	Brought Forward				R
20	Brick manhole 1380 x 920mm internally exceeding 1250mm and not exceeding 1500mm deep internally comprising suitable 2340 x 1880 x 250mm thick 25MPa/26mm unreinforced concrete base, 230mm brickwork of NFX clay bricks (14 MPa nominal compressive strength) in class I mortar, 1840 x 1380 x 200mm thick 25Mpa/26mm reinforced concrete cover slab with Y10 high tensile steel bars at 150mm centres set in both directions and rebated opening to accommodate cover and frame (cover and frame elsewhere measured) including all excavation, backfilling, formwork etc. all in accordance to Type A, annexured to these Bills of Quantities for the full details, drawing number: TGC/03. **(LI)**	No	5		
21	Brick manhole 1380 x 920mm internally exceeding 1500mm and not exceeding 1750mm deep internally comprising suitable 2340 x 1880 x 250mm thick 25MPa/26mm unreinforced concrete base, 230mm brickwork of NFX clay bricks (14 MPa nominal compressive strength) in class I mortar, 1840 x 1380 x 200mm thick 25Mpa/26mm reinforced concrete cover slab with Y10 high tensile steel bars at 150mm centres set in both directions and rebated opening to accommodate cover and frame (cover and frame elsewhere measured) including all excavation, backfilling, formwork etc. all in accordance to Type A, annexured to these Bills of Quantities for the full details, drawing number: TGC/03. **(LI)**	No	1		
22	Brick manhole 1380 x 920mm internally exceeding 1750mm and not exceeding 2000mm deep internally comprising suitable 2340 x 1880 x 250mm thick 25MPa/26mm unreinforced concrete base, 230mm brickwork of NFX clay bricks (14 MPa nominal compressive strength) in class I mortar, 1840 x 1380 x 200mm thick 25Mpa/26mm reinforced concrete cover slab with Y10 high tensile steel bars at 150mm centres set in both directions and rebated opening to accommodate cover and frame (cover and frame elsewhere measured) including all excavation, backfilling, formwork etc. all in accordance to Type A, annexured to these Bills of Quantities for the full details, drawing number: TGC/03. **(LI)**	No	2		
	Carried Forward				R

Bill No. 18
External Works

	Brought Forward			R
	Kerb inlets for stormwater manholes (gratings and covers elsewhere)			
23	Kerbside storm water inlet, overall size 3660 x 1220mm externally not exceeding 1500mm and not exceeding 1750mm deep to invert comprising, 250mm thick 25Mpa/19mm reinforced concrete base, 230mm brickwork of NFX clay bricks (14 MPa nominal compressive strength) in class I mortar, and 100mm thick precast concrete cover complete with excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material , shoring benching, haunching, etc. all in accordance to Type D3, annexured to these Bills of Quantities for the full details, drawing number: TGC/04. **(LI)**	No	2	
	Attenuation Tank			
24	Two (2) compartment attenuation tank approximate size 1710 x 740mm internally and not exceeding 1000mm deep internally comprising of 2370 x 1400 x 250mm thick 30MPa/19mm unreinforced concrete base, 230mm brickwork of NFX clay bricks (14 MPa nominal compressive strength) in class I mortar, 2170 x 1200 x 100mm thick 30Mpa/19mm reinforced concrete cover slab with Y12 high tensile steel bars at 150mm centres set in both directions and two rebated openings to accommodate cover and frame (cover and frame elsewhere measured) including all excavation, backfilling, formwork etc. all in accordance to Type 3, annexured to these Bills of Quantities for the full details, drawing number: 51660. **(LI)**	No	1	
25	Cementitious waterproofing system in two coats and reinforced with a non-woven propylene membrane to the inside floor and walls of the Attenuation tank	m2	7	
	Gratings, covers, etc			
26	Light duty precast concrete 550mm diameter cover and cover slab approximate size 1010 x 1010mm all in accordance to Type A, annexured to these Bills of Quantities for the full details, drawing number: TGC/03.	No	18	
27	Heavy duty precast concrete 550mm diameter cover and cover slab approximate size 1220 x 1220mm all in accordance to Type D3, annexured to these Bills of Quantities for the full details, drawing number: TGC/04.	No	2	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
28	550mm Diameter x 176kg, type 2A cast iron cover and frame including	No	1	
29	450 x 300mm St. Gobain type 2880 heavy duty cast iron grate and frame including casting in fixing lugs into concrete	No	1	
	Sundries			
30	Extra over excavation in earth for pipe trenches, chambers, etc for excavation in soft rock **(LI)**	m3	61	
31	Extra over excavation in earth for pipe trenches, chambers, etc for excavation in hard rock	m3	31	
32	Extra over excavation for pipe trenches, chambers, etc for carting away surplus material to a dumping site to be located by the Contractor	m3	246	
33	Extra over backfilling to pipe trenches, chambers, etc for imported selected and approved granular material for bedding material SANS 1200 LB 3.3, maximum aggregate 6mm compacted to 93% MOD AASHTO density in 100mm layers **(LI)**	m3	82	
34	Extra over backfilling to pipe trenches, chambers, etc for imported selected and approved granular material for fill blanket material placed in accordance to SANS 1200 LB 3.2, maximum aggregate 10mm compacted to 93% MOD AASHTO density **(LI)**	m3	82	
35	Extra over backfilling to pipe trenches, chambers, etc for imported selected and approved granular material for backfill material placed and compacted in accordance to SANS 1200 BD 3.5, maximum aggregate 63mm compacted in to 93% MOD AASHTO density **(LI)**	m3	82	
	Testing			
36	Allow for testing of the entire stormwater drainage system to Engineer's satisfaction.		Item	
	SOIL DRAINAGE			
	(CPAP WORK GROUP NO. 146 UNLESS OTHERWISE STATED)			
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Class 34 heavy duty uPVC pipes laid in class B bedding including all excavation, bedding, backfilling and compaction and disposal of surplus material			
37	110mm Pipes vertically or ramped to cleaning eyes etc. (no excavation) **(LI)**	m	57	
38	110mm Pipes laid in and trenches not exceeding 1m deep **(LI)**	m	315	
39	110mm Pipes laid in and including trenches exceeding 1m and not exceeding 2m deep **(LI)**	m	176	
	Extra over class 34 uPVC pipes for fittings			
40	110mm Bends **(LI)**	No	111	
41	110mm Access junction **(LI)**	No	54	
	Precast concrete circular inspection chambers (covers elsewhere)			
	Where approach grades into the manhole are 1:15 or steeper and associated with a change in direction in the manhole of 30° or more, the benching is to be brought up two pipe diameters above the pipe invert (Type B benching sewers)			
	Rendering for all manhole benching shall consist of one part H.A.C. to two parts sand thoroughly mixed and applied to 'uncured' concrete surfaces to a minimum thickness of 20mm			
42	Excavate for and construct 1000mm internal diameter circular pre-cast concrete manhole exceeding 750mm but not exceeding 1000mm deep with 1130mm diameter x 250mm thick unreinforced concrete grade 25/26 base and benching and 150mm thick pre-cast cover slab as described above, including all risk of collapse, compaction and backfilling, etc. on completion **(LI)**	No	12	
43	Excavate for and construct 1000mm internal diameter circular pre-cast concrete manhole exceeding 1000mm but not exceeding 1250mm deep with 1130mm diameter x 250mm thick unreinforced concrete grade 25/26 base and benching and 150mm thick pre-cast cover slab as described above, including all risk of collapse, compaction and backfilling, etc. on completion **(LI)**	No	2	
	Carried Forward			R

