

**Aachen, Industrial Park Kohlscheid, Germany**

Hole deviation measurements with inclinometer in directional drillings to search for old mining shafts (2001-04);

Client: Schützeichel GmbH & Co. KG

Aalen, Section for Heavy Road Vehicles, Germany

Installation of interstitial pressure transducers and horizontal inclinometers in measuring sections of Charlotten- and Bahnhofstreet (section for heavy vehicles) (2003);

Client: Terrasond GmbH & Co. KG

Aalen – Wasseralfingen, Germany

Execution of sliding deformer measurements in a workshop of the machine factory ALFING Kessler (2017);

Client: ALFING Kessler

ABS/NBS – New Railway Line Karlsruhe – Basel, Rastatt Tunnel, Germany

Execution of borehole jack tests with Ettlinger borehole jack, delivery and installation of pneumatic pore water pressure transducers (2012);

Client: Arge Tunnel Rastatt (Terrasond GmbH & Co. KG, Drillexpert GmbH)

ABS/NBS – New Railway Line Karlsruhe – Basel, Schliengener Vineyard, Germany

Instrumentation and operation of a data acquisition unit with alarm function for the anchor load cells of the bored pile wall, provision of the measuring results on the internet (2012-15);

Client: geon GmbH, DB Netz AG

ABS/NBS – New Railway Line Stuttgart – Augsburg, NBS - New Railway Line Wendlingen – Ulm, Germany

Installation of Trivec measuring tubes (2003);

Client: Arge Aufschluss Alaufstieg (Geomechanik, H. Anger's Söhne, Etschel + Meyer)

ABS/NBS – New Railway Line Stuttgart – Augsburg, NBS PA 2.2, Germany

Delivery and installation of electric pore water pressure transducers with electronic data loggers (2015);

Client: Terrasond GmbH & Co. KG, Glötzl GmbH

ABS/NBS – New Railway Line Stuttgart – Augsburg, NBS New Railway Line Wendlingen – Ulm, PFA 2.1, Germany

Installation of combined inclinometer/sliding deformer measuring tubes and pore water pressure transducers (2003 and 2009, 2010);

Client: Arge PFA 2.1 Albvorland (Terrasond, Waschek, Menning)

ABS/NBS - New Railway Line Stuttgart - Augsburg, Variant Hasenthal, Germany

Execution and evaluation of flexible dilatometer tests, installation of inclinometers and Trivec measuring tubes, primary stress measurements according to the method „hard inclusion“, for pre-investigation of the new railway line Stuttgart - Augsburg of the Deutsche Bahn (1995-96);

Client: Sax + Klee GmbH



ABS/NBS – New Railway Line Stuttgart – Augsburg, NBS New Railway Line Wendlingen – Ulm, Germany

Measuring of Trivec and combined inclinometer/sliding deformer tubes in PFA 2.1 and PFA 2.2 (2009);

Client: Arge WUG

Aegidienberg Tunnel, Germany

Installation of multiple extensometers and pressure cell measuring sections in the course of tunnelling works for the new railway line Koeln - Rhein/Main of the Deutsche Bahn (1999);

Client: Arge Mittelstand NBS Koeln-Rhein/Main, Los A Tunnelbau

Albruck-Dogern, Rhine Power Station, Germany

Borehole jack tests with Ettliger dilatometer, primary stress measurements with HI-cell CSIRO, monitoring of boreholes with the optic scanner ETIBS[®], insertion of boreholes with multiple interstitial pressure transducers and electronic data loggers (2004);

Client: Terrasond GmbH & Co. KG

Ansenbach, Auxiliary Bridge, Germany

Installation and measurement of 4fold settlement gauges and horizontal inclinometers in the embankments of the auxiliary bridge Ansenbach, new railway line Karlsruhe – Basel (1995-97);

Client: Wibel, Leinenkugel + Partner

Asse, Salt Mine, Remlingen, Germany

Installation of borehole pressure cells type Glötzl and type AWID in a 630 m deep borehole, from the 750 m floor (1985);

Client: gsf – Gesellschaft für Strahlen- und Umweltforschung mbH, München

Asse, Salt Mine, Remlingen, Germany

Sealing of storage rooms in saltrock - test seal; research and development programme, long-term safety analysis in connection with a multi barrier safety concept in underground radioactive waste repositories. Instrumentation and execution of measurements for evaluation of strains, stresses and temperatures etc. in the test seal and the surrounding rock. Preliminary instrumentation in a gallery above (1987-90);

Client: gsf - Gesellschaft für Strahlen- und Umweltforschung mbH, Institut für Tieflagerung, Abt. für Endlagertechnologie, München

Automation of test machines, Germany

Development and design of control system and respective software for a triaxial cell (1997);

Client: Geo-scientific department of the University of Halle-Wittenberg, Germany

B 2, Schellenberg Bridge, Germany

Execution and evaluation of borehole jack tests pressuremeter according to Ménard, support with installation of supplied Trivec measuring tubes, control measurement using a sliding micrometer (2019);

Client: Terrasond GmbH & Co. KG

BAB A 9, Exit Triptis – Exit Dittersdorf, Germany

Execution of inclinometer measurements (2006);

Client: Terrasond GmbH & Co. KG

**BAB A 38, Friedetal Bridge, Germany**

Monitoring of boreholes with the acoustic borehole scanner ABF, caliber measurement, logging of borehole running. Insertion of boreholes to Trivec measuring points and Trivec measurements (2008-09);

Client: BOG GmbH

BAB A 49 Kassel – Gemuenden, VKE 30, Germany

Installation of piezometers with electric data loggers in exploratory drillings modified to groundwater measuring points (2010);

