar Approved	m²	175		
12.6	SANS 1200X	RESERVOIR SITE WORKS				
12.6.1		RESERVOIR FENCING AND SITEWORKS				
		FENCING				
12.6.1.1		Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	100 000.00	100 000.00
12.6.1.2		Charges on profit on item 3.6.1.1 above	%	100000		
12.7		RESERVOIR ACCESS ROAD				
12.7.1	SANS 1200DM	EARTHWORKS (ROADS, SUBGRADE)				
	8.3.3b)	Road-bed preparation and compaction of material				
CARRIED FORWARD						

SECTION 12 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
12.7.1.1		Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	150		
		Extra over item 3.7.1.1 :				
12.7.1.2		Process in-situ material with Lime stabiliser	m³	350		
12.7.2	SANS 1200MF	WEARING COURSE				
12.7.2.1	8.3.3a)	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	250		
12.8		MISCELLANEOUS				
12.8.1	1200DK	GABIONS AND PITCHING				
12.8.1.1	8.2.1a	Surface preparation for bedding of gabions with approved excavated material	m²	10		
12.8.1.2	8.2.2	1mx1mx2m Gabions	m³	6		
12.8.1.3	8.2.2	230mm thick reno mattress	m²	10		
12.8.1.4	8.2.4	200grm/m2 needlepunched geofabric	m²	20		
	SANS 1200ME	Stabilizing agent				
12.8.2	8.3.8	Ordinary Portland cement (CEM 1) 3% by weight.	50kg Bags	60		
12.8.3		Lime Stabiliser	t	1.5		
TOTAL FOR SECTION 12 CARRIED FORWARD TO SUMMARY						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
13.1	SANS 1200D	EARTHWORKS				
		Site Clearance and Removal of Topsoil				
13.1.1	8.3.1	Prepare Reservoir Site	ha	0.1		
13.1.2	8.3.1.2	Remove topsoil to nominal depth of 150 mm and stockpile or dispose	m²	250		
13.1.3	SANS 1200C 8.2.9 PSC3.1	Transport and dispose of materials to suitable dumping site	m³.km	250		
13.2	SANS 1200D	EXCAVATION				
13.2.1	8.3.2	Bulk Excavation				
13.2.1.1	8.3.2(a) PSDA	Excavate in all materials to bulk excavation line (that is about 100mm above the Final Excavation Level), stockpile and maintain for backfill and dispose of remainder to approved spoil site (including shaping to be free-draining and with embankment slopes shallower than 1:3 and compacting)	m³	400		
	8.3.2(b)	Extra-over Item 3.2.1.1 for excavation in :				
13.2.1.2		1) Intermediate material	m³	100		
13.2.1.3		2) Hard rock material (blasting)	m³	100		
13.2.1.4		3) Hard rock excavation near residential buildings (Mounted hydraulic breaker where directed by the Engineer)	m³	25		
13.2.1.5		4) Boulder material class A	m³	40		
13.2.1.6		5) Boulder material class B	m³	25		
13.2.2	8.3.4	Importing of Materials				
13.2.2.1	8.3.4(a)	Import approved topsoil from commercial source (provisional)	m³	10		
13.2.2.2	PSDA 8.3.4.2	Import approved 25 mm stone chips (reflective quatzite) from commercial source, stockpile and place by hand on reservoir roof	m³	6		
	8.3.4(b) PSDA 8.3.4.2	Layer works To backfill over-excavation of unsuitable material:				
13.2.2.3		Supply G2 crusher run, place and compact in max 150mm layers under reservoir (Prov) compacted to 100% mod AASHTO density	m³	20		
13.2.2.4		Supply G5 subbase, place and compact in 150mm 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	60		
CARRIED FORWARD						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.2.2.5		Supply G5 subbase, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	20		Rate Only
13.2.2.6		Supply G7 natural gravel, place and compact in 150mm layers under reservoir (Prov) compacted to 95% mod AASHTO density	m³	20		
13.2.3		Finishing				
13.2.3.1	8.3.10	Topsoiling	m²	150		
13.2.3.2	8.3.11	Grassing or other Vegetation Cover	m²	100		
13.2.4	SANS 1200DA	Restricted Excavation				
13.2.4.1		Excavate in all materials by hand to expose existing services	m³	15		
	8.3.2(a)	Excavate for restricted foundations, footings and trenches in all materials and use for backfill or embankment or dispose				
13.2.4.2	PSDA4.4	Excavate and trim to lines and levels under reservoir	m³	25		
13.2.4.3	PSDA4.4	Other restricted excavation for chambers etc	m³	25		
	8.3.3(b)	Extra over items 2.3.2 for restricted excavation in:				
13.2.4.4		1) Intermediate material	m³	10		
13.2.4.5		2) Hard rock material	m³	15		
13.2.4.6		Excavate unsuitable material from below founding level as ordered by Engineer and dispose of to approved spoil site	m³	25		
13.2.5	SANS 1200DB	PIPE EXCAVATIONS				
13.2.5.1	8.3.2 PSDB 8.1.4 PSDB 8.3.3.4	(a) 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	150		