Bill No. 18
External Works

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				R
	Brought Forward			
44	Excavate for and construct 1000mm internal diameter circular pre-cast concrete manhole exceeding 1250mm but not exceeding 1500mm deep with 1130mm diameter x 250mm thick unreinforced concrete grade 25/26 base and benching and 150mm thick pre-cast cover slab as described above, including all risk of collapse, compaction and backfilling, etc. on completion **(LI)**	No	3	
	Covers, etc			
45	550mm Diameter x 176kg, type 2A cast iron cover and frame including	No	17	
	Sundries			
46	Excavate for and construct gulley comprising of 110mm uPVC gulley trap with 190mm diameter uPVC hopperhead with pvc grating, all set in mass concrete and not exceeding 500mm deep. The top of the gulley to be raised 75mm above surrounding ground level and internally dished down to hopper head with smoothened render and external of raised sides to be finished neatly. **(LI)**	No	24	
47	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in soft rock **(LI)**	m3	110	
48	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in hard rock	m3	55	
49	Extra over excavation for pipe trenches, chambers, etc for carting away surplus material to a dumping site to be located by the Contractor	m3	330	
50	Extra over backfilling to pipe trenches, chambers, etc for imported selected and approved granular material for bedding material SANS 1200 LB 3.3, maximum aggregate 6mm compacted to 93% MOD AASHTO density in 100mm layers **(LI)**	m3	110	
51	Extra over backfilling to pipe trenches, chambers, etc for imported selected and approved granular material for fill blanket material placed in accordance to SANS 1200 LB 3.2, maximum aggregate 10mm compacted in to 93% MOD AASHTO density **(LI)**	m3	110	
	Carried Forward			R

Bill No. 18
External Works

	Brought Forward			R
52	Extra over backfilling to pipe trenches, chambers, etc for imported selected and approved granular material for backfill material placed and compacted in accordance to SANS 1200 BD 3.5, maximum aggregate 63mm compacted in to 93% MOD AASHTO density **(LI)**	m3	110	
53	110mm 'ABC" cast iron rodding eyes set in 300 x 300 x 300mm thick 15MPa/19 unreinforced concrete surround finished smooth on exposed surfaces with rounded angles	No	8	
	Connection to Municipal mains:			
54	Allow for connection of sewer drainage system to Municipality Sewer Mains including cutting into side of existing inspection chamber for and connecting 160mm pipe, including inserting 160mm channel junction and making good concrete benching and manholes etc		Item	
55	Cutting into side of existing inspection chamber for and connecting 110mm pipe, including inserting channel junction and making good concrete benching	No	1	
	Testing			
56	Allow for testing of the entire sewer drainage system to the satisfaction of the Engineer		Item	
	WATER SUPPLIES			
	(CPAP WORK GROUP NO. 148 UNLESS OTHERWISE STATED)			
	CLASS 12 PN10 Pipe laid on Class "B" bedding, including excavations in pickable material, backfilling and compacting to 95% Modified AASHTHO density and all necessary risk of collapse and dewatering of trenches			
57	20mm Pipes laid in and including trenches exceeding 1m but not exceeding 2m deep **(LI)**	m	49	
58	25mm Pipes laid in and including trenches exceeding 1m but not exceeding 2m deep **(LI)**	m	95	
	Carried Forward			R

Bill No. 18
External Works

R.

				R
	Brought Forward			
59	32mm Pipes laid in and including trenches exceeding 1m but not exceeding 2m deep **(LI)**	m	72	
60	40mm Pipes laid in and including trenches exceeding 1m but not exceeding 2m deep **(LI)**	m	39	
61	50mm Pipes laid in and including trenches exceeding 1m but not exceeding 2m deep **(LI)**	m	18	
62	110mm Pipes laid in and including trenches exceeding 1m but not exceeding 2m deep **(LI)**	m	586	
	Extra over HDPE pipe for 'Plasson' or other equally approved HDPE compression type fittings			
63	25mm Elbow **(LI)**	No	18	
64	25 x 20mm Elbow **(LI)**	No	8	
65	25mm Tees **(LI)**	No	2	
66	25 x 20mm Tees **(LI)**	No	26	
67	32mm Elbows **(LI)**	No	10	
68	32 x 25mm Elbow **(LI)**	No	2	
69	32mm Tees **(LI)**	No	5	
70	32 x 20mm Tees **(LI)**	No	15	
71	32 x 25mm Tees **(LI)**	No	2	
72	32 x 25mm Reducer **(LI)**	No	6	
73	40mm Elbows **(LI)**	No	1	
74	40 x 25mm Tees **(LI)**	No	1	
75	40 x 32mm Tees **(LI)**	No	2	
76	40 x 32mm Reducer **(LI)**	No	1	
77	50 x 32mm Tees **(LI)**	No	1	
78	50 x 40mm Reducer **(LI)**	No	1	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
79	110mm Elbow **(LI)**	No	21	
80	110mm Tees **(LI)**	No	2	
81	110 x 32mm Tees **(LI)**	No	6	
82	110 x 50mm Tees **(LI)**	No	1	
	Brassware			
83	110mm Gate valve	No	8	
84	50mm brass non return valve	No	4	
85	50mm brass in line strainer	No	5	
86	20mm Coupling **(LI)**	No	57	
87	25mm Coupling **(LI)**	No	8	
88	32mm Coupling **(LI)**	No	8	
	Valve Chambers, etc.			
89	Valve box set 440 x 370mm internally and not exceeding 900mm deep internally on 610 x 540 x 100mm thick concrete base, including 110mm brickwork of NFX extra hard burnt brickwork and fitted with and including with 610 x 540mm cast iron cover and frame set level to the ground all in accordance to details 2, annexured to these Bills of Quantities for the full details, drawing number: TGC/10.	No	8	
	Sundries			
90	20Mpa/19mm Unreinforced mass concrete as anchor blocks around various fittings **(LI)**	m3	2	
91	20Mpa/19mm Unreinforced mass concrete encasing to pipework on trenches **(LI)**	m3	4	
92	200 x 200 x 200mm Mass concrete markers blocks	No	30	
93	Extra over excavation in earth for pipe trenches, valve boxes, etc for excavation in soft rock **(LI)**	m3	172	
94	Extra over excavation in earth for pipe trenches, valve boxes, etc for excavation in hard rock	m3	86	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
95	Cart away surplus material to a dumping site located by the contractor	m3	387	
96	Import Class "B" bedding and initial backfill to 300mm above crown of pipe **(LI)**	m3	387	
	Municipal connection			
97	Allow for the tie in to the municipal water main		Item	
	Testing			
98	Allow for testing the whole of the Domestic water supplies to the satisfaction of the Principal Agent and Local authority. All defective work to removed and made good at the contractors expense and the whole works to be re-tested until found satisfactory		Item	
	FIRE WATER MAIN			
	(CPAP WORK GROUP NO. 148 UNLESS OTHERWISE STATED)			
	"HDPE" or other equally approved pipes with solvent welded joints			
99	32mm "HDPE 100PN 12.5" pipes laid in and including trenches not exceeding 1m deep **(LI)**	m	19	
100	80mm "HDPE 100PN 12.5" pipes laid in and including trenches not exceeding 1m deep **(LI)**	m	24	
101	110mm "HDPE 100PN 12.5" pipes laid in and including trenches not exceeding 1m deep **(LI)**	m	538	
	Extra over HDPE Pipes for Electroweld Fusion couplings for Fittings			
102	32mm Elbow **(LI)**	No	1	
103	80mm Elbow **(LI)**	No	16	
104	110mm Elbow **(LI)**	No	19	
105	110mm Tees **(LI)**	No	14	
106	110 x 32mm Tees **(LI)**	No	1	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
107	110 x 80mm Tees **(LI)**	No	8	
108	32mm Coupling **(LI)**	No	1	
109	110mm Coupling **(LI)**	No	12	
	Isolating valve chamber			
110	Excavate in ground for and build valve chamber 630 x 630 x 1000mm deep of precast concrete chamber rings with dry joints with 100mm (10MPa) thick concrete base, 150mm thick (20Mpa) concrete slab fitted with and including 102mm diameter cast iron hinged cover and frame.	No	4	
	Extra over isolating valve chamber			
111	110mm Gate Valve	No	4	
	Sundries			
112	25MPa/19mm unreinforced mass concrete as anchor blocks around various fittings **(LI)**	m3	19	
113	Extra over excavation in earth for pipe trenches, valve boxes, etc for excavation in soft rock **(LI)**	m3	46	
114	Extra over excavation in earth for pipe trenches, valve boxes, etc for excavation in hard rock	m3	23	
115	Cart away surplus material to a dumping site located by the contractor	m3	172	
116	Import Class "B" bedding and initial backfill to 300mm above crown of pipe **(LI)**	m3	153	
117	75mm Hydrant with connection with cap and chain	No	7	
118	80 x 65mm Brass double booster pump connection with caps and chains	No	1	
	Municipal connection			
119	Allow for the tie in to the municipal water main		Item	
	Carried Forward			R