Client: Eder Brunnenbau in Deutschland GmbH

B 289, Detour Kauerndorf, Germany

Inclinometer measurements (2018);

Client: Arge B289 Kulmbach-Münchberg (BG Roßla, Terrasond)

Babenhausen, Germany

Execution of inclinometer measurements at the embankment of the quarry pond in Babenhausen (2010);

Client: Geoingenieure Früchtenicht und Lehmann

Bad Abbach, Germany

Installation and measurement of inclinometers (1990);

Client: Stump Bohr GmbH, Ismaning

Bad Abbach, Germany

Delivery and installation of inclinometer tubes (1995);

Client: E + M Bohr-GmbH

Bad Honnef, Germany

Inclinometer measurements at the Adenauer House (2009-11);

Client: ELE Beratende Ingenieure GmbH

Bad Koesen, Germany

Monitoring of exploratory drillings with the optic scanner system ETIBS[®] and the acoustic ABF system, logging of borehole running off. Exploration for the Federal Highway B 87n, detour Bad Koesen – Saale bridge (2010);

Client: BOG GmbH

Bad Laasphe, Germany

Inclinometer measurements at the slope Kisselsdell (1998-2014);

Client: Fluhme & Sohn GmbH, Stadt Bad Laasphe

Bad Soden – Salmuenster, Germany

Inclinometer measurements in the zone of the flood control basin (2014-15, 2017-2021);

Client: Arcadis Deutschland GmbH, Wasserverband Kinzig

Bad Wildbad, Multi-Storey Car Park, Germany

Installation of extensometers and anchor load cells in the excavation wall (1982);

Client: Stadtverwaltung Bad Wildbad

Bad Wildbad, Urban By-pass Tunnel, Germany

Installation and measurement of automatic groundwater level measuring stations (1995-96)

Client: Stadtverwaltung Bad Wildbad

**Bartelsgraben/Leinachtal, Valley Bridge, Germany**

Installation of control instruments (inclinometer, piezometer) in bridge regions along the new railway line H/W South of the Deutsche Bundesbahn (1982);
Client: PrGr H/W Süd der Bahnbauzentrale, Bundesbahndirektion Nürnberg

Basha Diamer Dam Project, Pakistan

Delivery of a complete optic borehole scanner system ETIBS® for monitoring of exploration drillings of the Basha Diamer Dam Project near Chilas, Pakistan (2006);
Client: WAPDA (Pakistan Water and Power Development Authority)

Bengelbruch, Waste Dump, Germany

Execution of hydrostatic levellings for measurement of drainage pipes (1993);
Client: Landratsamt Freudenstadt

Bergheinfeld, Germany

Installation of inclinometer tubings and torsion measurement (2000);
Client: brunnen & bohren G. Marquardt

Berlin, Sony Center, Germany

Instrumentation of the combined pile - plate basement with integral elements and electric base pressure transmitters (1997);
Client: Glötzl GmbH

Berlin, Underground Railway, Lot 76 A, Lindauer Street, Germany

Installation of inclinometers for control of excavation (1983);
Client: Brechtel GmbH, Niederlassung München

Beselich, District Dump, Germany

Installation and automatic measurement of electric interstitial pressure transducers in the proving grounds of the section B3/BA2, measurement of inclinometers (1999-2003);
Client: Schützeichel GmbH & Co. KG, KAD Beselich

Biblis, Nuclear Power Station, Germany

Installation of water level and temperature sensors with electronic data loggers in boreholes for groundwater monitoring below the interim stock for radioactive waste (2004);
Client: RWE Power AG

Bibra Tunnel, Germany

Execution and evaluation of borehole jack tests with Ettliger dilatometer, installation of electric and pneumatic interstitial pressure transducers with electronic data logger, pre-investigation for the new railway line Erfurt - Halle/Leipzig of the Deutsche Bahn (1996);
Client: Terrasond GmbH + Co. KG

Bildstock Tunnel, Germany

Stress measurements according to the compensation method, assessment of stability and evaluation of reconstruction necessity of the tunnel, distometer measurements for long-term control (1991-2000);
Client: Saarbergwerke AG, Saarbrücken

Billigheim, Toxic Waste Dump, Germany

Execution of settlement and temperature measurements in drainage pipes on dump base sealing system and dump surface; display and evaluation of measured data (1989-2003);
Client: SBW Sonderabfallentsorgung Baden-Württemberg GmbH, Fellbach, HIM

**Bittelschiess, Germany**

Installation and measurement of inclinometers in the course of slope stability control of the catholic church of Bittelschiess (1994-99);

Client: Kath. Pfarrgemeinde Bittelschiess

Blaubeuren, Pump Storage Station Blautal, Germany

Installation of pore water pressure transducers and multiple extensometers with electric displacement transducers (2013);

Client: Wöltjen GmbH

Bochum, Emilstreet, Germany

Logging of borehole running off with inclinometer in collar tubes in the course of redeveloping a surface damage (2001);

Client: GFL

Boetzingen, Germany

Installation and measurement of sliding deformer tubes for settlement measurement in the quarry Hauri (2008);

Client: Terrasond GmbH & Co. KG

Bonn Kuedinghoven, Germany

Insertion of boreholes to groundwater measuring stations with electric water level sensors and electric data loggers (2000);

Client: Kühn Geoconsulting

Borehole TV Camera

Development and construction of a 38 mm borehole TV camera with triaxial magnetometer, inclinometers, white and UV light illumination, optic cut adapter (1999);

Client: IfG - Institut für Gebirgsmechanik

Bosruck Tunnel, Austria

Execution of sliding deformer measurements in the east section of the Bosruck tunnel, Highway A9 Pyhrn (2010-13);