	8.3.2	(b) Extra over item 3.2.5.1 for excavation in:				
13.2.5.2		1) Intermediate material	m³	30		
13.2.5.3		2) Hard rock (Prov)	m³	40		
13.3	SANS 1200G	REINFORCED CONCRETE RESERVOIR				
13.3.1	8.1.1 8.2	FORMWORK				
	8.2.1	Rough vertical to degree of accuracy III				
13.3.1.1		Footings to walls (curved)	m²	10		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.3.1.2		Walls outside below ground level (curved)	m²	30		
13.3.1.3		Sump & encasement to pipes	m²	30		
13.3.1.4		Manholes	m²	90		
	8.2.2	Smooth vertical to degree of accuracy II				
13.3.1.5		Walls inside & outside above ground level (curved)	m²	90		
13.3.1.6		Column bases	m²	3		
13.3.1.7		Footing at expansion joint	m²	5		
13.3.1.8		Circular Columns	m²	12		
13.3.1.9		Roof slab & upstand	m²	20		
13.3.1.10		Sump	m²	15		
13.3.1.11		Manhole cover slab	m²	8		
13.3.1.12		Manholes	m²	125		
	8.2.2	Smooth horizontal to degree of accuracy II				
13.3.1.13		Roof soffit	m²	70		
13.3.1.14		Manholes	m²	15		
	8.2.6	Box-outs for pipe specials to be installed then grouted in place:				
		1) Box-out in reservoir wall to accommodate:				
13.3.1.15		a) DN100 inlet pipe	No.	1		
13.3.1.16		b) DN150 scour pipe	No.	1		
13.3.1.17		c) DN200 outlet pipe	No.	1		
13.3.1.18		d) DN200 overflow pipe	No.	1		
		2) Box-out in chamber wall to accommodate:				
13.3.1.19		a) DN150 scour pipe	No.	1		
13.3.1.20		b) DN200 outlet pipe	No.	1		
13.3.1.21		c) DN200 overflow pipe	No.	1		
		3) Box-out in reservoir roof to accommodate:				
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.3.1.22		a) DN50 holes for level control and telemetry equipment	No.	4		
13.3.1.23		b) DN100 holes for sampling equipment	No.	2		
13.3.1.24		c) DN150 air vents	No.	4		
13.3.1.25		d) DN150 roof drainage outlets	No.	14		
13.3.2	8.3	REINFORCEMENT				
	8.3.1	Mild steel bars				
13.3.2.1		R8 Basic Price	t	0.8		
	8.3.1	Extra-over item 3.3.2.1 for bars of diameter				
13.3.2.2		R10	t	0.4		
	8.3.1	High-tensile steel bars				
13.3.2.3		Y25 Basic price	t	10		
	8.3.1	Extra-over item 3.3.2.3 for bars of diameter				
13.3.2.4		Y10	t	2		
13.3.2.5		Y12	t	6		
13.3.2.6		Y16	t	1.3		
13.3.2.7		Y20	t	0.4		
	8.3.2	High-Tensile Welded Mesh				
13.3.2.8		Type reference #245	m²	30		
13.3.2.9		Type reference #193	m²	6		
13.3.3	8.4 PSG 8.1.3	CONCRETE				
13.3.3.1	PSG 5.5.1.6	No-fines concrete under floor & to fill voids	m³	7		
	8.4.2	Blinding Layer (Grade 15/19 MPa)				
13.3.3.2	PSG 8.2.8	50mm blinding layer	m³	6		
13.3.3.3		5mm 1:5 Dry Mortor Mix below plastic bond breaker	m²	100		
	8.4.3	Strength concrete: 35MPa/19 mm watertight concrete with an approved crystalline waterproofing concrete additive				
13.3.3.4		Walls above footing	m³	20		
13.3.3.5		Footings to walls	m³	8		
13.3.3.6		Floor slabs	m³	11		
13.3.3.7		Roof slab & upstand	m³	16		
13.3.3.8		Columns with bases	m³	1.5		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.3.3.9		Encasement to inlet / outlet / overflow / scour pipes	m³	8		
13.3.3.10		Inlet & outlet chambers (as per Drawings)	m³	20		
	8.4.3	Strength concrete: 15 MPa/19 mm				
13.3.3.11	PSG 8.2.8	Minimum thickness 75 mm blinding layer to chambers and encasements	m³	7		
13.3.3.12		Mass concrete including splash aprons from roof overflow and filling under reservoir footings (where ordered by the Engineer)	m³	25		
	8.4.3	Strength 25MPa/19mm concrete				
13.3.3.13		25MPa/19mm concrete to benching	m³	8		
13.3.4	8.4.4 PSG 8.4.4	UNFORMED SURFACE FINISHES				
		(a) Wood-floated finish (to degree of accuracy II)				
13.3.4.1		Top of reservoir wall footing (outside)	m²	4		
13.3.4.2		Reservoir roof	m²	75		
13.3.4.3		Invert to reservoir sump	m²	5		
13.3.4.4		Top of upstand	m²	5		
		(b) Steel-floated (to degree of accuracy II)				
13.3.4.5		Top of reservoir Wall	m²	7		
13.3.4.6		Top Reservoir Floor Slab & Footing inside	m²	65		
13.3.4.7		Top of column Bases	m²	4		
13.3.5	8.5 PSG 8.5.1	JOINTS				
13.3.5.1		1) Expansion Joints in reservoir floor against wall footing (as per drawings) measured by the total lengths of expansion joints complete with:	m	30		
		a) 250 mm wide x 2mm thick hypalon bandage				
		b) 2mm aluminium strip with 50mm wide backing bondage breaker				
	PSG 3.11.2	c) 250mm rearguard waterstop as per detail on drawings				
		d) Closed cell Polyethylene 100kg/m or 30mm closed cell high density void former				
