

Mote Park Lake Reservoir Engineering Services
Options Appraisal Report

Costing of Options

Cost Base Q1 2018

Items	Assumptions	Rate	Units	Quantities					Cost					
				Option 1	Option 1A	Option 2	Option 2A	Option 3	Option 1	Option 1A	Option 2	Option 2A	Option 3	
				C1 (50m) Armorflex	C1 (65m) Armorflex	C2 (50m) Stepped Concrete	C2 (65m) Stepped Concrete	A2 (40m) + C2 (50m) A2 (Stepped Concrete) C2 Stepped Concrete)	C1 (50m) Armorflex	C1 (65m) Armorflex	C2 (50m) Stepped Concrete	C2 (65m) Stepped Concrete	A2 (40m) + C2 (50m) A2 (Stepped Concrete) C2 Stepped Concrete)	
Enabling Works														
Services - provisional items	Assumes water main is abandoned	£ 10,000	Sum	2	2	2	2	2	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000
Tree clearance	numbers taken from App E	£ 10,000	Sum	2	2	2	2	7	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 70,000
Auxiliary Spillway														
Excavation of soil	Approx cross sectional areas taken from 122775-BVL-20-00-SK-Z-00001 multiplied by length of spillway with 20% E/O	£ 16	m ³	1980	2574	1980	2574	3276	£ 31,680	£ 41,184	£ 31,680	£ 41,184	£ 52,416	£ 52,416
E/O Rock excavation	Assumed 10% of excavated material for C and none for A as per App E	£ 47	m ³	198	257.4	198	257.4	198	£ 9,306	£ 12,098	£ 9,306	£ 12,098	£ 9,306	£ 9,306
Disposal of unsuitable material off-site	Assumed volume above as per App E - 10% of material reused for local ground raising	£ 50	m ³	1782	2317	1782	2317	2948	£ 89,100	£ 115,830	£ 89,100	£ 115,830	£ 147,420	£ 147,420
Imported fill (clay)	Assume 300mm thick layer is required across face of spillway with 10m ³ for core of earth embankments	£ 42	m ³	215	273.5	215	273.5	431	£ 9,030	£ 11,487	£ 9,030	£ 11,487	£ 18,102	£ 18,102
Armorflex 220	Slope is 13m long with additional 10m provided to create toe	£ 63	m ²	1150	1495	0	0	0	£ 72,450	£ 94,185	£ -	£ -	£ -	£ -
Topsoil	Rates from SPONS 2015 imported topsoil 250mm thick (pg 188) trimming angle 10-45degrees (pg190) prep. angle 10-45degrees (pg190)	£ 12	m ²	1150	1495	0	0	0	£ 14,007	£ 18,209	£ -	£ -	£ -	£ -
Concrete steps	Assume same rate as concrete slab in App E Approx. cross section area calculated from 122775-BVL-20-00-SK-Z-00001 - assuming base of conc is 1m below face	£ 300	m ³	0	0	600	780	1120	£ -	£ -	£ 180,000	£ 234,000	£ 336,000	£ 336,000
Reinforcement (75kg/m ³)		£ 1,575	t	0	0	45	58.5	84	£ -	£ -	£ 70,875	£ 92,138	£ 132,300	£ 132,300
Soil dowels to resist uplift	no. assumed as per App E	£ 300	No.	0	0	100	100	180	£ -	£ -	£ 30,000	£ 30,000	£ 54,000	£ 54,000
Mass concrete (toe/edge beam)	Assume toe/edge beam section = 500mmx500mm	£ 184	m ³	0	0	6.5	6.5	15.5	£ -	£ -	£ 1,196	£ 1,196	£ 2,852	£ 2,852
Reinforced concrete crest anchor block	Anchor block: 1m x1m x length	£ 231	m ³	50	65	0	0	0	£ 11,550	£ 15,015	£ -	£ -	£ -	£ -
Reinforced concrete (crest weir, side walls, toe, seepage cut-off)	Shear key: Area = 1.2m ² Anchor block: Area = 1.5m ² Reinforced steps: Area = 10m ² Option "C" Shear key: Area = 1.2m ² Anchor block: Area = 1.5m ² Reinforced steps: Area = 10m ² Assume 500mm thick retaining walls: Assume retaining walls 2m high CSA = 1m ² Option "A" Width spillway (direction of flow)= 32m Option "C": Width spillway (direction of flow)=23m	£ 231	m ³			658	848.5	1198	£ -	£ -	£ 151,998	£ 196,004	£ 276,738	£ 276,738
RediRock precast concrete blocks (retaining walls)	Budget rate for schemes at the outline design stage from CPM-Group. Assume side walls cross sectional area = 3m ²	£ 270	m ²	86	86	0	0	0	£ 23,220	£ 23,220	£ -	£ -	£ -	£ -
Reinforcement (125kg/m ³)		£ 1,575	t	6	8	82	106	150	£ 9,844	£ 12,797	£ 129,544	£ 167,048	£ 235,856	£ 235,856
Formwork	Worked out as proportion of reinforced concrete (proportion assumed as per App E)	£ 95	m ²	23	30	307	396	559	£ 2,217	£ 2,882	£ 29,171	£ 37,617	£ 53,111	£ 53,111
Sheetpiling up to 6m deep	Reinforced concrete options C2 and A	£ 184	m	0	0	0	0	41	£ -	£ -	£ -	£ -	£ 7,544	£ 7,544
Scour Protection (Rock Armour)	Rate from SPONS Imported Rock fill (pg421) Assume layer extends 5m from base of slope and is 1m thick	£ 38	m ³	0	0	250	325	450	£ -	£ -	£ 9,620	£ 12,506	£ 17,316	£ 17,316