Client: ASFINAG Service GmbH

Bossler Tunnel, Steinbuehl Tunnel, Germany

Installation of inclinometer tubes up to a depth of 140 m in exploratory drillings for the new railway line Stuttgart - Ulm of the Deutsche Bahn (1994-95);

Client: Menning GmbH, Geomechanik GmbH

Bremen, Industrial Park Hansaline, Germany

Installation of a sliding micrometer measuring tube (1999);

Client: Glötzl GmbH

Broetzingen Tunnel, Germany

Installation of a pneumatic pore water pressure transducer in an exploratory drilling (2018);

Client: Gerätebau Wiedtal Schützeichel GmbH & Co. KG

Burgberg Tunnel, Investigation Gallery and Test Tunnel, Germany

Delivery and installation of measuring instruments as well as execution, evaluation and interpretation of geotechnical measurements, new railway line M/S of the Deutsche Bundesbahn (1985-86);

Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe

**Busch Tunnel, Germany**

Installation and measurement of convergence measuring sections with distometer and of displacement measuring sections with deformeters in the course of the repair of the old Busch tunnel and for monitoring during the excavation of the new Busch tunnel, section 2600 Koeln – Aachen (2002 and 2005);

Client: Anton Feldhaus und Söhne, HOCHTIEF Construction AG

Busch Tunnel, Germany

Installation of multiple extensometers, combined sliding micrometer - / inclinometer measuring tubes and measuring sections with pressure cells for pressure and strain measurement during the excavation of the new Busch tunnel (2005);

Client: HOCHTIEF Construction AG

Calw, Bus Station, Germany

Instrumentation of the excavation wall with distant indicating multiple extensometer for stability control (1987);

Client: Stump-Bohr GmbH, Ismaning

Camphausen, Earth Dam, Germany

Installation of inclinometers and control of stability of the lock building in a heap of waste (1983);

Client: Clemens Nachf., Brebach/Saar

Charlottenfels Tunnel, Germany

Installation of inclinometers, extensometers and dilatometers measuring sections to control the Charlottenfels tunnel during the undercrossing of the Galgenbuck tunnel (2009 and 2013-19);

Client: gbm GmbH

Cirata, Power Station, Indonesia

Delivery of geotechnical measuring instruments for control of high rock slopes (1985);

Client: PP-TC-MC Joint Operation, Jakarta, Indonesia

Clausthal, Technical University, Germany

Design and construction of a 3000 kN test press (1997-98);

Client: TU Clausthal, Institute for engineering geology

Cornberger Tunnel, Germany

Installation and measurement of deformation measuring sections with the distometer (2012-2020);

Client: DB Netz AG

Darmstadt, Merck, Germany

Installation of pile head cells at piles of the combined pile - plate basement for the boiler house, building E55 (2001);

Client: Glötzl GmbH

Deggendorf, Germany

Measurement of inclinometers for excavation control of the underground car park in the passage of Deggendorf (1995-96);

Client: Geoalpha GmbH

**Denkendorf Tunnel, Germany**

Installation and measurement of multiple interstitial pressure transducers with electronic data loggers in the course of the compressed investigation program to prepare the plan to construct the Denkendorf tunnel, new railway line Nuernberg - Ingolstadt of the Deutsche Bahn (2000-05);

Client: ARGE NBS Nuernberg - Ingolstadt Los Sued

Dettingen/Erms, Germany

Inclinometer measurements at a bored pile wall for the extension of the company ElringKlinger AG (2011-15);

Client: F. Kirchhoff Systembau GmbH

Dettingen Tunnel, Germany

Execution of borehole jack tests with Ettliger dilatometer and borehole jack, installation of electrical interstitial pressure transducers with electronic data logger. Investigation programme of the Deutsche Bahn new railway line Stuttgart - Augsburg PFA2.16, 1. EKP (1997-98);

Client: Arge Tunnel Dettingen (geo-Bohrtechnik, Kling)

Dietershan Tunnel, Germany

Geotechnical instrumentation and execution of measurements, new railway line H/W Middle of the Deutsche Bundesbahn in joint venture with Glötzl Baumesstechnik Company (1983);

Client: Arge Dietershantunnel

Dittenbrunn Bridge, Valley Bridges of Zeitlofs and Schaippach, Germany

Installation of control instruments (extensometer, inclinometer, piezometer, anchor load cell) and execution of measurements, new railway line H/W South of the Deutsche Bundesbahn (1983);

Client: Arge Anger`s Söhne, Preussag AG

Doren, Austria

Insertion of boreholes to inclinometer- and interstitial pressure measuring points (2007);

Client: Reisinger Ges. m.b.H.

Dortmund, Phoenix West, Germany

Installation and measurement of combined sliding deformer / inclinometer measuring tubes (2006-07);

Client: Fluhme & Sohn GmbH

Duisburg - Rheinhausen, Rhine Bridge, Germany

Installation of combined sliding micrometer - inclinometer measuring tubes in boreholes of the pier 8 (1999);

Client: Glötzl GmbH

Ebertsberg Tunnel, Germany

Working up and installation of a continuous control system with flat jack, extensometer, distometer measured sections. Stress release measurements. Optic exploration of boreholes. Inclinometer measurements, long-term control of all electric sensors with an automatic measuring system. Collecting of data by a modem (1993-);

Client: Deutsche Bahn AG Frankfurt/M.