CARRIED FORWARD						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.3.5.2		2) Contraction joints in reservoir floor (as per drawings) measured by the total lengths of contraction joints complete with:	m	20		
		a) 200mm wide x 2 mm thick hypalon bandage or similar approved				
	PSG 3.11.2	b) 250mm rearguard waterstop with centre bulb				
13.3.5.3		3) Construction joints in reservoir walls (as per drawings) measured by the total lengths of construction joints complete with:	m	35		
	PSG 3.11.2	a) 150mm wide by 1.6mm thick mild steel strips, hot dip galvanized GI waterstop				
		b) 150mm wide Lanko Bandage or similar approved				
13.3.5.4		4) Isolation Joints in reservoir (as per drawings) measured by the total lengths of isolation joints complete with:	m	35		
		a) 10mm Jointex or softboard				
	PSG 3.11.4	b) 10x10mm polysulphide sealant to SABS 1077				
13.3.6		MISCELLANEOUS CONCRETE ITEMS				
13.3.6.1	PSG 3.11.4 PSG 8.17	500 micron plastic bond breaker over no-fines concrete under reservoir floor	m²	95		
13.3.6.2	PSG 8.18	Neoprene (Kilcher or similar approved) Teflon sliding bearing type 3T50/75	m	30		
13.3.6.3	PSG 8.19	Polyurethane seal between reservoir roof and walls	m	30		
13.3.6.4		Precast 220x70 deep x790 long saddleback Deranco coping (or similar approved) to reservoir roof complete installation including casting shuttering and placing on mortar.	m	30		
13.3.6.5		Concrete planks to reservoir over outlet manhole to reservoir.	No	2		
13.3.6.6		Cast in situ (25MPa concrete) standard 1000mm wide v-channelling around reservoir perimeter on 200gm/m2 needle punched geotextile around reservoir perimeter complete (see standard detail drg)	m	35		
13.3.6.7		200gm/m2 needle punched geotextile (1m width)	m²	35		
13.3.6.8	PGW5.28	Cleaning and sterilizing reservoir and associated pipework	Sum	1		
13.3.6.9	PSG8.15	Reservoir Watertightnes test including reservoir roof	sum	1		
CARRIED FORWARD						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.3.6.10		Supply and install "Pulltrude" type fibreglass 25 deep 36x36 grating panel 650x1000mm	No	1		
13.3.6.11		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				
13.3.6.12		Concrete cover slab without manhole,including lifting hooks and air vents.	No	1		
13.3.6.13		Concrete cover slab complete with manhole frame cast in, including lifting hooks and air vents. Note payment of cast iron manhole frame and cover paid seperately	No	1		
13.3.6.14	PSG 8.16 (c)	"Calcimite" or similar approved step irons general purpose to BS1247:1975	No	10		
13.3.6.15	PSG 8.16 (a)	Manhole cover (to SABS 558) type 9E with frame	No	2		
13.4	SANS 1200 HA	RESERVOIR STRUCTURAL WORK				
13.4.1		STRUCTURAL STEELWORK				
	8.3.1	Supply, fabricate, deliver and install steelwork,to the finishes/coatings specified in the specification and on the drawings				
		Access ladders with Cage				
13.4.1.1		Internal 3.0m high ladder to reservoir as per drawings. Stainless steel grade 316L	No	1		
13.4.1.2		External 2.8m high GMS ladder to outer wall of reservoir as per drawings (HD Galvanised)	No	1		
13.4.1.3		2.5m high GMS ladder to inlet & outlet chambers as per drawings	No	2		
		Reservoir and Chambers' roof elements				
13.4.1.4		50mm diameter sleeved holes in reservoir roof for level control and telemetry equipment as shown on the drawings.	No	4		
13.4.1.5		100mm diameter sleeved holes in reservoir roof for sampling equipment (As required).	No	2		
13.4.1.6		Supply and install GMS manhole locking bar (reservoir roof) as per drawing details	No	8		
13.4.1.7	PSG 8.16 (a)	Supply and install 600x600 GMS hinged manhole cover and frame to chambers as per standard detail drawing complete.	No	2		
	PSG 8.16 (b)	Air Vents				
CARRIED FORWARD						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.4.1.8		GMS DN150 reservoir ventilators as per detail on drawings	No	3		
		Wall-Brackets for inlet pipe as per drawing C57-304				
13.4.1.9		100x100x10mm thick end plate welded to 50mm dia pipe fixed to concrete with 4 No. M12 s/s bolts	No.	6		
13.4.1.10		1 No. M20 stainless steel bolt grade 8.8	No.	12		
13.4.1.11		1 No. M16 s/s bolt	No.	12		
13.4.1.12		50mm dia pipe 4mm wall thickness	No.	6		
13.5	SANS 1200L	RESERVOIR PIPEWORK				
	PSL 8.2.1	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)				
