



Estimation of Costs
Case 4 Road Overpass

| | 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 road overpass | | | | | | | | 1 221 535.75 € | |
| | land acquisition and reimbursements | | | | | | | | 5 571.75 € | |
| | reimbursements for temporary use | | | | | | | | | |
| | site areas, excavation pit, construction road | 1 615.00 | m2 | 3.00 € | 3.90 € | 3.45 € | 1.00 | 5 571.75 € | | *)1 |
| | excavation pit | | | | | | | | 56 666.25 € | |
| | pit excavation | 1235 | m3 | 20.00 € | | 23.00 € | 1.00 | 28 405.00 € | | transportation costs for excavation are not included |
| | backfill (filled in layers around 30cm and compressed) | 625 | m3 | 35.00 € | 45.50 € | 40.25 € | 1.00 | 25 156.25 € | | *)1 |
| | soil improvement qualified | 0 | m3 | 27.00 € | 35.10 € | 31.05 € | 1.00 | 0.00 € | | |
| | soil improvement with concrete | 0 | m3 | 100.00 € | 130.00 € | 115.00 € | 1.00 | 0.00 € | | |
| | compressing subsoil | 540 | m2 | 5.00 € | 6.50 € | 5.75 € | 1.00 | 3 105.00 € | | *)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 road overpass | | | | | | | | 1 123 935.25 € | |
| | clear construction field | 1 615.00 | m2 | 5.00 € | 6.50 € | 5.75 € | 1.00 | 9 286.25 € | | *)1 |
| | recultivation of construction field | 1 615.00 | m2 | 5.00 € | 6.50 € | 5.75 € | 1.00 | 9 286.25 € | | *)1 |
| | topsoil excavation | 770 | m2 | 2.50 € | 3.25 € | 2.88 € | 1.00 | 2 213.75 € | | *)1 |
| | application of top soil | 770 | m2 | 5.00 € | 6.50 € | 5.75 € | 1.00 | 4 427.50 € | | *)1 |
| | granular subbase in final position | 250 | m2 | 25.00 € | 32.50 € | 28.75 € | 1.00 | 7 187.50 € | | *)1 |
| | foundation abutment reinforced concrete | 200 | m3 | 250.00 € | 325.00 € | 287.50 € | 1.00 | 57 500.00 € | | *)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 | 75 | m3 | 400.00 € | 520.00 € | 460.00 € | 1.00 | 34 500.00 € | | *)1 |
| | wing wall reinforced concrete | 70 | m3 | 400.00 € | 520.00 € | 460.00 € | 1.00 | 32 200.00 € | | *)1 |
| | foundation pier walls reinforced concrete | 175 | m3 | 250.00 € | 325.00 € | 287.50 € | 1.00 | 50 312.50 € | | *)1 |
| | pier walls reinforced concrete | 110 | m3 | 400.00 € | 520.00 € | 460.00 € | 1.00 | 50 600.00 € | | *)1 |
| | superstructure prefabricated elements reinforced concrete | 150 | m3 | 700.00 € | 910.00 € | 805.00 € | 1.00 | 120 750.00 € | | *)1 |
| | basic transportation costs prefabricated elements | 15 | St | 500.00 € | 650.00 € | 575.00 € | 1.00 | 8 625.00 € | | 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 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 |
| | transportation way costs prefabricated elements | 100 | 1/km | 5.00 € | 6.50 € | 5.75 € | 1.00 | 575.00 € | | |
| | mobile crane operation for assembly | 2 | day | 10 000.00 € | 13 000.00 € | 11 500.00 € | 1.00 | 23 000.00 € | | |
| | supersturcture cast in-situ deck reinforced concrete | 170 | m3 | 700.00 € | 910.00 € | 805.00 € | 1.00 | 136 850.00 € | | *)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 | 80 | m3 | 790.00 € | 1 027.00 € | 908.50 € | 1.00 | 72 680.00 € | | *)1 |
| | railing | 140 | m | 240.00 € | 312.00 € | 276.00 € | 1.00 | 38 640.00 € | | *)1 |
| | Ooverhead catenary protection system | 40 | m | 800.00 € | 1 040.00 € | 920.00 € | 1.00 | 36 800.00 € | | |
| | protection device | 205 | m | 300.00 € | 390.00 € | 345.00 € | 1.00 | 70 725.00 € | | *)1 |
| | protective concrete | 820 | m2 | 50.00 € | 65.00 € | 57.50 € | 1.00 | 47 150.00 € | | *)1 |
| | bitumen waterproofing superstructure | 820 | m2 | 65.00 € | 84.50 € | 74.75 € | 1.00 | 61 295.00 € | | *)1 |
| | bituminous coating for areas which are in contact with soil | 120 | m2 | 10.00 € | 13.00 € | 11.50 € | 1.00 | 1 380.00 € | | |
| | drainage wall (drainage concrete stones) | 55 | m2 | 30.00 € | 39.00 € | 34.50 € | 1.00 | 1 897.50 € | | |
| | construction joint | 24 | m | 15.00 € | 19.50 € | 17.25 € | 1.00 | 414.00 € | | |
| | 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 € | | 2 875.00 € | 1.00 | 2 875.00 € | | dummy joint = a slot cut into a concrete slab to prevent serious fractures |
| | concrete elastomer joint | 140 | m | 90.00 € | 117.00 € | 103.50 € | 1.00 | 14 490.00 € | | |
| | internal grounding | 1 | psch | 5 000.00 € | 6 500.00 € | 5 750.00 € | 1.00 | 5 750.00 € | | |
| | temporary structures and building aids | | | | | | | | 35 362.50 € | |
| | waterpumping | 1 | psch | 10 000.00 € | | 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 | 45 | m3 | 30.00 € | 39.00 € | 34.50 € | 1.00 | 1 552.50 € | | assumed value, depends on local conditions |
| | dismantling of site road | 45 | m3 | 20.00 € | 26.00 € | 23.00 € | 1.00 | 1 035.00 € | | 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 |