Ebertsbergtunnel, Ziegenbergtunnel, Germany Delivery, installation and measurement of combined sliding deformer / inclinometer tubes (2020); *Client: BG Roßla mbH*

Eichberg Tunnel, Germany

Installation of measuring cross sections along the new railway line H/W Middle of the Deutsche Bundesbahn in joint venture with Glötzl Baumesstechnik Company (1983);
Client: Boswau & Knauer AG, Ndl. Frankfurt/M

Eiterkoepfe, Dump, Germany

Measuring of a groundwater level with the help of an inclinometer probe (1998);
Client: Brechtelterra

Eltville, Germany

Inclinometer measurements for slope monitoring in the building area Moenchhanach II (1998);
Client: Schützeichel GmbH & Co. KG

Emscher Sewer, Germany

Loggings of borehole running off with inclinometer probe in exploratory drillings for the Emscher sewer lot 1 (2005-09);
Client: Arge AK Emscher Los 1 (Schützeichel GmbH & Co. KG, Terrasond GmbH & Co.)

Erlangen and Kriegenbrunn, Sluices, Germany

Installation of pore water pressure transducers and piezometers with electric data loggers in exploratory drillings (2010 and 2013);
Client: Terrasond GmbH & Co. KG, Behringer + Dittmann GmbH

Ersinger Tunnel, Germany

Installation and measurement of fissurometers (2012-16);
Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Essen, Frohnhauser Street, Germany

Monitoring of exploratory drillings with the optic scanner system ETIBS®, borehole jack tests (2012);
Client: Gerätebau Wiedtal Schützeichel GmbH & Co. KG

Ettlingen, Local Tax Office, Germany

Delivery and installation of fissurometers (2016);
Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Felstor Tunnel, Germany

Rock monitoring with extensometers and alarm device at the Felstor tunnel, railway line section 5850 (2004-10);
Client: DB Netz AG München

Finne Tunnel, Germany

Installation of electric interstitial pressure transducers with electronic data loggers in the course of pre-investigation of the new railway line Erfurt - Halle/Leipzig, section 2 (1992-93);
Client: Sax + Klee GmbH, Terrasond GmbH + Co. KG

Finnentrop, Germany

Accompanying inclinometer measurements to stabilise a sliding slope in Lehnhausen (1998);
Client: Schützeichel GmbH & Co. KG

**Flaschenhals Tunnel, Koblenz, Germany**

Execution and evaluation of borehole jack tests with flexible dilatometer. Installation of Trivec measuring tubes in the course of soil investigations along the B 42 Bendorf - Lahnstein (1993-1994);

Client: Günther Eder GmbH, Hebertsfelden

Flotzgruen, Waste Dump, Germany

Installation of measuring cross sections for soil pressure, interstitial pressure measurements (1992);

Client: BASF AG, Ludwigshafen, Ing.-Büro Josy, Speyer

Floetzgruen, Waste Dump, Germany

Fitting of the joints in shaft Q 1.3 with electric displacement transducers, connection to measuring automatic, automatic measurement of load cells using signal transmitters during the controlled lowering of the shaft elements (2007-08);

Client: BASF AG, Ludwigshafen

Forbach, Pump Storage Station, Germany

Monitoring of exploratory drillings with the optic scanner system ETIBS[®] and the acoustic ABF system, gamma ray, flowmeter, primary stress measurements with the triaxial cell CSIRO, installation of electric pore water pressure transducers with electric data loggers in the course of exploratory drillings for the extension of the EnBW pump storage station Forbach (2010);

Client: Arge PSW Forbach (Drillexpert, Terrasond, Roßla, E+M)

Frankfurt/Main, Credit Bank for Rebuilding, Germany

Installation of wire resistance strain gauges for measurement of bulkhead forces in a deep excavation (1984);

Client: Baugrundinstitut Prof. Sommer, Darmstadt

Frankfurt/Main, Deep Foundation of the Gleisdreieck-Skyscraper, Germany

Measurement of pile butt and pile foot forces, pile extension, extensometer and incline measurements, delivery and installation of measuring instruments (1983);

Client: Ing.-Büro Prof. Sommer, Darmstadt

Frankfurt/Main, La Maison Claire, Germany

Measurement of inclinometers behind the temporary building pit support system (2016);

Client: Franki Grundbau GmbH & Co. KG

Frankfurt/Main, Le Quartier Parigot, Germany

Delivery and measurement of inclinometers in the construction site 28 (2012);

Client: Franki Grundbau GmbH & Co. KG

Frankfurt/Main, Main Tower, Germany

Instrumentation of the combined pile - plate basement with pile butt cells, electric base pressure transmitters and electric interstitial pressure transducers (1997);

Client: Glötzl GmbH

Frankfurt/Main, Refrigerating Line, Airport, Germany

Installation of Trivec measuring tubes and measurements during the drilling advance (2001);

Client: Terrasond GmbH & Co. KG, Ed. Züblin AG

**Frankfurt/Main, Skyscraper Frankfurter Welle, Germany**

Instrumentation of the combined pile - plate basement with pile butt cells, el. base pressure transmitters and el. interstitial pressure transducers (1998);

Client: Glötzl GmbH

Frankfurt/Main, Suburban Train, Lots 13/14, Germany

Installation of inclinometers and inclinometer measurements in two measuring cross sections (1981); delivery and installation of convergence measuring pins, radial and tangential pressure pickups in measuring cross sections (1982);

Client: Arge Dressler KG, Prader AG, Dyckerhoff & Widmann AG

Frankfurt/Main, Suburban Train, Lot 14 a, Germany

Installation of measuring cross sections, radial and tangential stress measurements, extensometer, inclinometer (1983);

Client: Arge S 13/14, S-Bahn, Frankfurt/Main

Frankfurt/Main, Tectum Tower, Germany

Installation of a 4fold rod extensometer with sunk head, 9 m underneath the top of the ground. Instrumentation of the combined pile raft foundation with pile strain transducers, base pressure and interstitial pressure transducers (2005 and 2006);