13.5.1	8.2.5	INLET, OUTLET, SCOUR & OVERFLOW SPECIALS AND FITTINGS				
	PSL 8.2.1	OVERFLOW & SCOUR DRAINAGE PIPELINES				
13.5.1.1		300mm diameter uPVC Class 34 Heavy Duty Sewer Drainage Pipe	m	75		
13.5.1.2		Construct headwall complete as shown on detail drawing and build-in DN300 uPVC pipe	Sum	1		
		SPECIALS AND FITTINGS				
		All pipework to be eproxy coated and lined galavanised mild steel, 4mm wall thickness.				
		OUTLET				
13.5.1.3		P1: DN200 epoxy coated and lined mild steel short radius 90° bend. Flanged, PN16 one end and DN450 bellmouth the other. 975mm c/bellmouth and 2150mm C/F	No.	1		
13.5.1.4		P2: DN200 PN16 flanged double off-set butterfly valve with gearbox and handle wheel	No.	1		
13.5.1.5		P3: DN200 dismantling joint	No.	1		
13.5.1.6		P4: DN200 epoxy coated and lined mild steel pipe flanged PN16 one end and plain-ended the other, with DN100 flanged PN10 branch. Pipe barrel to be 1800mm f/plain end. Branch to be located 500mm C/Plain-end and extending 350 mm C/F	No.	1		
CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.5.1.7		P5: DN100 RS gate valve flanged PN10 with non-rising spindle and handwheel	No.	1		
13.5.1.8		P6: DN100 multi-orifice anti-shock air valve as specified	No.	1		
13.5.1.9		P7: DN200 x DN90 eoxy coated and lined mild steel reducer flanged PN16 both ends	No	1		
13.5.1.10		P8: DN90 uPVC PN16 flange adaptor to suit spigot & socket uPVC pipe	No.	1		
		OVERFLOW				
13.5.1.11		P9: DN200 epoxy coated and lined mild steel pipe,buttressed flanged PN16 one end and DN350 bellmouth with 4 no. anti-vortex baffles the other end. 2420mm f/bellmouth.	No.	1		
13.5.1.12		P10: DN200 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				
13.5.1.13		P11: DN150 Rilsan coated and lined short radius 90° bend. Flanged PN10 one end and DN250 bellmouth the other. 750mm c/bellmouth and 6400mm c/f.	No.	1		
13.5.1.14		P12: DN150 clockwise closing non-rising spindle flanged wedge gate valve to SANS 664.	No.	1		
13.5.1.15		P13: DN150 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				
13.5.1.16		P14: DN100 epoxy coated and lined mild steel puddle pipe, flanged PN16 both ends. Pipe barrel to be 600mm f/f with puddle flange 300mm from plain end.	No.	1		
13.5.1.17		P15: DN100 epoxy coated and lined mild steel 90° short radius bend, flanged PN16 both ends, 150mm c/f and 2800mm c/f.	No.	1		
13.5.1.18		P16: DN100 epoxy coated and lined mild steel pipe with 45° short radius bends each end, flanged PN16 both ends, length to suit.	No.	1		
13.5.1.19		P17: DN100 x DN90 epoxy coated and lined mild steel concentric reducer flanged each end 600mm long, PN16.	No.	1		
13.5.1.20		P17A: DN90 PN16 uPVC flange adaptor.	No.	1		
CARRIED FORWARD						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.5.1.21		P18: DN100 Direct Acting Reservoir Control Float Valve PN16 to Engineer's Approval. (design max flow: 50 l/s; Max static head (no flow): 50m)	No.	1		
13.5.2	1200LB	BEDDING (overflow and scour pipelines)				
	8.2.1 PSL 8.2.1	Provision of bedding from available sources on site				
13.5.2.1		Selected granular material	m³	20		
13.5.2.2		Selected fill material	m³	200		
	8.2.2 PSL 8.2.2	Supply only of bedding by importation (provisional)from commercial sources				
13.5.2.3		Selected granular material	m³	50		
13.5.2.4		Selected fill material	m³	100		
13.5.3	PSL 8.2.6	SUBSOIL DRAINAGE (Reservoir)				
		Supply and lay (as detailed on drawing):				
13.5.3.1		Sand compacted to 100% Mod AASHTO	m³	25		
13.5.3.2		19mm crushed stone to reservoir perimeter	m³	65		
13.5.3.3		200gr/m² needle punched geofabric to subsurface drains (bidim)	m²	700		
13.5.3.4		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	100		
13.5.3.5		25mm proprietary drainage void former using premoulded HDPE or Similar Approved	m²	175		
13.6	SANS 1200X	RESERVOIR SITE WORKS				
13.6.1		RESERVOIR FENCING AND SITEWORKS				
		FENCING				
13.6.1.1		Supply and install fencing around reservoir and pumpstation complete with gates (3 quotes from local contractors to be arranged)	Prov Sum	1	100 000.00	100 000.00
13.6.1.2		Charges on profit on item 3.6.1.1 above	%	100000		
13.7		RESERVOIR ACCESS ROAD				
13.7.1	SANS 1200DM	EARTHWORKS (ROADS, SUBGRADE)				
	8.3.3b)	Road-bed preparation and compaction of material				
CARRIED FORWARD						