	Brought Forward			R
	Testing			
120	Allow for testing the whole of the Fire water supplies to the satisfaction of the Principal Agent and Local authority. All defective work to removed and made good at the contractors expense and the whole works to be re-tested until found satisfactory		Item	
	CONCRETE APRONS			
	Earthworks (CPAP Work Group No. 104)			
	Excavation other than bulk			
121	Excavate to reduced level **(LI)**	m3	162	
122	Edge thickening **(LI)**	m3	50	
	Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)			
123	Off site to a dumping site to be found by the Contractor.	m3	212	
	Keeping excavations free of water			
124	Keeping excavations free of all water other than subterranean water		Item	
	Compaction of surfaces			
125	Compaction of ground surface under pavings, roads etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	541	
	Base course of earth filling supplied by the contractor under pavings, roads, etc			
126	Construct 150mm thick base layer of G5 materials obtained from commercial sources, compacted to a density of at least 95% Mod. AASHTO density. **(LI)**	m3	81	
	Prescribed density tests on filling			
127	Modified AASHTO Density tests	No	14	
	Carried Forward			R

Bill No. 18
External Works

	Brought Forward			R
	Weedkiller mixed with water and applied at a rate of 100grams/m2			
128	Under apron, etc. **(LI)**	m2	541	
	Concrete (CPAP Work Group No. 110)			
	Reinforced concrete cast against excavated surfaces			
	30MPa/19mm concrete			
129	Concrete aprons **(LI)**	m3	81	
130	Edge thickening **(LI)**	m3	50	
	Test cubes			
131	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	22	
	Concrete sundries			
	Finishing top surfaces of concrete smooth with a wood float			
132	Surface beds, slabs, etc.to falls **(LI)**	m2	541	
	Formwork (CPAP Work Group No. 111)			
	Rough formwork to sides			
133	Edges, risers, ends and reveals not exceeding 300mm high or wide **(LI)**	m	959	
	Movement joints etc			
	Expansion joints with 15mm softboard between vertical concrete surfaces, including necessary formwork			
134	Not exceeding 300mm high between surface beds and brickworks **(LI)**	m	800	
	Reinforcement (CPAP Work Group No. 114)			
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Fabric reinforcement			
135	Type Ref. 193 fabric reinforcement in concrete surface beds, slabs, etc. **(LI)**	m2	541	
	Masonry (CPAP Work Group No. 116)			
	30MPa "Corobrik" or other equally approved Cederberg Modular paving bricks			
136	65mm clay paving bricks laid in herringbone pattern to SANS 1200MJ, blocks laid on 25mm river sand layer on concrete aprons (concrete aprons elsewhere measured) **(LI)**	m2	541	
	Waterproofing (CPAP Work Group No. 120)			
	One layer of 375 micron waterproof sheeting sealed at laps as per approval			
137	Under surface beds **(LI)**	m2	541	
	Joint sealants etc			
	Two-part grey or other equally approved polysulphide sealing compound including backing cord, bond breaker , primer, etc			
138	15 x 10mm In horizontal expansion joints including raking out expansion joint filler as necessary	m	800	
	CONCRETE PLATFORM			
	Earthworks (CPAP Work Group No. 104)			
	Excavation other than bulk			
139	Excavate to reduced level **(LI)**	m3	24	
140	Edge thickening **(LI)**	m3	3	
	Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)			
141	Off site to a dumping site to be found by the Contractor.	m3	27	
	Carried Forward			R

				R
	Brought Forward			
	Keeping excavations free of water			
142	Keeping excavations free of all water other than subterranean water		Item	
	Compaction of surfaces			
143	Compaction of ground surface under pavings, roads etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	48	
	Base course of earth filling supplied by the contractor under pavings, roads, etc			
144	Construct 150mm thick base layer of G5 materials obtained from commercial sources, compacted to a density of at least 95% Mod. AASHTO density. **(LI)**	m3	14	
	Prescribed density tests on filling			
145	Modified AASHTO Density tests	No	2	
	Weedkiller mixed with water and applied at a rate of 100grams/m2			
146	Under concrete platform, etc. **(LI)**	m2	48	
	Concrete (CPAP Work Group No. 110)			
	Reinforced concrete cast against excavated surfaces			
	30MPa/19mm concrete			
147	Concrete aprons **(LI)**	m3	10	
148	Edge thickening **(LI)**	m3	3	
	Test cubes			
149	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	2	
	Concrete sundries			
	Carried Forward			R

Bill No. 18
External Works

	Brought Forward			R
	Finishing top surfaces of concrete smooth with a wood float			
150	Surface beds, slabs, etc.to falls **(LI)**	m2	48	
	Formwork (CPAP Work Group No. 111)			
	Rough formwork to sides			
151	Edges, risers, ends and reveals not exceeding 300mm high or wide **(LI)**	m	28	
	Movement joints etc			
	Expansion joints with 15mm softboard between vertical concrete surfaces, including necessary formwork			
152	Not exceeding 300mm high between surface beds and brickworks **(LI)**	m	8	
	Reinforcement (CPAP Work Group No. 114)			
	Fabric reinforcement			
153	Type Ref. 395 fabric reinforcement in concrete surface beds, etc. **(LI)**	m2	48	
	Waterproofing (CPAP Work Group No. 120)			
	One layer of 375 micron waterproof sheeting sealed at laps as per approval			
154	Under surface beds **(LI)**	m2	48	
	Joint sealants etc			
	Two-part grey or other equally approved polysulphide sealing compound including backing cord, bond breaker , primer, etc			
155	15 x 10mm In horizontal expansion joints including raking out expansion joint filler as necessary	m	8	
	WALKWAY			
	Earthworks (CPAP Work Group No. 104)			
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Excavation other than bulk			
156	Excavate to reduced level **(LI)**	m3	34	
	Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)			
157	Off site to a dumping site to be found by the Contractor.	m3	34	
	Keeping excavations free of water			
158	Keeping excavations free of all water other than subterranean water		Item	
	Compaction of surfaces			
159	Compaction of ground surface under pavings, roads etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	343	
	Base course of earth filling supplied by the contractor under pavings, roads, etc			
160	Construct 100mm thick base layer of G2 materials obtained from commercial sources, compacted to a density of at least 98% Mod AASHTO density. **(LI)**	m3	34	
	Testing of material and filling			
	Descriptions of earth filling, compaction, etc shall be deemed to include for all necessary testing required in accordance with the SABS 1200 series			
	The items of testing given below are for additional testing which may be required by the Engineer over and above those required in accordance with the SABS 1200 series			
	Additional tests required by Engineer			
161	Maximum dry density and optimum moisture content test in accordance with Method A7 of TMH 1	No	4	
162	Atterberg limits test in accordance with methods A2 to A4 of TMH 1	No	2	
	Carried Forward			R

Bill No. 18
External Works

R. n1

	Brought Forward		
163	In-situ dry density test in accordance with method A10(b) of TMH 1		Item
	Weedkiller mixed with water and applied at a rate of 100grams/m2		
164	Under parking area, etc. **(LI)**	m2	343
	Roadwork (CPAP Work Group No. 154)		
	Bituminous premix road surfacing		
165	Prime and lay 20mm thick. Bitumen 9.5mm Stone, laid compacted, to falls	m2	343
	Precast concrete finished smooth on exposed surfaces including bedding, jointing and pointing		
166	Kerb (SABS 927 fig 6) 125 x 260mm high with 150 x 150 x 300mm unreinforced concrete haunching at back of each joint including excavation, backfilling, etc. **(LI)**	m	458
	RETAINING WALLS, PLANTER WALLS, RAMP AND STAIRCASES		
	Earthworks (CPAP Work Group No. 104)		
	Excavation other than bulk		
167	Trenches **(LI)**	m3	370
168	Excavate to reduced level **(LI)**	m3	117
169	Edge thickening **(LI)**	m3	6
	Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)		
170	Off site to a dumping site to be found by the Contractor.	m3	257
	Risk of collapse of excavations		
171	Sides of trench and hole excavations not exceeding 1,5m deep	m2	925
	Carried Forward		