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Wavewall / Embankment														
Excavation of soil	Assume volumes as per App E	£ 16	m ³	150	150	150	150	330	£ 2,400	£ 2,400	£ 2,400	£ 2,400	£ 5,280	
E/O Rock excavation		£ 47	m ³	0	0	0	0	0	£ -	£ -	£ -	£ -	£ -	
Disposal of unsuitable material off-site		£ 50	m ³	150	150	150	150	330	£ 7,500	£ 7,500	£ 7,500	£ 7,500	£ 16,500	
Imported fill (clay)	Assume volumes as per App E	£ 42	m ³	300	300	450	450	990	£ 12,600	£ 12,600	£ 18,900	£ 18,900	£ 41,580	
Footpath/road surfacing (including sub-base)	not used	£ 95	m ²	0	0	0	0	0	£ -	£ -	£ -	£ -	£ -	
Mass concrete foundation to wall	not used - Assumed RediRock foundation reinforced	£ 184	m ³	0	0	0	0	0	£ -	£ -	£ -	£ -	£ -	
Reinforced concrete foundation/ cut-off for rediRock wall	Assumed 1m high x 2m wide x 111m long	£ 231	m ³	222	222	222	222	142	£ 51,282	£ 51,282	£ 51,282	£ 51,282	£ 32,802	
Reinforcement (125kg/m ³) (foundation for RediRock wall)		£ 1,575	t	28	28	28	28	18	£ 43,706	£ 43,706	£ 43,706	£ 43,706	£ 27,956	
Formwork (foundation to wall)	Assumed formwork to 4 vertical faces of foundation. Base height: 1m.	£ 95	m ²	226	226	226	226	284	£ 21,470	£ 21,470	£ 21,470	£ 21,470	£ 26,980	
Masonry cladding	not used	£ 147	m ²	0	0	0	0	0	£ -	£ -	£ -	£ -	£ -	
RediRock precast concrete blocks	Budget rate for schemes at the outline stage from CPM-Group. Wall length: 1111m for "C" & 71m for "A". Wall height: 2m	£ 270	m ²	222	222	222	222	142	£ 59,940	£ 59,940	£ 59,940	£ 59,940	£ 38,340	
Sheetpiling up to 6m deep	not used	£ 184	m	0	0	0	0	0	£ -	£ -	£ -	£ -	£ -	
1.8m high mesh security fence (H&S)	Assumed fence removed for safety and for part construction of RediRock wall.	£ 180	m	90	90	90	90	90	£ 16,200	£ 16,200	£ 16,200	£ 16,200	£ 16,200	
West Drive Bridge works														
Modify existing parapets/make good	Rate as per App E	£ 5,000	Sum	1	1	1	1	1	£ 5,000	£ 5,000	£ 5,000	£ 5,000	£ 5,000	
Bespoke heritage open balustrades and coping	Price for bespoke balustrading varies for job to job, Quote requires drawing or sketch with the exact dimensions for the coping. Procter Cast Stone standard balustrading is £350/m ² (5no/m). Allow £500/m ² .	£ 500	m ²	30	30	30	30	30	£ 15,000	£ 15,000	£ 15,000	£ 15,000	£ 15,000	
Footpath/road surfacing (including sub-base)		£ 95	m ²	9	9	9	9	9	£ 855	£ 855	£ 855	£ 855	£ 855	
Replacement footbridge	not used								£ -	£ -	£ -	£ -	£ -	
Sluice Gate														
Not yet defined (Guestimate).	RISK ITEM (Preliminary design, specialist surveys, temporary/permanent works).		Sum	1	1	1	1	1	£ -	£ -	£ -	£ -	£ -	
Temporary works														
Cofferdams in reservoir	Rate as per App E	£ 120	m ²	0	0	0	0	120	£ -	£ -	£ -	£ -	£ 14,400	
Groundwater control in excavations	Rate as per App E	£ 1,680	week	8	8	8	8	16	£ 13,440	£ 13,440	£ 13,440	£ 13,440	£ 26,880	
Pumping to lower/control RWL	Rate as per App E	£ 2,783	week	0	0	0	0	16	£ -	£ -	£ -	£ -	£ 44,528	
Temporary access road, including site Heras fencing	Rate as per App E	£ 236	m	120	120	120	120	320	£ 28,320	£ 28,320	£ 28,320	£ 28,320	£ 75,520	
Total (measured Items)									£ 590,117	£ 664,620	£ 1,065,533	£ 1,275,120	£ 1,820,783	
Contingency / Risk	Percentage of net total	10%							£ 59,012	£ 66,462	£ 106,553	£ 127,512	£ 182,078	
Minor items		5%							£ 29,506	£ 33,231	£ 53,277	£ 63,756	£ 91,039	
Contractors prelims / supervision		30%							£ 177,035	£ 199,386	£ 319,660	£ 382,536	£ 546,235	
Contractors overhead and profit		15%							£ 88,518	£ 99,693	£ 159,830	£ 191,268	£ 273,117	
Construction Sub-Total									£ 944,187	£ 1,063,392	£ 1,704,853	£ 2,040,193	£ 2,913,253	

