



Estimation of Costs
Case 1 Underpass

	text	quantities	unit	unite price lower limit	unite price upper limit	unite price avarage	factor of difficulty *)2	total	chapter sum	further explanations
	01. building underpass								952 938.88 €	
	land acquisition and reimbursements								3 381.00 €	
	reimbursements for temporary use									
	site areas, excavation pit, construction road	980.00	m2	3.00 €	3.90 €	3.45 €	1.00	3 381.00 €		*)1
	excavation pit								140 070.00 €	
	pit excavation abutment	1175	m3	20.00 €	26.00 €		1.00	27 025.00 €		transportation costs for excavation are not included
	backfill (filled in layers around 30cm and compressed)	2260	m3	35.00 €	45.50 €	23.00 €	1.00	90 965.00 €		*)1
	soil improvement qualified	625	m3	27.00 €	35.10 €	40.25 €	1.00	19 406.25 €		*)1
	soil improvement with concrete	0	m3	100.00 €	130.00 €	115.00 €	1.00	0.00 €		*)1
	compressing subsoil	465	m2	5.00 €	6.50 €	5.75 €	1.00	2 673.75 €		*)1
	dismantling existing structure								0.00 €	
	If there is an existing structure or building which has to be dismantled, the costs have to be taken into account.	0.00	m3	300.00 €	390.00 €	345.00 €	1.00	0.00 €		optional
	new construction of underpass								775 275.38 €	
	clear construction field	980.00	m2	5.00 €	6.50 €	5.75 €	1.00	5 635.00 €		*)1
	recultivation of construction field	980.00	m2	5.00 €	6.50 €	5.75 €	1.00	5 635.00 €		*)1
	topsoil excavation	465	m2	2.50 €	3.25 €	2.88 €	1.00	1 336.88 €		*)1
	application of top soil	465	m2	5.00 €	6.50 €	5.75 €	1.00	2 673.75 €		*)1
	granular subbase in final position	170	m2	25.00 €	32.50 €	28.75 €	1.00	4 887.50 €		*)1
	foundation reinforced concrete	190	m3	250.00 €	325.00 €	287.50 €	1.00	54 625.00 €		*)1
	drilling pile Ø 90 to 120 cm	0	m	450.00 €	585.00 €	517.50 €	1.00	0.00 €		optional
	operation drilling equipment	0	psch*)3	20 000.00 €	26 000.00 €	23 000.00 €	1.00	0.00 €		optional
	side wall reinforced concrete	155	m3	400.00 €	520.00 €	460.00 €	1.00	71 300.00 €		*)1
	wing wall reinforced concrete	295	m3	400.00 €	520.00 €	460.00 €	1.00	135 700.00 €		*)1
	superstructure prefabricated elements reinforced concrete	90	m3	700.00 €	910.00 €	805.00 €	1.00	72 450.00 €		*)1
	basic transportation costs prefabricated elements	14	St	500.00 €	650.00 €	575.00 €	1.00	8 050.00 €		includes all basics, like a transporter is needed, prefabricated elements have to be uploaded, fixed for transportation and have to be unloaded etc. quantitie presumed
	transportation way costs prefabricated elements	100	1/km	5.00 €	6.50 €	5.75 €	1.00	575.00 €		includes costs for driver, fuel, temporary barriers, escort vehicle, temporary dismantle of obstacles etc. adjust with the factor of difficulty depending on difficulty of transportation way situation
	mobile crane operation for assembly	0.5	day	10 000.00 €	13 000.00 €	11 500.00 €	1.00	5 750.00 €		
	supersturcture cast in-situ deck reinforced concrete	85	m3	700.00 €	910.00 €	805.00 €	1.00	68 425.00 €		*)1
	rebar for reinforced concrete	160	t	1 100.00 €	1 430.00 €	1 265.00 €	1.00	202 400.00 €		150 to 200 kg/m3
	edge beam reinforced concrete	50	m3	790.00 €	1 027.00 €	908.50 €	1.00	45 425.00 €		*)1
	cable duct cover	74	m	25.00 €	32.50 €	28.75 €	1.00	2 127.50 €		*)1
	railing	75	m	240.00 €	312.00 €	276.00 €	1.00	20 700.00 €		*)1
	protective concrete	145	m2	50.00 €	65.00 €	57.50 €	1.00	8 337.50 €		*)1
	bitumen waterproofing superstructure	145	m2	65.00 €	84.50 €	74.75 €	1.00	10 838.75 €		*)1
	bituminous coating for areas which are in contact with soil	180	m2	10.00 €	13.00 €	11.50 €	1.00	2 070.00 €		*)1
	drainage wall (drainage concrete stones)	55	m2	30.00 €	39.00 €	34.50 €	1.00	1 897.50 €		*)1
	construction joints	26	m	15.00 €	19.50 €	17.25 €	1.00	448.50 €		*)1
	drainage system	1	psch	15 000.00 €	19 500.00 €	17 250.00 €	1.00	17 250.00 €		
	grounding	1	psch	2 500.00 €	3 250.00 €	2 875.00 €	1.00	2 875.00 €		
	bridge equipment, dummy joints, logo with year	1	psch	2 500.00 €	3 250.00 €		1.00	2 875.00 €		dummy joint = a slot cut into a concrete slab to prevent serious fractures
	concrete elastomer joint	75	m	90.00 €	117.00 €	103.50 €	1.00	7 762.50 €		*)1
	track junction profile	26	m	250.00 €	325.00 €	287.50 €	1.00	7 475.00 €		*)1
	internal grounding	1	psch	5 000.00 €	6 500.00 €	5 750.00 €	1.00	5 750.00 €		
	temporary structures and building aids								34 212.50 €	
	waterpumping	1	psch	10 000.00 €	13 000.00 €	11 500.00 €	1.00	11 500.00 €		depends on landscape conditions, depending on amount of waterpumping factor of difficulty must be choosen between 0.5 - 5.0
	support structure and protective scaffolding	1	psch	15 000.00 €	19 500.00 €	17 250.00 €	1.00	17 250.00 €		
	working scaffold for edge beams	1	psch	3 500.00 €	4 550.00 €	4 025.00 €	1.00	4 025.00 €		
	construction of site road	25	m3	30.00 €	39.00 €	34.50 €	1.00	862.50 €		assumed value, depends on local conditions
	dismantling of site road	25	m3	20.00 €	26.00 €	23.00 €	1.00	575.00 €		assumed value, depends on local conditions
	built sheeting	0	m2	350.00 €	455.00 €	402.50 €	1.00	0.00 €		optional
	use of device for driving work	0	psch	20 000.00 €	26 000.00 €	23 000.00 €	1.00	0.00 €		optional

[illegible]

	total	per m2/bridge	
only construction costs	952 938.88 €	4 537.80 €	
subtotal construction costs	1 114 938.48 €	5 309.23 €	
planning costs	222 987.70 €		20 - 25% of subtotal construction costs, calculated with 20%
total costs CAPEX (net)	1 337 926.18 €	6 371.08 €	
total costs OPEX (net)/ year	14 294.08 €	68.07 €	1.5% of only construction costs

*1) Depends on dimensions of underpass. The amount is for the shown case. For other dimensions the amount changes and thus the total price.

*2) factor to describe the level of difficulty, for factors of costs which can differ very much depending on location (e.g. for waterpumping) this faktor can be set to a value higher than 1

*3) psch = lump sum

additional information

- prices are experience values from previous and current ongoing projects of MKP in Germany. Prices can allways differ depending on country, economic situation etc.
- tracks, ballast, rails etc. are not included in price