Client: Schützeichel GmbH & Co. KG, CDM-Consult

Frankfurt/Main, Underground Railway, Lot 83 b, Germany

Installation of a measuring cross section, radial stress measurements and extensometer (1984);

Client: Huta-Hegerfeld, Frankfurt/Main

Freiburg - Donaueschingen, km 40.1 - 40.03, Germany

Installation and measurement of inclinometers (1995-);

Client: Deutsche Bahn AG, Karlsruhe

Freienohler Tunnel, Germany

Installation and measurement of a distometer measuring section, inclinometer measurements (2019-2020);

Client: Gerätebau Wiedtal Schützeichel GmbH & Co. KG, gbm – Ges. für Baugeologie und -messtechnik mbH

Freudensteintunnel, Germany

Stress measurements according to the method of compensation (2020);

Client: DB Netz AG

Freudenstein Tunnel, Germany

Geotechnical measurements, long-term control of the pilot gallery and the main tunnel, new railway line M/S of the Deutsche Bundesbahn (1991-2015);

Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe, DB ProjektBau GmbH

Freudenstein Tunnel, Germany

Water discharge measurements by installation of Thompson tumbling bays in the bottom drainage, new railway line Mannheim - Stuttgart (M/S) of the Deutsche Bundesbahn (1990-2003);

Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe, DB ProjektBau GmbH

**Freudenstein Tunnel, Pilot Gallery, Germany**

Delivery and installation of an automatic data acquisition facility, new railway line Mannheim - Stuttgart (M/S) of the Deutsche Bundesbahn (1987);

Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe

Gelsenkirchen, City Railway Ebertstreet, Line 3, Germany

Installation of a measuring cross section for radial and tangential stress measurements in the tunnel shell (1982);

Client: E. Heitkamp GmbH

Gernsbach, Road Tunnel, Germany

Installation and measurement of inclinometer in the preliminary excavation of the Gernsbach tunnel (1993-95);

Client: Karl Reif KG

Glauchau, Motorway BAB A 4, Chemnitz - Glauchau, Lots 1-3, Germany;

Execution and evaluation of borehole jack tests with Ettliger borehole jack, inclinometer measurements (1993);

Client: Terrasond GmbH + Co. KG, Geomechanik Sachsen GmbH

Greiling, Germany

Delivery, installation and measurement of sliding deformeters at the church St. Nikolaus (2015-18);

Client: LGA-Materialprüfungsamt

Grossen-Linden, Control of Railway Embankment, Germany

Execution of inclinometer measurements in the redeveloped railway embankment region near Giessen/Grossen-Linden (1990);

Client: Waschek GmbH, Langenselbold (Hessen)

Grosser Wolfsnack, Germany

Rock mass control with electric fissurometers and automatic call device above the DB railway section 3507 (2004-);

Client: gbm - Ges. für Baugeologie und -messtechnik mbH, DB International GmbH

Grosskrotzenburg, Germany

Installation of multiple extensometers with electric displacement transducers and data loggers in the E.on power station Staudinger (2009);

Client: Glötzl GmbH

Groetzingen, Waste Dump, Germany

Execution of settlement measurements and temperature measurements in drainage pipes on the temporary sealing of the dump, display and evaluation of measuring data (1993-96);

Client: Landratsamt Karlsruhe, Amt für Abfallwirtschaft

Guenterscheid Tunnel, Germany

Installation of multiple extensometers and pressure cell measuring sections in the course of tunnelling works for the new railway line Koeln - Rhein/Main of the Deutsche Bahn (1998-99);

Client: Arge Mittelstand NBS Koeln-Rhein/Main, Los A Tunnelbau

**Hamburg, Underground Railway, Germany**

Installation of geotechnical measuring instruments for control of structure behaviour (1984);

Client: Arge Tiefdüker, Dradenau

Helsa Tunnel, Germany

Installation of water level sensors with electronic data loggers in exploratory drillings for the Helsa tunnel, motorway BAB A44 VKE 11 (2004);

Client: Arge Tunnel Helsa (Roßla, BOG)

High-Mosel Bridge, Uerzig – Zeltingen, Germany

Execution of borehole jack tests with Ettlenger dilatometer and Ettlenger borehole jack. Installation and measurement of inclinometers (2007-);

Client: Erkelenzer BG, Landesbetrieb Mobilität Trier

Hinterburg Castle, Germany

Monitoring of boreholes with the optic scanner ETIBS[®], installation and measurement of inclinometers and 3d fissurometers for bedrock exploration of Hinterburg Castle near Neckarsteinach (2007-09);

Client: Hessisches Baumanagement

Hirschhagen Tunnel, Germany

Borehole deviation measurements in inclined boreholes, installation of water level sensors with electronic data loggers in exploratory drillings for the Hirschhagen tunnel, motorway BAB A44 VKE 12 (2004);

Client: Arge BOG-Roßla

Hochbuehl Tunnel, Germany

Installation and measurement of a distometer measuring section to monitor the deformations in the Hochbuehl tunnel, section 5634 Landshut – Eisenstein of the Deutsche Bahn (2012-15 and 2019-2020);

Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Hochheim, Germany

Observing control of a sliding slope with sliding deformaters in the area of retaining walls at the railway section 3603 Frankfurt – Wiesbaden (2004-17);

Client: GI-Consult

Hofheim, Germany

Installation of multiple extensometers for monitoring of the Elizabeth school in Hofheim (2002);

Client: Terrasond GmbH & Co. KG

Hofheim – Wallau, Germany

Inclinometer measurements for a dwelling house (2004-05);

Client: IfG Dr. Jochen Zirfas

Hohentwiel Tunnel, Germany

Installation of extensometers, highway Stuttgart - Lake of Constance, western part (1982);

