



Water Treatment Works: Summary Cost and Scope Norms for the Preparation of UPPF Projects

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Notes: A) Indicative project sizes, capital values and preparation scopes have been utilised - in reality there will be variations and a standard project preparation template is not possible. B) Project Capital Value is inclusive of all project costs (e.g. project preparation fees, engineering design fees, construction supervision and construction costs). C) Preparation management is at 15% because of a high ratio of complexity relative to the cost of project preparation / diseconomies of scale (i.e. small preparation budgets vs implementation budgets but high complexity).

Disclaimer: Whilst these toolkits have been made available by UPPF for external consumption, including use in support of the CIDB's 'Gateway' process for preparing infrastructure projects, it is emphasized that these toolkits are a work-in-progress and should not be used in a prescriptive fashion. UPPF will update these toolkits from time to time based on experience gained in preparing specific projects. Any suggestions for improvements or refinements should be emailed to UPPF / PPT for the attention of the National Co-ordinator on pptrust@worldonline.co.za

General UPPF Assumptions: 1) Contract and / or Tender Documentation for project implementation is an additional activity / service provided on request; 2) The intensity of the scope of work outlined below has generally been kept to the minimum necessary to determine: a) the viability of the project and b) a preliminary concept and rough estimate for construction / implementation. The limited budgets typically available for preparing projects have also been taken into consideration. 3) Professionals / companies who undertake preparation work will also be eligible to tender for implementation work. Should this not be the case, then it is likely that there will be an additional cost premium given the reduced potential for professionals to earn profit.

Project Specific Considerations: The following require further consideration for possible inclusion above: 1) Include revenue collection / sustainable model for WTW upgrades - how will it pay for itself 2) Reserve determination 3) Specialist EIA studies

Description: Upgrade of existing sewage treatment plant. Size of project can vary considerably. Typical capital costs can be expected to range from R5,0 to R40,0 million.

Assumptions:

Minimum Project Capital Value (R): 5,000,000
Maximum Project Capital Value (R): 40,000,000

Estimate of effort (reflected as working hour equivalent):	Hours (min)	Hours (max)	Budget excl. VAT (min)	Budget excl. VAT (max)
Subtotal for Civil	87	169	73950	143650
Subtotal for Process	47	105	38950	87250
Subtotal for Electrical	6	12	5100	10200
Subtotal for Social	68	132	21200	40400
Subtotal for Environmental	333	363	166500	181500
Subtotal for Laboratory work, Geotech & Survey	10	48	3500	42400

Preparation Scope:	Professional	Hours (min)	Hours (max)	Rate	Budget excl. VAT (max)	Budget excl. VAT (max)
PRELIMINARY ASSESSMENT STAGE						
i) Site visit	Civil	8	8	850	6,800.00	6,800.00
	Process	2	6	850	1,700.00	5,100.00
ii) Municipal Prioritisation confirmation	Civil	10	12	850	8,500.00	10,200.00
iii) Status Quo on existing infrastructure	Process	4	8	850	3,400.00	6,800.00
	Civil	6	8	850	5,100.00	6,800.00
		24	28		20,400.00	23,800.00
		6	14		5,100.00	11,900.00
Total for Preliminary Assessment Stage					25,500.00	35,700.00

Preparation Scope:	Professional	Hours (min)	Hours (max)	Rate	Budget excl. VAT (max)	Budget excl. VAT (max)
PRE FEASIBILITY STAGE (CIDB 'Assessment')						
A. Situational Analysis including influent characteristics and treatment plant assessment:						
i) Analyze raw water flows (average daily flows, peak flows and demands);	Civil	2	6	850	1,700.00	5,100.00
ii) Analyze raw water characteristics,	Process	2	5	850	1,700.00	4,250.00
iii) Analyze existing treatment plant capacities.	Civil	2	6	850	1,700.00	5,100.00
	Process	2	5	850	1,700.00	4,250.00
iv) Analyse treatment processes	Process	4	10	850	3,400.00	8,500.00
v) Analyze and assess existing unit treatment process capacity and plant management.	Process	2	6	850	1,700.00	5,100.00
vi) Confirm legislative and environmental requirements.	Environmental	4	12	500	2,000.00	6,000.00
	Process	2	4	850	1,700.00	3,400.00
vii) Comment on seasonal raw water quality fluctuations and risk.	Environmental	4	12	500	2,000.00	6,000.00
	Process	2	4	850	1,700.00	3,400.00
viii) Comment on staffing levels and current plant classification	Civil	2	5	850	1,700.00	4,250.00
	Process	2	2	850	1,700.00	1,700.00