SECTION 13 : 150KL RESERVOIR

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
		BROUGHT FORWARD				
13.7.1.1		Scarify and compact in-situ material and compact to 93% Mod AASHTO density in 150 mm layer (Prov)	m³	150		
		Extra over item 3.7.1.1 :				
13.7.1.2		Process in-situ material with Lime stabiliser	m³	350		
13.7.2	SANS 1200MF	WEARING COURSE				
13.7.2.1	8.3.3a)	Import G5 wearing course material,place and compact to 95% Mod AASHTO in a 150mm layer	m³	250		
13.8		MISCELLANEOUS				
13.8.1	1200DK	GABIONS AND PITCHING				
13.8.1.1	8.2.1a	Surface preparation for bedding of gabions with approved excavated material	m²	10		
13.8.1.2	8.2.2	1mx1mx2m Gabions	m³	6		
13.8.1.3	8.2.2	230mm thick reno mattress	m²	10		
13.8.1.4	8.2.4	200grm/m2 needlepunched geofabric	m²	20		
	SANS 1200ME	Stabilizing agent				
13.8.2	8.3.8	Ordinary Portland cement (CEM 1) 3% by weight.	50kg Bags	60		
13.8.3		Lime Stabiliser	t	1.5		
TOTAL FOR SECTION 13 CARRIED FORWARD TO SUMMARY						

SECTION 14 : SUBCONTRACTOR'S SCOPE

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
14.1	C3.3.2.1	Scope of mandatory subcontract works	Sum	1	11 840 000....	11 840 000.00
TOTAL FOR SECTION 14 CARRIED FORWARD TO SUMMARY						