Client: Autobahndirektion Stuttgart 1

**Immendingen, Germany**

Installation of sliding deformer measuring tubes in boreholes at the Daimler test ground (2014 and 2015);

Client: Arge Testgelände Immendingen (Terrasond, Drillexperts), Drillexperts

Iraq Expressway 1/6, Iraq

Prospecting drilling, vane testings, installation of piezometers and inclinometers in two proving grounds (1981);

Client: Joint Venture Bilfinger+Berger, Bauaktienges., Dyckerhoff & Widmann

Ittenbach Tunnel, Germany

Installation of multiple extensometers and of a pressure cell measuring section in the course of tunnelling works for the Ittenbach tunnel of the new railway line Koeln - Rhein/Main of the Deutsche Bahn (1999);

Client: Arge Mittelstand NBS Koeln-Rhein/Main, Los A Tunnelbau

Jaenschwalde, REA, Germany

Installation of extensometers as "settlement gauge" (1994);

Client: Geo Romberg GmbH

Jubach, Gravity Dam, Germany

Instrumentation of the dam during reconstruction works (1990);

Client: Dyckerhoff & Widmann, Düsseldorf

Juelich, Nuclear Research Plant, Germany

Installation and measurement of inclinometers in the SNG-area of the nuclear research plant Juelich (1984);

Client: Kernforschungsanlage Jülich GmbH

K 2300 near Garnberg, Germany

Execution of inclinometer measurements (2009-11);

Client: HPC

Kachlet Sluice, near Passau, Germany

Installation of extensometers and inclinometers (1982);

Client: Lehrstuhl für Felsmechanik, Universität Karlsruhe

Kammereck Rock, Germany

Installation of anchor load cells and extensometers with distant reading for control of the Kammereck Rock (1992);

Client: Stump Bohr GmbH, Langenfeld

Kappelesberg Tunnel, Germany

Installation of extensometers and convergence measuring sections for distometer for tunnel monitoring (1997);

Client: Menning GmbH

Karlsruhe, City Railway Tunnel, Germany

Installation of extensometers with electric displacement transducers (2014);

Client: Glötzl GmbH

**Kassel, Hercules Monument, Germany**

Installation of extensometers, inclinometers, settlement devices, groundwater measuring transmitters, hanging pendulum and automatic measuring and recording system (1982);

Client: Staatsbauamt Kassel

Katzenberg Tunnel, Germany

Insertion of boreholes with combined sliding deformer/inclinometer measuring tubes and with multiple extensometers in the course of investigation for the new construction of Katzenberg tunnel, new railway line Karlsruhe – Basel of the Deutsche Bahn. Setup of an automatic data acquisition at 8 combined sliding deformer / inclinometer measuring points with chain inclinometers and at 3 multiple extensometers with electric displacement transducers. Measurements before and during the excavation works (2001-13);

Client: Menning KG, geon GmbH

Katzenberg Tunnel, Germany

Maintenance and repair of several piezometer measuring points (2008-11);

Client: Drillexpert GmbH

Kaunertal, Exploration Imst – Haiming, Austria

Installation of electric pore water pressure transducers with data logger in a borehole 200 m deep, 15° falling from the horizontal line (2018);

Client: BG RoBla mbH

Kaunertal, Hydroelectric Power Station, Austria

Installation of electric pore water pressure transducers in exploratory drillings in the storage space Gepatsch. Data acquisition with electronic data loggers (2016);

Client: BG RoBla mbH

Kelsterbach, Germany

Inclinometer measurements at the slope Bergstrasse, Hoellenstrasse, Schoene Aussicht (2007-13 and 2021);

Client: GEO-TEC GmbH, Georingenieur Früchtenicht + Lehmann

Kempten, North Junction, Germany

Delivery of inclinometers, extensometers and electrical pore water pressure transducers for the instrumentation of the test dam (2012);

Client: geo Bohrtechnik GmbH

Kestert, Rock Support, Germany

Installation of 3-point extensometers with electric displacement transducers for rock monitoring above the railway section 3507 Wiesbaden – Nieder-lahnstein of the Deutsche Bahn (2006);

Client: Karl-Heinz Schneider Baugeschäft - Felssicherung

Kirchberg, Monastery, Germany

Inclinometer measurements for slope monitoring at the horse stable (2005-08 and 2014);

Client: Terrasond GmbH & Co. KG

Kirchheim, Overtake Railway Station, Germany

Delivery and installation of inclinometers and extensometers for stability control of the eastern slope, new railway line H/W Middle of the Deutsche Bundesbahn; execution and evaluation of the measuring programme (1986);

Client: Arge Bickhardt-Bau/Kirchner-Stutz

**Kladno Colliary, Czechia**

Consulting on the planning and installation of geotechnical measuring instruments in a firedamp shaft together with Stavební Geologie n. p., Praha (1987-90);

Client: Dul Slany k. p., Slany, Czechia

Koblenz, Rittersturz, Germany

Monitoring of boreholes with the acoustic borehole scanner ABF and with ETIBS[®], caliber measurement, Borehole deviation measurements and flowmeter(2013,2020);

Client: BOG GmbH

Koblenz, Stolzenfels Castle, Germany

Installation of Trivec measuring tubes (1994);

Client: Geo-Tec GmbH, Cochem

Konrad, Shaft, Germany

Installation of extensometers with electric displacement transducers and data loggers (2016-17);

Client: Glötzl GmbH

Kostenfels, Germany

Installation and measurement of an automatic control system of the Kostenfels blocks by means of electrical fissurometers. Control of the effect of explosive concussions during the Kostenfels tunnelling works (1994-);

