

Energy & Environment - Hydro Tunnels

No.	Project	Client	Type of Work	Contract Value (EUR)	Work Period	Job Description
1	Vishnugad Pipalkoti Hydroelectric Project	THDC Tehri Hydro Development Corporation	TBM Tunnel Expert Services, Project Review, Risk Management	200,000	2000 – 2013	The Project has been designed as a 444 Megawatt, hydropower generation scheme which, when completed, will generate approximately 1,800 Megawatt of energy.
2	Sewer Channel Interceptor Belgrade TA	En Plus (City of Belgrade) Belgrade / Serbia	Tender documents Design, Expert Services	33,000	2001 – 2012	Preparation of Tender documents for a 7 km long inner-urban sewer tunnel, diameter 4.10 m, Construction Supervision and Technical Assistance start in early summer 2007.
3	WSK-E Wientalsamm elkanal	ARGE WSKE Porr Tunnelbau - Bilfiger Berger Vienna / Austria	Detailed Design Expert Services	76,600	2003 – 2005	Detail design and structural calculation for a TBM water tunnel with length of 2.5 km, inner diameter of 7.5 m. The tunnel is planned as an overflow tunnel in case of heavy rain.
4	Waterpower Station Tongbai SBC	Zhejiang Provincial Electric Power Company (ZPEPC) Hangzhou / PR China	Consultancy Expertise	36,000	2002 – 2004	Pumped storage hydro power station with intake structure from existing upper reservoir, inclined tunnels, bifurcation, pressure tunnels, underground power house and machine hall, tailrace tunnels and new lower reservoir with earth fill dam. Services include technology transfer and design review
5	Mumbai Sewage Disposal Project	Angerlehner Ltd. Pucking / Austria	Expert Services, Member of Arbitration Tribunal	23,220	2001 – 2005	Rehabilitation of a sewer project with different cross sections. The existing sewer to be renamed by a special cutting machine and fibre reinforced tensional resin materials for the new inner lining.
6	Wanjiazhai Yellow River Diversion Project	Wanjiazhai Yellow River Diversion Project Corporation Taiyuan / PR China	Expert Services	1,425,850	1996 – 2001	Technical assistance to the client for Lot I, II & III of the South Main during the design and construction phase. Review of final design, opening and evaluation of tenders, meetings and site visit with bidders, negotiation and award of contract, preparation of tender documents, etc.
7	Sewer Tunnel Berlin Biesdorf – Wassmannsdorf	ARGE ADL BIE-WA VIII Berlin / Germany	Tender design Expert Services	66,842	1996 – 2001	Detailed design of a TBM driven sewer tunnel with a total length of 5,4 km. The tunnel with an inner diameter of 3.0 m crosses with an overburden of maximal 25 m dense build-up house estates and industry area.
8	Sewer Tunnel Queensway Contract T-06	Babtie BMT - Harris & Sutherland Singapore	Tender design Expert Services	24,275	1998 – 2000	Tender design for the sewer tunnel including 9 shafts. The tunnel alignment (length 9,500 m, Diameter 3.3 m, overburden 20 – 45 m) is being excavated in soft ground. The inner diameters of the shafts are 3.0 m or 1.8 m respectively, depth XXX to 47 m.
9	Sewer Tunnel Ang Mo Kio Contract T-04	Babtie BMT - Harris & Sutherland Singapore	Tender design Expert Services	9,800	1999 – 2000	Tender design for sewer tunnel, 7 shafts and one connection tunnel. The tunnel alignment (length 7,200 m, diameter 4.3 m, overburden 30 – 40 m) as well as the connection tunnel (length 793 m, diameter 1.8 m), are being excavated in sand and silt. The inner diameters of the shafts are 3.0 m or 1.8 m respectively, depth up to 42 m.
10	Sewer Tunnel Changi Contract T-01	Babtie BMT - Harris & Sutherland Singapore	Tender design Expert Services	45,000	1998 – 1999	Tender design for the sewer tunnel and 4 shafts. The whole tunnel alignment (length 5,900 m, diameter 6 m) with an overburden between 36 – 40 m soft ground formations. The inner diameters of the shafts are 3.0 m or 1.8 m respectively, and their depth up to 40 m.