	Brought Forward			R
	Keeping excavations free of water			
172	Keeping excavations free of all water other than subterranean water		Item	
	Compaction of surfaces			
173	Compaction of ground surface under strip footings, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	370	
174	Compaction of ground surface under ramps, staircase, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	84	
	Earth filling obtained from the excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density.			
175	Backfilling to trenches, holes, etc. **(LI)**	m3	236	
	Base course of earth filling supplied by the contractor under pavings, roads, etc			
176	Construct 150mm thick base layer of G5 materials obtained from commercial sources, compacted to a density of at least 95% Mod. AASHTO density.	m3	59	
	Prescribed density tests on filling			
177	Modified AASHTO Density tests	No	49	
	Weedkiller mixed with water and applied at a rate of 100grams/m2			
178	Under floors, etc. **(LI)**	m2	84	
179	To sides and bottoms of trench excavations **(LI)**	m2	1 295	
	Concrete (CPAP Work Group No. 110)			
	Reinforced concrete cast against excavated surfaces /or formworks			
	Carried Forward			R

Bill No. 18
External Works

	Brought Forward			R
	30MPa/19mm concrete			
180	Strip footings **(LI)**	m3	93	
181	Edge thickening **(LI)**	m3	6	
182	Surface ramps **(LI)**	m3	54	
183	Staircase **(LI)**	m3	7	
	Test cubes			
184	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	27	
	Concrete sundries			
	Finishing top surfaces of concrete smooth with a wood float			
185	Surface beds, slabs, etc. to falls **(LI)**	m2	84	
	Formwork (CPAP Work Group No. 111)			
	Rough formwork to sides			
186	Edges, risers, ends and reveals not exceeding 300mm high or wide **(LI)**	m	86	
187	Edges, risers, ends and reveals not exceeding 300mm high or wide set raking **(LI)**	m	86	
188	Sloping and stepped outer edges of stairs not exceeding 500mm high extreme **(LI)**	m	28	
	Movement joints etc			
	Expansion joints with 15mm softboard between vertical concrete surfaces, including necessary formwork			
189	Not exceeding 300mm high between surface beds and brickworks **(LI)**	m	86	
	Reinforcement (CPAP Work Group No. 114)			
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Mild and high tensile steel reinforcement to structural concrete work			
190	Various diameter bars **(LI)**	t	10,52	
	Fabric reinforcement			
191	Type Ref. 245 fabric reinforcement in concrete surface beds, slabs, etc. **(LI)**	m2	84	
	Masonry (CPAP Work Group No. 116)			
	Brickwork of NFX bricks in class II mortar			
192	One brick walls in foundations **(LI)**	m2	145	
193	One and half brick walls in foundations **(LI)**	m2	203	
194	One brick walls **(LI)**	m2	146	
195	One and half brick walls **(LI)**	m2	213	
	Brickwork sundries			
	2.5mm Galvanised brickwork reinforcement			
196	155mm Wide reinforcement built in horizontally **(LI)**	m	4 391	
	Face brickwork			
	"Agate" travertine FBX or other equally approved face bricks pointed with tinted recessed horizontal and vertical joints			
197	Extra over brickwork for face brickwork walls in foundations **(LI)**	m2	118	
198	Extra over brickwork for face brickwork walls **(LI)**	m2	359	
199	Extra over brickwork for brick-on-edge header course bands one course high **(LI)**	m	463	
	Waterproofing (CPAP Work Group No. 120)			
	One layer of 375 micron waterproof sheeting sealed at laps as per approval			
200	Under surface beds **(LI)**	m2	84	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	"RFK Chemflex" or other equally approved waterproofing slurry, with and including "Sika membrane applied as per manufacturer's instructions			
201	On walls	m2	705	
	Joint sealants etc			
	Two-part grey or other equally approved polysulphide sealing compound including backing cord, bond breaker , primer, etc			
202	15 x 10mm In horizontal expansion joints including raking out expansion joint filler as necessary	m	86	
	Drainage (CPAP Work Ground No. 146 Unless Otherwise Stated)			
	Slotted HDPE flexible drainage pipes			
203	110mm HDPE flexible slotted agricultural pipes laid behind retaining walls for a depth not exceeding 3m including 19mm crushed stone encasing 300 x 300mm, "Kaymat' U34 geofabric filter blanket wrapped around encasing with 150mm side and 300mm end laps including stitching and 300 x 300mm river sand. **(LI)**	m	325	
204	Extra over for 110mm cap **(LI)**	No	12	
205	Extra over for 110mm bend **(LI)**	No	36	
	BOUNDARY WALLS, FENCE AND GATES			
	Earthworks (CPAP Work Group No. 104)			
	Excavation other than bulk			
206	Trenches **(LI)**	m3	550	
	Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)			
207	Off site to a dumping site to be found by the Contractor.	m3	365	
	Carried Forward			R

				R
	Brought Forward			
	Risk of collapse of excavations			
208	Sides of trench and hole excavations not exceeding 1,5m deep	m2	1 572	
	Keeping excavations free of water			
209	Keeping excavations free of all water other than subterranean water		Item	
	Compaction of surfaces			
210	Compaction of ground surface under strip footings, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	367	
	Earth filling obtained from the excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density.			
211	Backfilling to trenches, holes, etc. **(LI)**	m3	185	
	Base course of earth filling supplied by the contractor under pavings, roads, etc			
212	Construct 150mm thick base layer, under strip footings, of G5 materials obtained from commercial sources, compacted to a density of at least 95% Mod. AASHTO density. **(LI)**	m3	110	
	Prescribed density tests on filling			
213	Modified AASHTO Density tests	No	49	
	Weedkiller mixed with water and applied at a rate of 100grams/m2			
214	To sides and bottoms of trench excavations **(LI)**	m2	1 939	
	Concrete (CPAP Work Group No. 110)			
	Reinforced concrete cast against excavated surfaces /or formworks			
	30MPa/19mm concrete			
215	Strip footings **(LI)**	m3	110	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Test cubes			
216	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	18	
	Formwork (CPAP Work Group No. 111)			
	Rough formwork to sides			
217	Stepped face of foundations (LI)	m2	24	
	Reinforcement (CPAP Work Group No. 114)			
	Mild and high tensile steel reinforcement to structural concrete work			
218	Various diameter bars (LI)	t	11,55	
	Masonry (CPAP Work Group No. 116)			
	Brickwork of NFX bricks in class II mortar			
219	One brick walls in foundations (LI)	m2	472	
220	Piers in foundations (LI)	m3	36	
221	One brick walls (LI)	m2	1 143	
222	Piers (LI)	m3	99	
	Brickwork sundries			
	2.5mm Galvanised brickwork reinforcement			
223	155mm Wide reinforcement built in horizontally (LI)	m	8 632	
	Brickwork sundries			
	Bagging of 1:3 cement and sand mixture			
224	On brick walls, piers, etc. (LI)	m2	2 202	
	Joint forming material in movement joints			
225	12mm Bitumen impregnated fibre board built in vertically through brick walls not exceeding 300mm wide (LI)	m	74	
	Carried Forward			R

				R
	Brought Forward			
226	12mm Bitumen impregnated fibre board built in vertically through brick walls exceeding 300mm wide **(LI)**	m2	307	
	Face brickwork			
	"Agate" travertine FBX or other equally approved face bricks pointed with tinted recessed horizontal and vertical joints			
227	Extra over brickwork for face brickwork on both sides in foundations **(LI)**	m2	136	
228	Extra over brickwork for face brickwork to piers in foundations **(LI)**	m2	79	
229	Extra over brickwork for face brickwork on both sides of wall **(LI)**	m2	1 143	
230	Extra over brickwork for face brickwork to piers **(LI)**	m2	751	
231	Extra over brickwork for brick-on-edge header course bands one course high **(LI)**	m	706	
	Waterproofing (CPAP Work Group No. 120)			
	Two coats emulsion bitumen emulsion waterproof coating as per approval			
232	On bagged brick walls, piers, etc. **(LI)**	m2	2 202	
	Joint sealants etc			
	Polyurethaneor other equally approved sealing compound including backing cord, bond breaker, primer, etc.			
233	12 x 12mm In vertical expansion joints including raking out expansion joint filler as necessary	m	1 078	
	Metalwork (CPAP Work Group No. 136)			
	Welded Mesh Fencing or other equal approved invisible wall panels			
234	2.42m High double skim clamber proof fence in panels 3.39m width with aperture size 12 x 12mm with 5x staining wires. Installed all in accordance with manufacturer's details	m	204	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Fence Posts			
235	3,6m High intermediate fence post mild steel galvanised, size 85mm tapering to 45mm. Post to be built into 600mm into concrete base. Concrete base size 600 x 600 x 700mm deep with and including excavations, cart away, backfilling, etc.	No	61	
	Minimum 600mm high galvanised high tensile steel flat wrap razor wire fixed on 3x straining wires, staining wires fixed on metal brackets. Bracket fixed on brick wall. Installed all in accordance to manufacturer's details			
236	600mm High flat wrap razor wire on top of brick walls	m	442	
	Minimum 600mm high galvanised high tensile steel flat wrap razor wire fixed on 3x straining wires, staining wires fixed steel posts (steel posts elsewhere measured), Installed all in accordance to manufacturer's details			
237	600mm High flat wrap razor wire on top of steel fence	m	204	
	100mm Electro-galvanized, 2mm thick, toughened steel security spikes fixed on top of walls, fence, etc., installed all in accordance to manufacturer's details			
238	100mm Electro-galvanized security spikes fixed on top of brick walls	m	442	
239	100mm Electro-galvanized security spikes fixed on top steel fence	m	204	
	Gates, screens, etc.			
	Gates, etc.			
240	Motorised sliding gate size 4200 x 1800mm high formed of 50 x 50 x 2mm hollow section frame and mullions and filled in with horizontal bars, with and including approved sliding track cast into 30Mpa/19mm concrete. Type G05. Tenderer's are referred to Architect's drawings annexed to these Bills of Quantities, Architect's drawing No. 132002 UKU - A - 1003 - SP10.	No	2	
	Carried Forward			R