ix) Obtain copies of existing allocation and comment on compliance & sufficiency.	Environmental	8	12	500	4,000.00	6,000.00
	Process	2	4	850	1,700.00	3,400.00
B. Future Treatment capacity assessment					-	-
i) Assess the catchment demographic profile	Civil	3	6	850	2,550.00	5,100.00
	Social	8	20	300	2,400.00	6,000.00
ii) Confirm development plans (residential and industrial)	Civil	2	4	850	1,700.00	3,400.00
	Social	8	18	300	2,400.00	5,400.00
iii) Consider raw water assumptions and quality fluctuation.	Civil	2	4	850	1,700.00	3,400.00
iv) Recommend remedial actio for quality and risk factors.	Civil	2	4	850	1,700.00	3,400.00
v) Assess the expected changes in raw water quality.	Process	2	4	850	1,700.00	3,400.00
vi) Assess the different changes in raw water from different sources if applicable.	Civil	2	3	850	1,700.00	2,550.00
	Process	1	2	850	850.00	1,700.00
vii) Assess back wash, chemical wash sludge treatment and raw water disposal requirments	Civil	1	2	850	850.00	1,700.00
	Process	1	2	850	850.00	1,700.00
C. Effluent sample testing					-	-
In the likely event that no recent and reliable data already exists	Testing Lab	10	16	350	3,500.00	5,600.00
D. Problem statement					-	-
Meetings with client municipality etc.	Civil	2	6	850	1,700.00	5,100.00
	Process	2	4	850	1,700.00	3,400.00
	Subtotal for Civil	20	46		17,000.00	39,100.00
	Subtotal for Process	24	52		20,400.00	44,200.00
	Subtotal for Social	16	38		4,800.00	11,400.00
	Subtotal for Environmental	16	36		8,000.00	18,000.00
	Subtotal for Lab	10	16		3,500.00	5,600.00
Total for Pre-Feasibility Stage					53,700.00	118,300.00

Preparation Scope:	Professional	Hours (min)	Hours (max)	Rate	Budget excl. VAT (max)	Budget excl. VAT (max)
FEASIBILITY STAGE (CIDB 'Concept')						
A. Assessment of upgrading options, recommendations and decision on preferred concept:						
i) Assessment of infrastructure upgrading such as modification or extensions of existing plant components	Civil	2	4	850	1,700.00	3,400.00
	Process	2	4	850	1,700.00	3,400.00
ii) Assessment of upgrading of treatment processes,	Civil	4	8	850	3,400.00	6,800.00
	Process	8	14	850	6,800.00	11,900.00
iii) Assessment of peak demand; and management issues - includes meetings / workshop with client municipality technical staff.	Civil	1	3	850	850.00	2,550.00
	Process	1	3	850	850.00	2,550.00
iv) Assessment and resolution of Waste Management, and other licensing requirements.	Environmental	2	4	500	1,000.00	2,000.00
B. Geotechnical assessment: (where extensions / new build is required)	Geotechnical	0	12	1050	-	12,600.00
C. Geotechnical samples and tests	Geotech Lab	0	4	1050	-	4,200.00
D. Survey					-	-
Where as built drawings are insufficient	Surveyor	0	16	1250	-	20,000.00
E. Conceptual design of preferred upgrading options					-	-
i) Process modifications, new site, new process, recovery streams etc.	Civil	2	8	850	1,700.00	6,800.00
	Process	2	10	850	1,700.00	8,500.00
ii) First stage sizing of new plant components incl. upgrading of mechanical and electrical infrastructure, etc.	Civil	2	8	850	1,700.00	6,800.00
F. Logistical assessment & plan:	Process				-	-
i) logistics and plan for implementation (e.g. material suppliers, transport, road access)	Civil	2	4	850	1,700.00	3,400.00
ii) operational logistics (e.g. long term conveyance of coagulant, lime, sludge etc).	Civil	4	8	850	3,400.00	6,800.00
iii) maintenance logistics (e.g. access to M&E equipment, removal and re-instatement etc.)	Civil	4	8	850	3,400.00	6,800.00
G. EPWP / local job creation:					-	-
i) plan for creation of local skills development and work opportunities during construction	Civil	2	4	850	1,700.00	3,400.00
	Social	4	15	300	1,200.00	4,500.00
ii) classification of the proposed works and assessment of operator training needs	Civil	2	4	850	1,700.00	3,400.00
	Process	2	4	350	700.00	1,400.00
iii) identification of formalised training needs and facilitation thereof	Civil	2	4	850	1,700.00	3,400.00
	Process	2	4	850	1,700.00	3,400.00
	Social	8	15	300	2,400.00	4,500.00