Client: Straßenneubauamt Dahn - Bad Bergzabern

KTB Continental Deep Drilling Programme, Germany

Feasibility study for the installation of a "Deep-Earth-Observatory" in the test drilling of the continental deep drilling project (depth about 5000 m); prototype development of a primary stress and hydraulic monitoring station. Long-term measurements of interstitial pressure, primary stress, temperature, electrical conductivity etc. (1988-90);

Client: Projektleitung der Kontinentalen Tiefbohrung der BRD, im Auftrag des Bundesministerium für Forschung und Technologie, BMFT

Kuenzelsau, Handelshof, Germany

Installation of extensometers and delivery of anchor load cells to control the excavation support (1997);

Client: Stump Bohr GmbH, Ismaning

Laudenbach, Germany

Measurement of inclinometers at the landslide railway embankment Weikersheim / Laudenbach (2002);

Client: Menning KG

Laufenburg, Germany

Monitoring of the retaining wall support Laufenburg West with sliding micrometer and Trivec (2000-2001);

Client: DB Netz AG, Karlsruhe

Lehmen, Sluice, Germany

Execution of borehole jack tests with Ettliger dilatometer, monitoring of drillings with optic scanner system ETIBS[®], installation of pore water pressure transducers with el. data loggers (2009);

Client: Erkelenzer BG

**Leibis/Lichte, Barrage, Germany**

Instrumentation and measurement in the course of the extended exploratory excavation in the foundation area of the barrage with distometer, combined sliding micrometer - inclinometer measuring tubes and extensometers (1994-95);

Client: Thüringer Talsperrenverwaltung

Leinebusch, Endelskamp and Mackenrodt Tunnel, Germany

Installation of measuring cross sections and measuring points; geotechnical measurements and execution of the measurement, Leinebusch, Mackenrodt, and Endelskamp tunnel, new railway line H/W North of the Deutsche Bundesbahn, joint venture with Glötzl Baumesstechnik Company (1984-85);

Client: Arge Leinebusch-, Mackenrodt-, Endelskamptunnel

Leonberg, Parking Cavern, Germany

Installation of measuring cross sections, radial and tangential stress measurements, extensometer (1984);

Client: Dyckerhoff & Widmann, Niederlassung Stuttgart

Loerrach, Germany

Measurement of inclinometers for the enlargement of the vocational academy Loerrach (2002-04);

Client: Terrasond GmbH & Co. KG

Mainflingen, Toxic Waste Dump, Germany

Installation of inclinometers and inclinometer measurements in dams (1982);

Client: Hessische Industriemüll Betriebsgesellschaft mbH, Wiesbaden

Massada, Israel

Delivery of electric anchor load cells for control of continuously installed anchors at the pillars of the cable railway Massada (1998);

Client: Stump Bohr GmbH, Ismaning

Meiningen, Germany

Inclinometer measurements for control of the slope stability, motorway BAB A71 Erfurt - Schweinfurt (1996-98);

Client: Terrasond GmbH + Co. KG

Mengerskirchen, Pond, Germany

Installation and maintenance of a measuring set with el. water level transducers for level control in the zone of the pond (1993-99);

Client: Hessisches Forstamt Weilburg

Messel, Waste Dump, Germany

Installation and measurement of a pile measuring line by a distometer, inclinometer measurements for control of the slope stability of the mine Messel (1991-96);

Client: Kreisausschuss des Landkreises Darmstadt-Dieburg

Messstetten Tieringen, Germany

Inclinometer measurements (2016-17);

Client: drillexpert GmbH

**Michael Tunnel, Investigation Tunnel, Baden-Baden, Germany**

Installation of extensometers, measuring anchors, interstitial pressure transmitters and pressure pickups (1982);

Client: Tiefbauamt der Stadt Baden-Baden

Miehlen, Germany

Measurement of inclinometers at the barrage Hauserbachtal (2007-08, 2013, 2017, 2018-2020);

Client: GEO-TEC, IFG Zirfas

Moessingen, Cottage Colony, Germany

Inclinometer measurements to control the landslide Moessingen (2013-);

Client: Terrasond GmbH & Co. KG

Mottgers and Burgsinn, Overtake Railway Stations, Germany

Installation of control systems (extensometers, inclinometers, piezometers) in rock slopes along the new railway line H/W South of the Deutsche Bundesbahn (1982);

Client: Arge Anger's Söhne, Preussag AG

Muehlener Tunnel, Germany

Installation and measurement of convergence measuring sections with distometer, control of fissures by fissurometers (2016-19);

Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Muehlenkopf Tunnel, Germany

Planning, execution and evaluation of geotechnical measurements, new railway line H/W North of the Deutsche Bundesbahn (1983-1988);

Client: Arge Müндener Mühlenkopf-Tunnel

Muehlenkopf Tunnel, Germany

Long-term control, geotechnical measurements and geotechnical - rock mechanical expertise of the slope stability and possible effects on the stability of the tunnel, new railway line H/W North of the Deutsche Bundesbahn (1988-90);

Client: PrGr H/W Nord der Bahnbauzentrale, Bundesbahndirektion Hannover

Muellheim, Germany

Inclinometer measurements for supervising the landslide Reggenhag (2003-09);

Client: Town of Müllheim

Multifunctional Probe

Development and construction of a borehole TV-camera as a modular part of a multifunctional probe (1996);

Client: Glötlz GmbH

Muenden Tunnel, Germany

Planning, execution and evaluation of geotechnical measurements, new railway line H/W North of the Deutsche Bundesbahn (1983-89);

Client: Arge Müндener Mühlenkopf-Tunnel

**Muenster, Germany**

Inclinometer measurements in bored piles of the excavation support of the underground bike park (1998);