	Brought Forward			R
241	1430 x 2250mm High Titan full height free rotation turnstile by "Turnstar" or other equally approved and comprises of rotalok rotation locking mechanism and electronic control panel incorporates of anti-trap safety system, suspended Rotor technology, mechanical key override, shock absorbing rubber coupling, lockable top cover, 50mm diameter tube arms spaced 120mm apart, access control reader mounting position, rotarun perpetual base bearing, wiring side entry point, wiring bottom entry point, floor bolting positions, wall bolting positions, etc. and installed all in accordance to manufacturer's specifications. Type G04. Tenderer's are referred to Architect's drawings annexed to these Bills of Quantities, Architect's drawing No. 132002 UKU - A - 1003 - SP10.	No	1	
	Drainage (CPAP Work Ground No. 146 Unless Otherwise Stated)			
	Class 34 heavy duty uPVC pipes			
242	280mm Long weep pipe built into one brick walls with one end left 50mm projection in front of walls	No	1 397	
	DRIVEWAY AND PARKING AREA			
	(CPAP WORK GROUP NO. 154 UNLESS OTHERWISE STATED)			
	Excavation other than bulk			
243	Excavate to reduced level	m3	2 675	
	Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)			
244	Off site to a dumping site to be found by the Contractor.	m3	2 675	
	Keeping excavations free of water			
245	Keeping excavations free of all water other than subterranean water		Item	
	Carried Forward			R

	Brought Forward			R
	Compaction of surfaces			
246	Compaction of ground surface under pavings, roads etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	4 718	
	Base course of earth filling supplied by the contractor under pavings, roads, etc			
247	Construct 150mm thick base layer of G7 materials obtained from commercial sources, compacted to a density of at least 95% Mod. AASHTO density.	m3	1 344	
248	Construct 150mm thick base layer of G5 materials obtained from commercial sources, compacted to a density of at least 95% Mod. AASHTO density.	m3	708	
249	Construct 125mm thick base layer of G2 materials obtained from commercial sources, compacted to a density of at least 98% Mod AASHTO density.	m3	623	
	Testing of material and filling			
	Descriptions of earth filling, compaction, etc shall be deemed to include for all necessary testing required in accordance with the SABS 1200 series			
	The items of testing given below are for additional testing which may be required by the Engineer over and above those required in accordance with the SABS 1200 series			
	Additional tests required by Engineer			
250	Maximum dry density and optimum moisture content test in accordance with Method A7 of TMH 1	No	160	
251	Atterberg limits test in accordance with methods A2 to A4 of TMH 1	No	107	
252	In-situ dry density test in accordance with method A10(b) of TMH 1		Item	
	Weedkiller mixed with water and applied at a rate of 100grams/m2			
253	Under parking area, etc. **(LI)**	m2	4 718	
	Carried Forward			R

Bill No. 18
External Works

R n1 277

				R
	Brought Forward			
	Bituminous premix road surfacing			
254	Prime and lay 30mm thick. Bitumen 9.5mm Stone, laid compacted, to falls	m2	4 718	
	Precast concrete finished smooth on exposed surfaces including bedding, jointing and pointing			
255	Kerb (SABS 927 fig 6) 125 x 260mm high with 150 x 150 x 300mm unreinforced concrete haunching at back of each joint including excavation, backfilling, etc	m	635	
256	Kerb (SABS 927 fig 6) 125 x 260mm high with 150 x 150 x 300mm unreinforced concrete haunching at back of each joint circular on plan not exceeding 4m radius formed with short lengths of straight kerb including excavation, backfilling, etc	m	47	
	Paintwork			
	Prepare and apply one coat non reflective road marking paint at a nominal rate of 0.42l/m² on bituminous road surfacing, pre-cast concrete paving blocks, etc.			
257	100mm Wide solid lines to parking demarcation bays, etc.	m	1 088	
258	1,0m Long directional arrows	No	20	
259	1,3m Long letters to 'STOP' sign, etc.	No	3	
260	11 x 3,4m Wide pedestrian walkway	No	1	
261	Disabled parking bay sign approximately 1,2m high	No	6	
262	Painted white parking numbers	No	145	
	DOMESTIC AND FIRE WATER STORAGE TANKS AND PUMPS			
	Metalwork (CPAP Work Group No. 136)			
	Carried Forward			R

Bill No. 18
External Works

	Brought Forward			R
	Hot Dipped Galvanised Sundry Steelwork			
263	Supply, delivery, installation, connection, testing & commissioning of sectional steel 60kL effective capacity dedicated water storage tank for adequate supply of domestic water system including flanges, connections, fittings, hangers, brackets, vortex inhibitor, water level indicator, water inlets, water outlets to domestic pumps, catladder, access hatches, valves, drains, etc. complete. Reference to be made to Wet Services Drawing D3925-DW-A0-02 and technical specification when pricing, annexed to these bills of quantities.	No	1	
264	Supply, delivery, installation, connection, testing & commissioning of Cylindrical 144KL effective capacity dedicated fire storage tank for adequate supply of fire system including flanges, connections, fittings, hangers, brackets, vortex inhibitor, water level indicator, water inlets, water outlets to fire pumps, catladder, access hatches, valves, drains, etc complete. Reference to be made to DWG D0000-MF-A1-04 and technical specification when pricing, annexed to these bills of quantities.	No	1	
	Mechanical (CPAP Work Group No. 170)			
	Supply and deliver the following booster pumps (KSB or other equally approved), complete with all with electrical connection to isolator, intenal pump house reticulation piping- and drain piping, electrical control wiring, brackets, supports, steel bases, control panel and all necessary accessories, as per the specification and manufacturer's recommendation.			
265	Supply, delivery, installation, connection, testing & commissioning of complete domestic water Bi-Plex Electric pump set including valves, vacuum breaks, auto air vents, etc. Pumps to operate Duty and Standby. Each Pump sized for 270 L/m @2.18bar	No	1	
266	Supply, delivery, installation, connection, testing & commissioning of complete fire water (Electric) pump set including valves, vacuum breaks, auto air vents, etc. Electric pump sized for 2400 L/m @17.53bar, Electrical Jockey pump sized for 60 L/min @17.53bar)	No	1	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
267	Supply, delivery, installation, connection, testing & commissioning of pump control panels		Item	
268	Supply, delivery, installation, connection, testing & commissioning of all electrical work in the pump house		Item	
269	Allow for the production and fixing of all statutory signs on chromadek or other equally approved material		Item	
270	Allow for all auxiliary equipment as specified in this document as well as the SANS 10287 code of practice, incl. valves, fittings supports, fire detection, ventilation, sprinkler protection to pump house, etc.		Item	
271	Supply, delivery, installation, connection, testing & commissioning of trunk mains from pump house to building		Item	
272	Supply, delivery, installation, connection, testing & commissioning of trunk mains from pump house to installation of control valves		Item	
	Pipework, valves, fittings, etc.			
273	150mm Butterfly valves	No	6	
274	2500kPa Pressure gauge	No	16	
275	Domestic water pump test meter	No	1	
276	Fire water pump test meter	No	1	
277	100mm Butterfly valve	No	4	
278	150mm Non-return valve	No	4	
279	150mm Expansion joints	No	8	
280	150mm Strainer	No	2	
281	150mm Gate valve	No	6	
282	250mm Gate valve	No	4	
283	Vortex impellers	No	4	
284	Pressure switch	No	10	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
285	20mm Ball valve	No	10	
286	20mm Check valve	No	8	
287	50mm Rubber expansion joints	No	4	
288	50mm Check valve	No	2	
289	50mm Ball valve	No	2	
290	Membrane vessel	No	2	
291	250mm Brass elbows	No	3	
292	150mm Brass elbows	No	4	
293	100mm Brass elbows	No	5	
294	250mm Brass tee-pieces	No	1	
295	150mm Brass tee-pieces	No	2	
296	250mm Brass straight piping	No	18	
297	150mm Brass straight piping	No	30	
298	100mm Brass straight piping	No	8	
299	250mm Black mild steel elbows	No	3	
300	150mm Black mild steel elbows	No	4	
301	100mm Black mild steel elbows	No	5	
302	250mm Black mild steel tee-pieces	No	1	
303	150mm Black mild steel tee-pieces	No	2	
304	250mm Black mild steel straight piping	No	18	
305	150mm Black mild steel straight piping	No	30	
306	100mm Black mild steel straight piping	No	8	
	WATER TANK BASE AND PLINTH			
	Carried Forward			R