SUMMARY OF BILL OF QUANTITIES

		AMOUNT
SECTION 1	SABS 1200 A - GENERAL	
SECTION 2	SABS 1200 C - SITE CLEARANCE	
SECTION 3	SABS 1200 D - EARTHWORKS	
SECTION 4	SABS 1200 DB - PIPE TRENCHES	
SECTION 5	SABS 1200 DK – GABIONS AND PITCHING	
SECTION 6	SABS 1200 L - MEDIUM-PRESSURE PIPELINES	
SECTION 7	SABS 1200 LB - BEDDING: (PIPES)	
SECTION 8	1 ML RESERVOIR	
SECTION 9	200KL RESERVOIR	
SECTION 10	250KL RESERVOIR	
SECTION 11	500KL RESERVOIR	
SECTION 12	150KL RESERVOIR	
SECTION 13	150KL RESERVOIR	
SECTION 14	SUBCONTRACTOR'S SCOPE	

NETT TOTAL OF TENDER **……..**

ALLOWANCE FOR CONTINGENCIES (10% OF SUBTOTAL) **……..**
(to be spend as the Engineering may direct and to be deducted in whole or in part it not required)

TOTAL INCLUDING CONTINGENCIES **……..**

ALLOWANCE FOR CONTRACT PRICE ADJUSTMENT (6%) **……..**