| | 02 disposal | | | | | | | | 0.00 € | |
|--|--|---|------|--------------|---|--------------|------|--------------|--------------|---|
| | If there is an existing structure or building which has to be dismantled, the costs for disposal have to be taken into account. excavation | 0 | t | 24.55 € | 31.92 € depends on reuse for other bridges, e.g. animal overpass and for other sites; contamination etc. | 28.23 € | 1.00 | 0.00 € | | |
| | 03 Other | | | | | | | | 207 661.08 € | |
| | construction site equipment | 1 | psch | 122 153.58 € | 122 153.58 € | 122 153.58 € | 1.00 | 122 153.58 € | | 10% of construction costs |
| | traffic safety | 0 | psch | 5 000.00 € | 6 500.00 € | 5 750.00 € | 1.00 | 0.00 € | | optional, depends on traffic crossing in location of bridge |
| | traffic light control during construction time | 0 | psch | 8 000.00 € | 10 400.00 € | 9 200.00 € | 1.00 | 0.00 € | | optional, depends on traffic crossing in location of bridge |
| | security requirements | 1 | psch | 24 430.72 € | 24 430.72 € | 24 430.72 € | 1.00 | 24 430.72 € | | 2% of total construction costs |
| | construction planning | 1 | psch | 61 076.79 € | 61 076.79 € | 61 076.79 € | 1.00 | 61 076.79 € | | 5% of construction costs |

| | | | total | per m2/bridge | |
|-----------------------------|--|--|----------------|---------------|--|
| only construction costs | | | 1 221 535.75 € | 2 035.89 € | |
| subtotal construction costs | | | 1 429 196.83 € | 2 381.99 € | |
| planning costs | | | 285 839.37 € | | 20 - 25% of subtotal construction costs, calculated with 20% |
| total costs CAPEX (net) | | | 1 715 036.19 € | 2 858.39 € | |
| total costs OPEX (net) | | | 18 323.04 € | 30.54 € | 1.5% of CAPEX |

- *)1

Depends on dimensions of road overpass. The amount is for the shown case. For other dimensions the amount changes and thus the total price.

bridge area

600 m2
- *)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 infromation

- 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