Bill No. 18
External Works

R. RJ

				R
	Brought Forward			
	Earthworks (CPAP Work Group No. 104)			
	Excavation in earth not exceeding 2m deep			
307	Reduced levels under floors **(LI)**	m3	22	
	Extra over all excavations for carting away			
308	Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor	m3	22	
	Risk of collapse of excavations			
309	Sides of trench and hole excavations exceeding 1,5m and not exceeding 3m deep	m2	16	
	Compaction of surfaces			
310	Compaction of ground surface under floors, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% mod AASHTO density	m2	54	
	Earth filling of G5 material supplied by contractor from commercial sources in accordance with SABS 1200 DM compacted to 98% Mod AASHTO density in 150mm thick layers			
311	Under floors, steps, pavings, etc. **(LI)**	m3	8	
	Prescribed density tests on filling			
312	Modified AASHTO Density tests	No	4	
	Approved brand of anti-termite soil poison applied by a Registered Pest Control company and guaranteed against termite infestation for ten years			
313	Under floors, sides, etc. including forming and poisoning shallow furrows against foundation walls etc., filling in furrows and ramming **(LI)**	m2	64	
	Concrete (CPAP Work Group No. 110)			
	Reinforced concrete cast against excavated surfaces			
	Carried Forward			R

				R
	Brought Forward			
	30MPa/19mm concrete			
314	Surface base **(LI)**	m3	14	
	Reinforced concrete cast against on/in formwork			
	30MPa/19mm concrete			
315	Upstand beams (Plinth) **(LI)**	m3	8	
	Test cubes			
316	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	4	
	Concrete sundries			
	Finishing top surfaces of concrete smooth with a wood float			
317	Surface beds, slabs, etc. **(LI)**	m2	54	
	40Mpa Non-shrink grout:			
318	Bedding approximately 300 x 40mm thick	m	52	
	Formwork (CPAP Work Group No. 111)			
	Smooth formwork to sides			
319	Upstand beams (Plinth) **(LI)**	m2	46	
320	Edges, risers, ends and reveals not exceeding 300mm high or wide **(LI)**	m	42	
	Reinforcement (CPAP Work Group No. 114)			
	High tensile steel reinforcement to structural concrete work			
321	Bars of various diameters **(LI)**	t	2,16	
	Waterproofing (CPAP Work Group No. 120)			
	One layer of 375 micron waterproof sheeting sealed at laps as per approval			
322	Under surface beds including sides **(LI)**	m2	64	
	Carried Forward			R

Bill No. 18
External Works

	Brought Forward			R
	Metalwork (CPAP Work Group No. 136)			
	80 x 8mm Thick heavy duty GMS plate fixed on to reinforced concrete plinth			
323	4980mm long flat plate	No	10	
	SAND, OIL AND GREASE TRAP			
	Earthworks (CPAP Work Group No. 104)			
	Excavation in earth not exceeding 2m deep			
324	Holes (LI)	m3	9	
	Extra over all excavations for carting away			
325	Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor	m3	8	
	Risk of collapse of excavations			
326	Sides of trench and hole excavations exceeding 1,5m and not exceeding 3m deep	m2	17	
	Compaction of surfaces			
327	Compaction of ground surface under floors, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% mod AASHTO density	m2	7	
	Earth filling obtained from excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density			
328	Backfilling to trenches, holes, etc. (LI)	m3	1	
	Prescribed density tests on filling			
329	Modified AASHTO Density tests	No	2	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Approved anti-termite soil insecticide applied by a Registered Pest Control Company and guaranteed against termite infestation for ten years including forming and poisoning shallow furrows along sides of foundation walls, etc., filling in and ramming:			
330	Under floors, sides, etc. including forming and poisoning shallow furrows against foundation walls etc., filling in furrows and ramming **(LI)**	m2	24	
	Concrete (CPAP Work Group No. 110)			
	Reinforced concrete cast against excavated surfaces			
	30MPa/19mm concrete			
331	Surface base **(LI)**	m3	2	
	Reinforced concrete cast against on/in formwork			
	30MPa/19mm concrete			
332	Slabs **(LI)**	m3	1	
	Test cubes			
333	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	2	
	Concrete sundries			
	Finishing top surfaces of concrete smooth with a wood float			
334	Surface beds, slabs, etc. **(LI)**	m2	13	
	Formwork (CPAP Work Group No. 111)			
	Smooth formwork to soffits			
335	Slabs, propped up not exceeding 3.5m high **(LI)**	m2	6	
	Smooth formwork to sides			
336	Edges, risers, ends and reveals not exceeding 300mm high or wide **(LI)**	m	39	
	Carried Forward			R

Bill No. 18
External Works

				R
	Brought Forward			
	Boxing in smooth formwork to form			
337	Extra over formwork to form opening size 225 x 225mm through 180mm thick slab **(LI)**	No	2	
338	Extra over formwork to form opening size 550mm diameter through 180mm thick slab **(LI)**	No	3	
	Movement Joints, Etc.			
	Two sheets of tempered hardboard (smooth sides together) to form slip joint between abutting horizontal concrete and brickwork surfaces			
339	Not exceeding 300mm wide **(LI)**	m	14	
	Reinforcement (CPAP Work Group No. 114)			
	High tensile steel reinforcement to structural concrete work			
340	Bars of various diameters **(LI)**	t	0,15	
	Fabric reinforcement			
341	Type Ref. 193 fabric reinforcement in concrete surface beds, slabs, etc. **(LI)**	m2	7	
	Masonry (CPAP Work Group No. 116)			
	Brickwork of NFX bricks in class II mortar			
342	Half brick walls **(LI)**	m2	3	
343	One brick walls **(LI)**	m2	9	
	Brickwork sundries			
	2.5mm Galvanised brickwork reinforcement			
344	75mm Wide reinforcement built in horizontally **(LI)**	m	12	
345	155mm Wide reinforcement built in horizontally **(LI)**	m	35	
	Waterproofing (CPAP Work Group No. 120)			
	Carried Forward			R

				R
	Brought Forward			
	One layer of 375 micron Brikgrip DPC embossed damp proof course as per approval			
346	In walls **(LI)**	m2	3	
	One layer of 375 micron waterproof sheeting sealed at laps as per approval			
347	Under surface beds **(LI)**	m2	7	
	Drainage (CPAP Work Ground No. 146 Unless Otherwise Stated)			
	uPVC pipes cast into concrete slabs, fixed to soffit and walls, or chased into walls, chased into concrete, etc. in accordance with manufacturers specifications			
348	110mm Pipes **(LI)**	m	9	
	Extra over uPVC pipes for:			
349	110mm Bend **(LI)**	No	5	
350	110mm Junction **(LI)**	No	2	
	Gratings, covers, etc.			
351	225 x 255mm, cast iron cover and frame including	No	2	
352	550mm Diameter x 176kg, type 2A cast iron cover and frame including	No	3	
	COVERED WALKWAY			
	Earthworks (CPAP Work Group No. 104)			
	Excavation in earth not exceeding 2m deep			
353	Bases **(LI)**	m3	213	
	Extra over all excavations for carting away			
354	Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor	m3	110	
	Carried Forward			R