TOTAL INCLUDING CONTRACT PRICE ADJUSTMENT **……..**

ALLOWANCE FOR VAT 15% **……..**

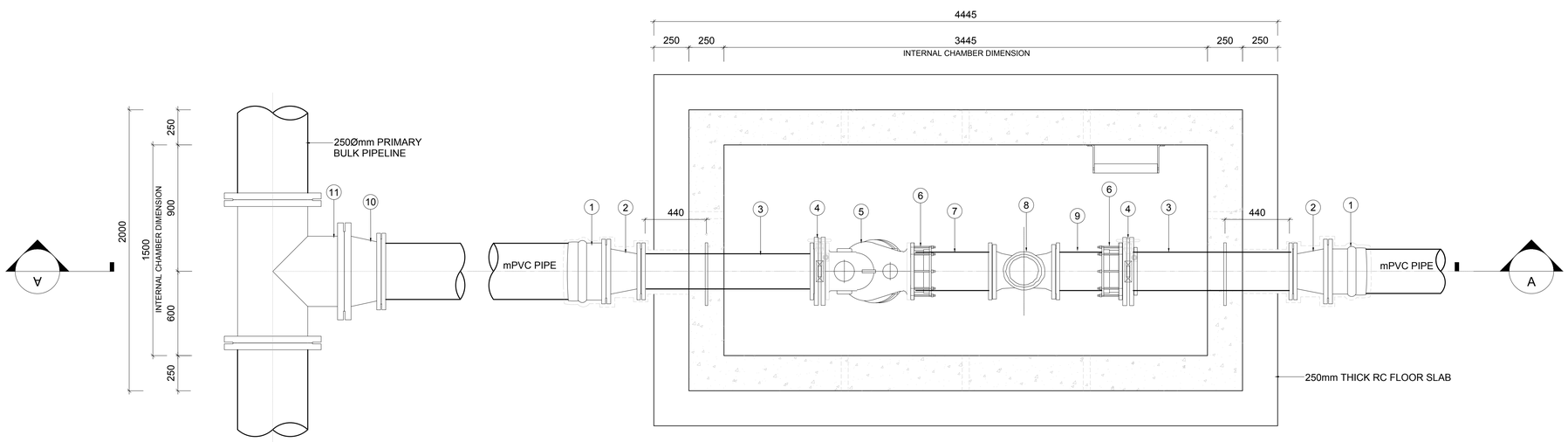
GROSS TOTAL CARRIED TO PART C1.1 FORM OF OFFER & ACCEPTANCE **……..**

TIME FOR COMPLETION OF CONTRACT (not to exceed 52 weeks) **…… weeks**

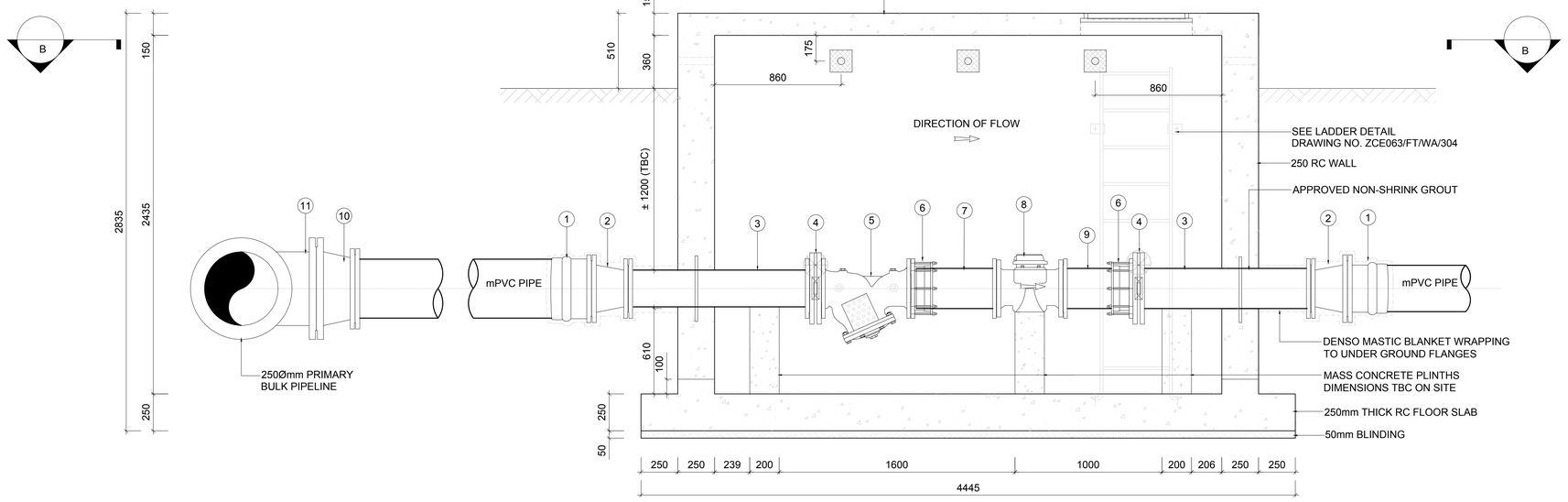
SIGNED BY/ON BEHALF OF TENDERER

NAME	**SIGNATURE**	**DATE**

COMPANY STAMP

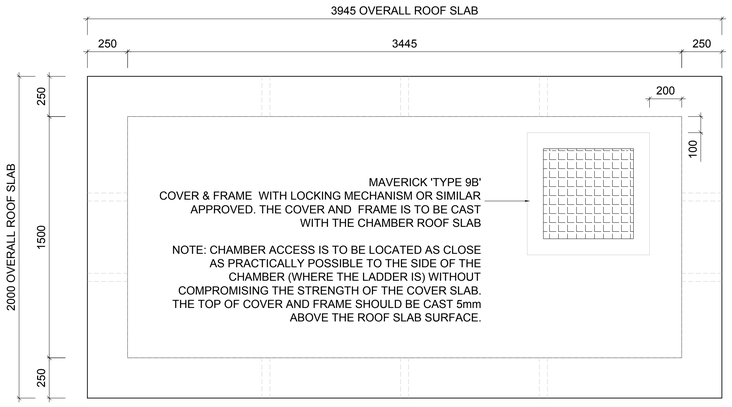


SECTION "B-B"



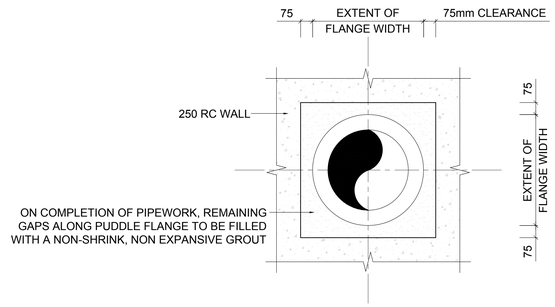
SECTION "A-A"

SCALE 1:20



PLAN VIEW - OFF-TAKE CHAMBER COVER SLAB

SCALE 1:20



TYPICAL BOX OUT DETAIL

SCALE 1:20

NOTE:

ASSUME 0.1 TONS STEEL PER m^3 OF CONCRETE

ABRV.	DESCRIPTION	SKETCH
F.A.E.	FLANGED ONE END	
F.B.E.	FLANGED BOTH ENDS	
F.A.E.	FLANGED ALL ENDS.	