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Other works														
Diversion of UKPN equipment		£ 75,000	Sum	1	1	1	1	1	£ 75,000	£ 75,000	£ 75,000	£ 75,000	£ 75,000	£ 75,000
Relocate container for Mote Park Boat Club	Works will be undertaken by contractor.	£ 20,000		1	1	1	1	1	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000
Sub-Total									£ 95,000	£ 95,000	£ 95,000	£ 95,000	£ 95,000	£ 95,000
Professional fees, surveys, etc														
Engineering (QCE, design and supervision)		10%							£ 94,419	£ 106,339	£ 170,485	£ 204,019	£ 291,325	
GI for detailed design		£ 11,500		1	1	1	1	1	£ 11,500	£ 11,500	£ 11,500	£ 11,500	£ 11,500	£ 11,500
Ecological surveys/inputs		£ 45,000		1	1	1	1	1	£ 45,000	£ 45,000	£ 45,000	£ 45,000	£ 45,000	£ 45,000
UXO Survey		£ 1,650		1	1	1	1	1	£ 1,650	£ 1,650	£ 1,650	£ 1,650	£ 1,650	£ 1,650
Topographical Survey		£ 3,300		1	1	1	1	1	£ 3,300	£ 11,500	£ 11,500	£ 11,500	£ 11,500	£ 11,500
Environmental mitigation	Costs associated with Environmental mitigation to support planning application have not been determined during Stage 1 (appraisal of options) stage and will be assessed during "Environmental studies- Stage 2". Consultations with Planning, MBC, interested parties and specialist will be required before a final estimate can be arrived at. A PROVISIONAL budget estimate of £100k has been allowed.	£ 100,000		1	1	1	1	1	£ 100,000	£ 100,000	£ 100,000	£ 100,000	£ 100,000	£ 100,000
Other fees		£ 20,000		1	1	1	1	1	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000	£ 20,000
									£ -	£ -	£ -	£ -	£ -	£ -
Sub-Total									£ 275,869	£ 295,989	£ 360,135	£ 393,669	£ 480,975	
Project Cost														
Sub-total Project Cost									£ 1,315,055	£ 1,454,381	£ 2,159,989	£ 2,528,862	£ 3,489,228	
Contingency		20%							£ 263,011	£ 290,876	£ 431,998	£ 505,772	£ 697,846	
TOTAL									£ 1,578,066	£ 1,745,257	£ 2,591,986	£ 3,034,634	£ 4,187,073	