Bill No. 18
External Works

R RJ 287

				R
	Brought Forward			
	Risk of collapse of excavations			
355	Sides of trench and hole excavations exceeding 1,5m and not exceeding 3m deep	m2	710	
	Compaction of surfaces			
356	Compaction of ground surface under bases, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% mod AASHTO density	m2	213	
	Earth filling obtained from excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density			
357	Backfilling to trenches, holes, etc. **(LI)**	m3	103	
	Earth filling of G5 material supplied by contractor from commercial sources in accordance with SABS 1200 DM compacted to 98% Mod AASHTO density in 150mm thick layers			
358	Under bases, etc. **(LI)**	m3	32	
	Prescribed density tests on filling			
359	Modified AASHTO Density tests	No	23	
	Concrete (CPAP Work Group No. 110)			
	Unreinforced concrete cast against excavated surfaces			
	15MPa/19mm concrete			
360	Surface blinding under bases **(LI)**	m3	11	
	Reinforced concrete cast against excavated surfaces			
	30MPa/19mm concrete			
361	Base **(LI)**	m3	64	
	Reinforced concrete cast against on/in formwork			
	Carried Forward			R

Bill No. 18
External Works

R. RT

				R
	Brought Forward			
	30MPa/19mm concrete			
362	Stub columns **(LI)**	m3	4	
	Test cubes			
363	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	11	
	40Mpa Non-shrink grout			
364	Bedding approximately 25mm thick under base plate including chamfered edges all round	m2	6	
	Holding down bolts, etc			
365	Set out and embed 100mm long M12 holding down bolts with 30 x 30 end plates in top of concrete in exact position	No	148	
	Formwork (CPAP Work Group No. 111)			
	Smooth formwork to sides			
366	Stub columns **(LI)**	m2	71	
	Reinforcement (CPAP Work Group No. 114)			
367	Various diameter bars in high tensile steel reinforcement **(LI)**	t	8,50	
	Roof Coverings, Etc. (CPAP Work Group No. 124)			
	0.6mm thick colour coated galvanised sheet metal double-interlocking concealed fix profiled roofing fixed to timber purlins (timber purlins elsewhere measured)			
368	Roof covering with pitches not exceeding 25 degrees fixed at walkways.	m2	508	
	Sundries			
369	Ridge capping 550mm girth 3 times bent and notched on site to suit roof profile	m	200	
	Carried Forward			R

					R
	Brought Forward				
370	Hip capping 550mm girth 3 times bent and notched on site to suit roof profile	m	16		
	0.6mm aluminium sheet				
371	Lining to valleys with riveted and sealed joints, with girth not exceeding 600mm.	m	8		
	Carpentry and Joinery (CPAP Work Group No. 126)				
	Pre-treatment of timber				
	This service falls within the areas defined in the National Building Regulations for treatment of timber against insect infestation / insect pest affecting softwood fixed permanently in all buildings.				
	The regulations require that the timber be treated in terms of SABS 05 and to comply with SABS 457, 753, 754 or 1288 as relevant. Tenderer`s are to make allowance in there rates.				
	Sawn softwood:				
372	50 x 75mm Purlins	m	652		
373	50 x 228mm Rafter	m	464		
	Laminated Wrot Saligna				
374	76 x 222mm Beams	m	434		
	"Everite Nutec" or other equally approved medium density pressed fibre-cement				
375	15 x 255mm Fascias, including galvanised steel H-profile joiners	m	217		
376	80 x 275mm Angle section barge board, including galvanised steel H-profile joiners	m	247		
	Metalwork (CPAP Work Group No. 136)				
	Hot Dipped Galvanised Sundry Steelwork				
	Carried Forward				R

				R
	Brought Forward			
	Brackets, posts, etc. to roof timbers, etc.			
377	100 x 100 x 3mm Hollow section post 2750mm high with 200 x 200 x 10mm thick base plate welded to one end and the other end welded to and including purpose made U-shaped bracket to suit 76 x 222mm high timber beam (Timber beam elsewhere measured) with 6 No. M8 pre-drilled holes on bracket and 4 No. M10 pre-drilled holes on base plate to suit site conditions.	No	148	
	Plumbing an Drainage (CPAP Work Group No. 148)			
	0,9mm Pre-coated aluminium seamless gutter colour brown with baked enamel finish, including hanger brackets, etc.			
378	Purpose made 150 x 125mm Eaves gutters	m	217	
379	Extra over gutter for stop end	No	16	
380	Extra over gutter for corner	No	15	
381	Extra over gutter for outlet	No	36	
	0,9mm Pre-coated aluminium seamless rainwater downpipes colour brown with baked enamel finish, including holder butts, etc.			
382	100 x 100mm Rainwater downpipes	m	126	
383	Extra on rainwater pipe for bend	No	72	
384	Extra on rainwater pipe for shoe	No	36	
	Paintwork (CPAP Work Group No. 152)			
	Two coats Carbolineum			
385	On exposed trusses **(LI)**	m2	690	
	One coat primer, one coat universal undercoat and two coats "Velvaglo Polyurethane Enamel" or equal and approved paint			
386	On fascia and barge boards **(LI)**	m	464	
	Carried Forward			R

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R

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	Brought Forward			R
	Prepare and apply one coat of zinc chromate primer one coat universal undercoat and two coats of universal SABS approved gloss enamel paint. Colour to be chosen by Architect.			
387	On steel posts **(LI)**	m2	163	
	COVERED CARPORTS			
	Earthworks (CPAP Work Group No. 104)			
	Excavation in earth not exceeding 2m deep			
388	Bases **(LI)**	m3	106	
	Extra over all excavations for carting away			
389	Surplus material from excavations and/or stock piles on site,to a dumping site to be located by the contractor	m3	54	
	Risk of collapse of excavations			
390	Sides of trench and hole excavations exceeding 1,5m and not exceeding 3m deep	m2	302	
	Compaction of surfaces			
391	Compaction of ground surface under bases, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% mod AASHTO density	m2	106	
	Earth filling obtained from excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density			
392	Backfilling to trenches, holes, etc. **(LI)**	m3	52	
	Earth filling of G5 material supplied by contractor from commercial sources in accordance with SABS 1200 DM compacted to 98% Mod AASHTO density in 150mm thick layers			
393	Under bases, etc. **(LI)**	m3	16	
	Carried Forward			R

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	Brought Forward			
	Prescribed density tests on filling			
394	Modified AASHTO Density tests	No	11	
	Concrete (CPAP Work Group No. 110)			
	Unreinforced concrete cast against excavated surfaces			
	15MPa/19mm concrete			
395	Surface blinding under bases (LI)	m3	5	
	Reinforced concrete cast against excavated surfaces			
	30MPa/19mm concrete			
396	Base (LI)	m3	32	
	Reinforced concrete cast against on/in formwork			
	30MPa/19mm concrete			
397	Stub columns (LI)	m3	3	
	Test cubes			
398	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	6	
	40Mpa Non-shrink grout			
399	Bedding approximately 25mm thick under base plate including chamfered edges all round	m2	2	
	Holding down bolts, etc			
400	Set out and embed 100mm long M12 holding down bolts with 30 x 30 end plates in top of concrete in exact position	No	54	
	Formwork (CPAP Work Group No. 111)			
	Smooth formwork to sides			
401	Stub columns (LI)	m2	65	
	Carried Forward			R

