Energy & Environment - Caverns & Shafts

No.	Project	Client	Type of Work	Contract Value (EUR)	Work Period	Job Description
1	**Jurong Rock Cavern Phase 1** Singapore	Hyundai engineering Construction Ltd., Singapore	Technical Review on behalf of Client and Contractor	15,000	2010 - 2012	Total oil storage capacity (Phase 1) 1.47 Mio m^3 with 3.8 Mio m^3 of excavated rock, 5 Caverns with 27 m height, 20 m with 300 m length. Construction with Drill & Blast Rock and fault zones; Cavern floor approx. 150 m. below the ground
2	**Vishnugad Pipalkoti Hydroelectric Project** Rishikesh / India	THDC Tehri Hydro Development Corporation	Project Review, Risk Management Expert Services	200,000	2008 – 2010	The Vishnugad Pipalkoti Project has been designed as a 444 Megawatt, hydropower generation scheme which, when completed, will generate approximately 1,800 Megawatt of energy consists at 12 km Headrace Tunnel, Surge Shaft Underground, Power house and Tailor Tunnel
3	**Hydro Power Station Tongbai Pumped Storage Project** PR China	Zhejiang Provincial Electric Power Company (ZPEPC) Hangzhou / PR China	Consultancy Member of Panel of Experts	42,256	2000 – 2004	Pumped storage hydro power station with intake structure for existing upper reservoir, inclined tunnels, bifurcation, pressure tunnels, underground power house and machine halle, tailrace tunnels and new lower reservoir with earth fill them. Services include technology transfer and design review. Max. water head 286 m, Upper reservoir 12,32 x 106 m^3, Lower reservoir 12,90 x 106 m^3, Total installed capacity 1200MW, Main dam type earth / rock fill dam, penstock length / Ø 640-600 / 9,0 m, Manifold length / Ø 125-174 / 5,5-3,4 m, Underground caverns max. Dimension (l x w x h) 172 x 24 x 54 m, Transformer hall max. dimension (l x w x h) 163 x 18 x 29 m, Tailrace tunnel number / Inner Ø 4 / 7 m
4	**Hydropower Project Dai Ninh** Da Lat / Vietnam	PIDC 2 Electricity of Vietnam Ho Chi Minh City / Vietnam	Detailed design for segmental lining Construction Consultancy Expert Services	103,500	1998 – 1999	Review of design and bidding documents. Field investigations and hydrological assessments, geotechnical evaluations, structural analysis.
5	**Water Supply Tunnels Wanjiazhai Yellow River Diversion Project** Shanxi Province / PR China	Wanjiazhai Yellow River Diversion Project Corporation Taiyuan / PR China	Preparation of Tender Documents Expert Services	548,970	1995 – 1996	Tender documents for 4 tunnels excavated by TBM and conventional method with a total length of approx. 100 km. Technical specifications, costs estimates, geological reports, bill of quantities.
6	**Music Theatre "Theater im Berg"** Linz / Austria	Government of Upper Austria Linz / Austria	Design concept in rock Construction cost Estimate Expert Services	34,036	1995 – 1996	Underground Theatre in Linz incl. Garages caverns; Theatre cross section - height:18.5 m, width: 30.0 m, length: 78 m. Underground Garages - heigth 15,9 m, width 42 m, length 108 m, cross section 667.8 m^2
7	**Underground Car Parking** Hallstatt / Austria	Municipality of Hallstatt	Design study Cost proposal Expert Services	25,000	1994 – 1994	Car parks for traffic calming in the municipality of Hallstatt. Dimension approx. 85,000 m^3. Underground space use for apporx. 5,000 Cars
8	**Washington Metro Greenbelt Route Section E-004b-2** Washington DC / USA	Washington Metropolitan Area Transit Authority Washington DC / USA	Detailed design Specifications Expert Services	278,000	1992 -1995	Detailed design of NATM single track tunnels and shafts in soft ground with minimized in-fluency to the surface. FEM Analysis for running tunnels, car passage, NATM Crossing and for enlarged cross section at “Farragut” shaft. Length of the running tunnels 2 x 937 m, cross section of approx. 35 m^2.

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9	**Saudi Strategic Storage Project** Saudi Arabia		Special offer prepared for bidding Expert Services		1992 -1992	Storage with typical Cross Section of 30.35 m height and 24.7 m width. Innovative concept for Stainless Lining
10	**LA Metro "Red Line"** Los Angeles / USA	PB Parsons Brinckerhoff	Tender Design, Cost Estimate, Expert Services	663,750	1991 – 1992	The project consists of following 4 metro stations which are constructed by mined method of construction. • Hollywood / Highland, • Hollywood / Vine, • Hollywood / Western, • Vermont / Sunset
11	**NEDO - Underground Dome** Tokyo / Japan	Taisei Construction Cooperation Tokyo	Conceptual design Cost estimate Expert Services	15,000	1989 – 1989	Underground space utilization for offices, shopping center; approx. Dimension 100,000 m³. Innovative Top Down Construction using Conventional Excavation Ground with Systematic Ground Reinforcing.
12	**Underground Sport Stadium 2 Station 2 Car Parking Central Park** New York / USA	JEC Jenny Engineering Corp. S.O.,N.J., USA	Feasibility study Cost estimate Expert Services	35,000	1987 – 1987	New Yankee Station 2 Underground Car Parking, Cavern & Shaft, approx. Dimension 120.000 m³
13	**Underground Car Parking "Römerberg"** Linz / Austria	Government of Upper Austria Linz / Austria	Feasibility study Cost estimate Expert Services	21,000	1986 -1986	Garages for Approx. 56,500 Cars and 50 Busses; approx. Dimension 360,000 m³
14	**Mass Rapid Transit System Stuttgart Hasenberg Tunnel** Stuttgart / German	Federal Geman Railways Stuttgart / Germany	Design Construction Expert Services	45,375	1980 -1985	2 single track tunnels with cross passages, double track tunnel with trumpet shaped transition to single Tracks. Section including 1vertical and 1 inclined shaft. Total length of section 4,190 m
15	**Metro Station "Theresienwiese"** Munich / Germany	Arge U-Bahn München	Management of planning & Consultancy on site Expert Services	756,000	1977 - 1981	Single track subway tunnels constructed both in TBM and in NATM construction method as well as mined Metro station “Theresienwiese“. First-time implementation of universal ring in monocular construction. Prototype of mined station according to „Multiple Drift Method“. Total length of lot 2,500 m
16	**Glacier Railway Kaprun II** Salzburg / Austria	Glacier Railway Kaprun Salzburg / Austria	Construction Cost & Schedule Control	7,000,000	1972 – 1973	Construction of inclined tunnel with climbing driving with TBM for public transport in skiing area. Total length 3,300 m, slope 20°, diameter 10 m²
17	**Pressure Gallery Waldeck II** Hemfurth / Germany	Preussische Elektrizitäts AG Hannover / Germany	Construction Cost & Schedule Control	5,000,000	1970 - 1972	Construction of Pressure Gallery with NATM in argillite and greywacke area length 505 m slope 38° diameter 36 m²