110mm Ø uPVC SCHEDULE TABLE

ITEM	NOMINAL DIAMETER	QTY	DESCRIPTION	SKETCH	PN
1	110	2	CI FLANGE ADAPTOR		16
2	110 X 90	2	GMS FLANGED REDUCER	± 180	16
3	90	2	GMS PIPE, F.B.E. 1290mm LONG WITH PUDDLE FLANGE 410mm FROM ONE END.	440 / 1290	16
4	90	2	FLANGED AMRI BUTTERFLY VALVE, OR SIMILAR APPROVED, ±56mm WIDTH		16
5	90	1	FLANGED BERMAD STRAINER OR SIMILAR APPROVED, ±415mm FLANGE TO FLANGE		16
6	90	2	VJ FLANGE ADAPTOR, OR SIMILAR APPROVED		16
7	90	1	GMS PIPE, 830mm LONG, F.O.E	830	16
8	90	1	FLANGED SENSUS WATER METER OR SIMILAR APPROVED, ±300mm LONG		16
9	90	1	GMS PIPE, 520mm LONG, F.O.E	520	16
10	500 X 400	1	GMS FLANGED REDUCER	± 200	16
11	500 X 500	1	GMS EQUAL TEE, F.A.E	1020 / 510	16

160mm Ø uPVC SCHEDULE TABLE

ITEM	NOMINAL DIAMETER	QTY	DESCRIPTION	SKETCH	PN
1	160	2	CI FLANGE ADAPTOR		16
2	160 X 110	2	GMS FLANGED REDUCER	± 180	16
3	110	2	GMS PIPE, F.B.E. 1290mm LONG WITH PUDDLE FLANGE 410mm FROM ONE END.	440 / 1290	16
4	110	2	FLANGED AMRI BUTTERFLY VALVE, OR SIMILAR APPROVED, ±56mm WIDTH		16
5	110	1	FLANGED BERMAD STRAINER OR SIMILAR APPROVED, ±415mm FLANGE TO FLANGE		16
6	110	2	VJ FLANGE ADAPTOR, OR SIMILAR APPROVED		16
7	110	1	GMS PIPE, 830mm LONG, F.O.E	830	16
8	110	1	FLANGED SENSUS WATER METER OR SIMILAR APPROVED, ±300mm LONG		16
9	110	1	GMS PIPE, 520mm LONG, F.O.E	520	16
10	500 X 400	1	GMS FLANGED REDUCER	± 200	16
11	500 X 500	1	GMS EQUAL TEE, F.A.E	1020 / 510	16

CHAMBER NOTES:

1. ALL WORK IN ACCORDANCE WITH THE RELEVANT SECTIONS OF SANS 1200.
2. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
3. ALL PIPE FITTINGS TO BE CHECKED ON SITE. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER PRIOR TO MANUFACTURE
4. ALL PIPEWORK TO BE GMS UNLESS STATED OTHERWISE.
5. ALL FLANGES SHALL BE RATED AND DRILLED TO SABS 1123.
6. ALL BOLTS TO BE HOT-DIPPED GALVANISED
7. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT CIVIL MECHANICAL DRAWINGS.
8. ALL BURIED FLANGES AND FITTINGS TO BE WRAPPED IN "DENSO MASTIC" BLANKET WRAPPING.
9. ALL CONCRETE IS TO BE GRADE 25/19 UNLESS STATED OTHERWISE

CONCRETE NOTES:

1. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
2. FOUNDATION EXCAVATIONS TO BE APPROVED BY THE STRUCTURAL / GEOTECHNICAL ENGINEER.
3. REINFORCING TO BE CHECKED BY THE ENGINEER.
4. CONCRETE STRENGTHS @ 28 DAYS:
   BLINDING : 15 MPa
   BASES : 25 MPa
   SLABS : 30 MPa
   WALLS : 25 MPa
5. COVER TO STEEL REINFORCING:
   CHAMBER : 40mm
6. ALL SHARP EXPOSED EDGES TO BE CHAMFERED 20 x 20mm.

Ziinzame Consulting Engineers (Pty) Ltd.
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Sub-Consultant:
GIBB

TENDER DRAWING

DATE : 03-11-2020

SIGNED BY :

CONSULTING ENGINEER

REV	DATE	DESCRIPTION	BY	CHK

DRG. NO. REFERENCE DRAWINGS

CLIENT LOGO

O.R. TAMBO DISTRICT MUNICIPALITY

CLIENT NAME

O.R. TAMBO DISTRICT MUNICIPALITY

PROJECT TITLE

MQANDULI SECONDARY BULK WATER SUPPLY PHASE 2

CONTRACT 5

DRAWING TITLE

OFF-TAKE CHAMBER DETAILS

	RESPONSIBLE PERSON	DATE
DESIGNED	M.NDABANKULU	03-11-2020
CHECKED	V.MWAFUKA	03-11-2020
DRAWN	D.GENGAN	03-11-2020
CHECKED	V. MWAFUKA	03-11-2020

SCALES	AS SHOWN	SHEET SIZE	A0

DRAWING NO.		REVISION
ZCE 063/FT/WA/C5	311	1