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External Works

				R
	Brought Forward			
	Reinforcement (CPAP Work Group No. 114)			
402	Various diameter bars in high tensile steel reinforcement **(LI)**	t	4,38	
	Structural Steel (CPAP Work Group No. 134)			
	Welded columns in single lengths with flat section base, top, bearer and connection plates bolted to reinforced concrete at bottom and parallel flanged channel at top			
403	100 x 100 x 4 SHS Column	t	1,05	
	Welded beams in single lengths with flat section bearer and connection plates bolted to columns			
404	200 IPE Main Beam	t	3,55	
	Welded purlins, bracing, trimmers, eaves runner, etc. with flat section connection plates bolted to steel			
405	175 x 50 x 20 x 3 CFLC purlins	t	4,31	
406	40 x 40 x 3 Angle purlins (sag bar)	t	0,27	
407	40 x 40 x 4 Angle bracing	t	1,75	
	Sundry Steelwork			
408	Cleats, plates, gussets, connectors, etc.	t	3,04	
	Paintwork			
	Remove all grease and oil by washing with a water emulsifiable solvent degreaser and rinsing with potable water, dry abrasive blast to rear white metal in accordance with Sa 2.5 of the International Standard ISO 850-1 to obtain a surface profile of 25 - 75 microns and apply one coat Inter guard 269 galvanizing primer and two coats Interthane 990 re-coatable polyurethane			
409	On columns, beams, purlins, angles, etc.	t	10,93	
410	On cleats, plates, gussets, connectors, etc.	t	2,86	
	Carried Forward			R

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External Works

				R
	Brought Forward			
	Roof Coverings, Etc. (CPAP Work Group No. 124)			
	Profiled Metal Sheeting and Accessories			
	0.6mm thick colour coated galvanised sheet metal double-interlocking concealed fix profiled roofing fixed to steel purlins (steel purlins elsewhere measured)			
411	Roof covering with pitch not exceeding 25 degrees	m2	738	
	Sundries			
412	Barge flashing, 550mm girths	m	149	
413	Fascia flashing, 550mm girths	m	125	
	Plumbing an Drainage (CPAP Work Group No. 148)			
	0,9mm Pre-coated aluminium seamless gutter colour brown with baked enamel finish, including hanger brackets, etc.			
414	Purpose made 150 x 125mm Eaves gutters	m	125	
415	Extra over gutter for stop end	No	4	
416	Extra over gutter for outlet	No	14	
	0,9mm Pre-coated aluminium seamless rainwater downpipes colour brown with baked enamel finish, including holder butts, etc.			
417	100 x 100mm Rainwater downpipes	m	42	
418	Extra on rainwater pipe for bend	No	28	
419	Extra on rainwater pipe for shoe	No	14	
	RAINWATER TANKS AND BASES			
	Earthworks (CPAP Work Group No. 104)			
	Excavation in earth not exceeding 2m deep			
420	Holes (LI)	m3	88	
	Carried Forward			R

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External Works

R. 01 295

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	Brought Forward			
	Extra over all excavations for carting away			
421	Surplus material from excavations and/or stock piles on site,to a dumping site to be located by the contractor	m3	10	
	Risk of collapse of excavations			
422	Risk of collapse of sides of trench excavations exceeding 1.5m deep	m2	118	
	Compaction of surfaces			
423	Compaction of ground surface under floors compacted to 95% Mod. AASHTO density	m2	90	
	Earth filling obtained from excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density			
424	Earthfilling from the excavations as backfilling to trenches compacted to 95% Mod. AASHTO density **(LI)**	m3	78	
	Prescribed density tests on filling			
425	Modified AASHTO Density tests	No	13	
	Approved anti-termite soil insecticide applied by a Registered Pest Control Company and guaranteed against termite infestation for ten years including forming and poisoning shallow furrows along sides of foundation walls, etc., filling in and ramming:			
426	Under floors, sides, etc. including forming and poisoning shallow furrows against foundation walls etc., filling in furrows and ramming **(LI)**	m2	208	
	Concrete (CPAP Work Group No.110)			
	Reinforced concrete cast against excavated surfaces			
	30MPa/19mm concrete			
427	Surface bases **(LI)**	m3	23	
428	Surface bed **(LI)**	m3	7	
	Reinforced concrete cast against on/in formwork			
	Carried Forward			R

Bill No. 18
External Works

R. RJ

	Brought Forward				R
	30Mpa/19mm Reinforced concrete				
429	Filling to cavities of hollow walls **(LI)**	m3	12		
	Test Cubes				
430	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	7		
	Concrete Sundries				
	Finishing top surfaces of concrete smooth with a wood float				
431	Surface beds, slabs, etc. **(LI)**	m2	155		
	Rough Formwork (CPAP Work Group No. 111)				
432	Strip footings (Provisional) **(LI)**	m2	60		
	Reinforcement (CPAP Work Group No. 114)				
	Mild and high tensile steel reinforcement to structural concrete work				
433	Various diameter bars **(LI)**	t	3,33		
	Fabric reinforcement				
434	Type ref. 193 fabric reinforcement in concrete surface beds, slabs, etc. **(LI)**	m2	65		
	Masonry (CPAP Work Group No. 116)				
	Brickwork of NFP bricks in class II mortar				
435	One brick walls **(LI)**	m2	42		
436	330mm Hollow walls of two half brick skins, including wire ties, to receive concrete infill (Concrete infill elsewhere measured) **(LI)**	m2	100		
	Brickwork sundries				
	2.5mm Galvanised brickwork reinforcement				
437	155mm Wide reinforcement built in horizontally **(LI)**	m	949		
	Carried Forward				R

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External Works

R RY

	Brought Forward			R
	Brickwork sundries			
	Bagging of 1:3 cement and sand mixture			
438	On brick walls, piers, etc. **(LI)**	m2	110	
	Face brickwork			
	"Agate" travertine FBX or other equally approved face bricks pointed with tinted recessed horizontal and vertical joints			
439	Extra over brickwork for face brickwork wall **(LI)**	m2	110	
440	Extra over brickwork for brick-on-edge header course bands one course high **(LI)**	m	110	
	Waterproofing (CPAP Work Group No. 120)			
	Two coats emulsion bitumen emulsion waterproof coating as per approval			
441	On bagged brick walls, piers, etc. **(LI)**	m2	110	
	Plumbing (CPAP Work Group No. 148)			
	Polyethylene rainwater tanks, etc.			
442	5000 Litres "JoJo" rainwater tank or other equally approved, with 100 x 100mm opening for downpipe from gutter including 50mm diameter overflow opening and outlet union for 20mm tap (tap elsewhere measured) and place in position on plinth and secure with twisted double strand 4mm galvanised wire.	No	10	
	Taps, valves, etc.			
443	Hose bib tap, brass including 3/4 hose union, etc. (Code: COB-208-20)	No	10	
	Plastering (CPAP Work Group No. 142)			
	Screeds wood floated, on concrete			
444	Average 170mm thick on floors to falls **(LI)**	m2	27	
	LANDSCAPING			
	Carried Forward			R

R RJ

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	Brought Forward			
	(CPAP WORK GROUP NO. 104 UNLESS OTHERWISE STATED)			
	Ground preparation			
445	Site clearance	m2	4 543	
446	Rip and prepare areas to receive planting/lawn/seeding	m2	4 543	
	Topsoil, compost, lime and fertilizer			
447	Import topsoil for planting/lawn/seeding areas (100mm) **(LI)**	m3	454	
448	Final shaping of planting/lawn/seeding areas **(LI)**	m2	4 543	
449	Compost to planting areas (50mm) **(LI)**	m3	227	
450	Fertilizer to planting/lawn beds (50g/m²) **(LI)**	kg	227	
	Grassing, Trees, etc			
	Supply and plant the following plants			
451	Lampranthus at the rate of five per square metre **(LI)**	m2	118	
452	Chondropetalum at the rate of three per square metre **(LI)**	m2	97	
453	Heteropyxis Natalensis 200mm high **(LI)**	No	37	
454	Podocarpus Henkel 200mm high **(LI)**	No	33	
	Supply and plant the following grass			
455	Grass planting to level areas with Cynadon Dactylon continuous root planting described including all necessary fertiliser, weed killer, watering and rolling, mowing, etc. **(LI)**	m2	4 543	
	Maintenance			
456	Maintenance of grassed areas for a period of 4 months (total area approximately 4543m²) including regularly cutting, weeding and irrigating as necessary **(LI)**		Item	
	Carried Forward			R

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External Works

	Brought Forward			R
	Outdoor furniture			
457	"Builders Merchant" or other equally approved quality garden concrete benches (two number) and table (one number), fixed to ground surfaces with approved epoxy glue **(LI)**	No	25	
458	"SA Bins" or other equally approved 500mm Diameter x 740mm high concrete ribbed round litter bin (grey colour finish), fixed to ground surfaces with approved epoxy glue **(LI)**	No	17	
	Carried to Summary			R

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