H. Preliminary environmental Assessment: Determine if a listed activity is triggered	Environmental	8	16	500	-	-
I. Community participation and consultation ongoing throughout the above process	Social	24	48	300	4,000.00	8,000.00
J. Environmental Approvals:						
i) Basic Environmental Assessment for minor works, or	Environmental	18	18	500	9,000.00	9,000.00
ii) Environmental Impact Assessment where required on major changes (e.g. expansions, sludge handling, constructed wetlands, storm attenuation etc.)	Environmental	289	289	500	144,500.00	144,500.00
K. Implementation Estimates & Programme:						
i) Estimates for capital costs,	Civil	2	4	850	1,700.00	3,400.00
	Electrical	2	4	850	1,700.00	3,400.00
ii) Operation and maintenance costs (10 to 15 year life span),	Civil	2	4	850	1,700.00	3,400.00
	Electrical	2	4	850	1,700.00	3,400.00
iii) Financial viability and socio economic analysis	Civil	2	4	850	1,700.00	3,400.00
	Social	16	16	350	5,600.00	5,600.00
iv) Detailed programme (timetable) for implementation	Civil	2	4	850	1,700.00	3,400.00
	Electrical	2	4	850	1,700.00	3,400.00
L. Final report & MIG/MIS Application Form:						
Follow up on required approvals	Civil	8	16	850	6,800.00	13,600.00
	<i>Subtotal for Civil</i>	<i>43</i>	<i>95</i>		<i>36,550.00</i>	<i>80,750.00</i>
	<i>Subtotal for Process</i>	<i>17</i>	<i>39</i>		<i>13,450.00</i>	<i>31,150.00</i>
	<i>Subtotal for Electrical</i>	<i>6</i>	<i>12</i>		<i>5,100.00</i>	<i>10,200.00</i>
	<i>Subtotal for Social</i>	<i>52</i>	<i>94</i>		<i>16,400.00</i>	<i>29,000.00</i>
	<i>Subtotal for Environmental</i>	<i>317</i>	<i>327</i>		<i>158,500.00</i>	<i>163,500.00</i>
	<i>Subtotal for Geo&Survey</i>	<i>0</i>	<i>32</i>		<i>-</i>	<i>36,800.00</i>
Total for Feasibility Stage					230,000.00	351,400.00

Summary of Costs Per Stage

Total for Preliminary Assessment Stage	25,500.00	35,700.00
Total for Pre-Feasibility Stage	53,700.00	118,300.00
Total for Feasibility Stage	230,000.00	351,400.00
Total Direct Cost Preparation Budget	309,200.00	505,400.00
Travel & minor disbursements at 7.5%	23,190.00	37,905.00
Project Preparation Management at 15%	46,380.00	75,810.00
Subtotal 1	378,770.00	619,115.00
Contingencies at 5%	18,938.50	30,955.75
TOTAL	397,708.50	650,070.75
Total preparation budget - assumed project value	15,000,000.00	15,000,000.00
Total Preparation costs as a percent of total project cost (including capital)	2.7%	4.3%