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11	Water Diversion Project Tunnel "Sir Adam Beck" Ontario / Canada	Parsons Brinckerhoff New York / USA	Expert Services	22,500	1998 – 1999	Consultancy services incl. design review related to the one pass segment lining of the TBM water tunnel with an inner diameter of 12.50 m and a total length of approx. 10 km.
12	Hydropower Project Dai Ninh Da Lat / Vietnam	PIDC 2 Electricity of Vietnam Ho Chi Minh City / Vietnam	Detailed design segmental lining construction consultancy Expert Services	103,500	1999 – 2000	The project consists of 2 main embankment dams, 4 saddle dams, 1 service spillway, one emergency spillway, a 11.2 km long TBM tunnel, a 1.8 km long penstock, a 300 MW powerhouse with associated tailrace tunnel and switchyard. It has subsurface structures like free-flow tunnel, compression tunnel, inclined chute, etc. Review of design and bidding documents. Field investigations and hydrological assessments, geotechnical evaluations, structural analysis.
13	Water Supply Tunnel „Hofoldingner Stollen“ Munich / Germany	Mayreder Bau GmbH Salzburg / Austria	Tender design Expert Services	4,950	1997 – 1999	Tender design for the segmental lining of a TBM water tunnel with an inner diameter of 2.20 m and a length of 17,450 m in soft ground. Conceptual design in 3 alternatives and structural calculations with regard to the pressure of 10 bar on the segmental lining.
14	Water Supply Tunnel „Hachinger Stollen“ Munich / Germany	Mayreder Bau GmbH Salzburg / Austria	Tender design Expert Services	4,500	1996 – 1997	Tender design and structural calculation for a TBM water tunnel, with regard to the pressure of 10 bar on the segmental lining. The tunnel with an overburden of 35 m, an inner diameter of 2.20 m and a length of 2,400 m is excavated in soft ground. The ground water table is approx. 15 m above the tunnel roof
15	Wanjiazhai Yellow River Diversion Project Taiyuan Shanxi Province / PR China	Wanjiazhai Yellow River Diversion Project Corporation Taiyuan / PR China	Tender documents specification geological reports Expert Services	548,970	1997 – 1996	Tender documents detailed design for 4 tunnels excavated by TBM and conventional method with total length approx. 1km Technical specifications, costs estimates and geological reports.
16	Power Plant Shi Dong Kou – Phase II Shanghai / PR China	Shanghai Tunnel Engineering Co. LTD. Shanghai / PR China	Settlement analysis Conceptual Design Expert Services	9,000	1996 – 1997	Calculation of de-formations and settlements of the segmental lined tunnel by FEM Analysis. Total length approx. 1km, outer diameter of 5.5 m.
17	Power Plant & Outfall Tunnel Beillun Shanghai / PR China	Shanghai Tunnel Engineering Co. LTD. Shanghai / PR China	Settlement analysis Conceptual Design Expert Services	9,000	1996 – 1997	Calculation of de-formations and settle-ments of the segmental lined tunnel by FEM Analysis. Total length approx. 1km, outer diameter of 4.5 m..
18	Wanjiazhai Yellow River Diversion Project Taiyuan Shanxi Province / PR China	The World Bank Washington DC / USA	Pumping station layout Expert Services	60,000	1995 – 1996	Water supply with a total length of approx. 200 km in TBM & Conventional tunnel construction and pumping stations. Consultancy Services and design review. Friction loss calculations, verification of tunnel progress.
19	Hydropower Station Ybbs on River Danube Ybbs-Persenbeug / Austria	Österreichische Donaukraft AG, Parking 12 Vienna / Austria	Detailed design, open pit and tunnel, Expert Services	57,600	1995 – 1996	Structural design for excavation and support of up to 40 m deep inlet- and outlet channel. A NATM driven inlet tunnel beneaths an existing hydropower station. Tunnel dimension: Length of approx. 30 m, height of approx. 15 m, width of approx. 13 m. Encountered rock formations are

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20	Sewer Rehabilitation Project "Bürgerstrasse"	Municipality of Innsbruck / Austria	FEM Analysis construction consultancy Expert Services	10,800	1995 – 1996	Rehabilitation of existing egg shaped sewers under traffic conditions. Sewer's enlargement by milling, installation of composite fiberglass reinforced lining including gap grouting, and connections for house sewers. Total length 85 m, egg cross section of 55/110 cm.
21	Innsbruck / Austria Hydropower & Water Diversion Tunnel Dhiarizos	Mayreder & Zachariades J.V. Austria / Cyprus	FEM Back Analysis Expert Services	31,500	1993 – 1994	Back Analysis for critical section between station 4000-8000. Swelling tunnel effects caused instability and invert heaving. (total length 14.5 km, outer diameter 3.00 m).
22	Dhiarizos / Cyprus Sewer Rehabilitation Project "Rainer-Kolschitzkygasse"	Municipality Department MA 30 Vienna / Austria	FEM Analysis Expert Services	28,800	1993 – 1994	Rehabilitation of existing egg shaped sewers under traffic conditions. Sewer's enlargement by milling, installation of composite fiberglass reinforced lining including gap grouting, shafts construction and connections for house sewers. Total length of 380 m, egg cross section of 80/120 cm.
23	Vienna / Austria Hydropower Station & Tunnel Obere Sill	Municipality of Innsbruck, Austria	Detailed Design Expert Services	36,450	1982 – 1984	Construction concepts for TBM -driven tunnels with precast concrete invert segment, conventional initial lining and cast in place final lining (length of approx. 5.8 km, diameter of 3.6 m)
24	Province of Tyrol / Austria Atatürk Hydropower & URFA Irrigation Tunnels	Ünal Akpınar Ankara / Turkey	Expert Services	13,500	1982 – 1983	Feasibility study for the ventilation of 2 irrigation tunnels with a total length of approx. 52 km (2 x 26 km, diameter of approx. 8 m) during construction.
25	Southern Turkey Hydosolar Powerstation & Headrace Tunnel West & East Quattara Depression	Egyptian Government Cairo / Egypt	Expert Services	270,000	1979 – 1982	Feasibility study for water transfer project located in western Sahara, Egypt desert. Project consist of 2 tunnels with length of approx. 152 km (2 x 76 km), numerous ventilation shafts, and 4 operation points. Tunnel excavation diameter of approx. 16.70 m.
26	El Sira / Egypt Drinking Water Supply Galleries	Pars Consult Engineering & Consulting Corp. Teheran/ Iran	Design & Construction Consultancy Expert Services	54,000	1976 – 1978	Excavation and lining for the approx. 8.7 km long drinking water supply galleries. Tunnel cross section of approx. 10 m ² . Excavation by shield advance in alluvium with road-header and segmental lining. Conventional blasting advance in Dolomite limestone with TIWAG
27	Ankara / Turkey Drinking water supply for Ankara Kinik Tunnel	Kiska Ins. Ankara, Turkey	Consultancy of NATM Technology, Expert Services	22,500	1976 - 1978	Technical assistance during construction of an approx. 20 km long tunnel with inner diameter of approx. 4.0 m.