Client: Gollwitzer GmbH

Neckar Bank Tunnel Heidelberg, Germany

Execution of borehole jack tests with Ettlenger borehole jack and Ettlenger dilatometer. Insertion of boreholes to groundwater and pore water pressure measuring points with electrical data loggers (2008-09);

Client: Arge Neckarufertunnel (Eder GmbH, J. Menning KG)

Neckartailfingen, Germany

Inclinometer measurements at a lot in the Stuttgarter Street (2011, 2019 and 2020);

Client: Terrasond GmbH & Co. KG

Neuenberg Tunnel, Germany

Execution of geotechnical measurements, settlement gauge with electrical distant reading for open type region of the tunnel, new railway line M/S of the Deutsche Bundesbahn (1985-86);

Client: Arge Neuenbergtunnel, Bretten

New Railway Line Erfurt – Halle/Leipzig, Section 3, Germany

Execution and evaluation of borehole jack tests with flexible dilatometer, Stuttgarter borehole jack and pressuremeter according to Ménard. Instrumentation of boreholes with electrical interstitial pressure transducers and electronic data loggers (1993);

Client: Erkelenzer Bohrgesellschaft mbH

New Railway Line H/W North: Tunnel Objects, Germany

Long-term control and geotechnical measurements in the Escherberg, Eichenberg, Riesenberg, Hopfenberg, Wadenberg, Helleberg, Krieberg, Rauheberg, Muendener and Muehlenkopf tunnel. Geotechnical - rock mechanical expertise of the slope stability and possible effects on the stability of Muehlenburg tunnel (1990-92);

Client: PrGr H/W Nord der Bahnbauzentrale, Bundesbahndirektion Hannover

New Railway Line Koeln – Rhein/Main, PA 33, Germany

Installation of inclinometer measuring tubes; new railway line Koeln - Rhein/Main of the Deutsche Bahn (1995);

Client: Bohrgesellschaft Roßla

New Railway Line Stuttgart – Ulm, PFA 2.1, Weilheim, Germany

Delilvery and installation of combined sliding deformer / inclinometer mea-suring tubes (2015);

Client: Heinz Burkhardt GmbH & Co. KG

New Railway Lines, Tunnels, Germany

Long-term temperature measurements with measuring chains in the Muendener tunnel and in the Krieberg tunnel with temperature sensors in conjunction with el. data loggers to determine the parameters for the load factor temperature as to the contact line construction (1999-2002);

Client: DB Netz AG, Central Office Frankfurt

**Niederstetten Tunnel, Germany**

Installation of a convergence measuring section for distometer to observe the deformation characteristics of the tunnel (1998-2007);

Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Nittel Tunnel, Germany

Loggings of borehole running off and inclinometer measurements in the pre-cut of the Nittel tunnel, railway section 3010 Koblenz – Perl of the Deutsche Bahn (2006-09);

Client: Schützeichel GmbH & Co. KG

Nittendorf, Railway Bridge, Germany

Inclinometer measurements for control of the slope (1998-99);

Client: Geoalpha, Regensburg

Nollinger Berg Tunnel, Germany

Installation of a measuring section with multiple extensometers (1998);

Client: Arge Tunnel Nollinger Berg (Max Blgl GmbH, Walter Bau AG)

Nusplingen, Germany

Inclinometer measurements to control the landslide at the Hartsteige (2015-17 and 2019-2020);

Client: Drillexperts GmbH, Prof. Dr.-Ing. E.Vees und Partner

Oberrohrn, Subrosion Sink, Germany

Delivery and installation of a 3-point extensometer to measure the settlement up to 1.5 m (2016);

Client: BOG GmbH

Obsthofstollen, Pforzheim-Eutingen, Germany

Installation of extensometer measuring sections for strain measurements during tunnelling (1997-98);

Client: Schachtbau Nordhausen

Oestrich-Winkel, Germany

Measurement of inclinometers in the Hallgarten Street (2016-);

Client: Terrasond GmbH & Co. KG

Oehringen, Commercial Vocational School, Germany

Installation and measurement of inclinometers for control of soil compression and dumping works (1992);

Client: Behnisch & Partner, Stuttgart

Offenbach, Haus der Wirtschaft, Germany

Instrumentation of the combined pile - plate basement with pile butt cells, electric base pressure transmitters and electric interstitial pressure transducers (1997);

Client: Glötzl GmbH

Offenbach, Kaiserleikreisel, Germany

Installation and measurement of Trivec measuring tubes in the course of the reconstruction of the roundabout Kaiserlei (2017-19);

Client: BOG GmbH

**Peissenberg, Germany**

Monitoring of a 70 m long retaining wall with wire extensometers and alarm device at the railway line of the Deutsche Bahn Schongau – Peissenberg (2005-06);

Client: DB Netz AG

Perjen Tunnel, Austria

Execution of borehole jack tests with Ettliger dilatometer and Ettliger borehole jack, inclinometer measurements in exploratory drillings for the second tube of the Perjen tunnel S 16 Arlberg expressway (2012);

Client: Bohrgesellschaft Roßla mbH

Pforzheim, Kanzler Street, Germany

Inclinometer measurements (2011-);

Client: Schützeichel GmbH & Co. KG, Stadt Pforzheim

Pforzheimer Tunnel, Germany

Execution of borehole jack tests with Ettliger borehole jack and Ettliger dilatometer. Monitoring of exploratory drillings with a borehole camera. Installation of convergence measuring sections with distometer (2007-09);

Client: Schützeichel GmbH & Co. KG

Phillipsburg, Kernkraftwerk, Nuclear Power Station, Germany

Measurement of inclinometers at the Rhine dam, before and after the blasting of the cooling towers (2020);

Client: IBO Beratende Ingenieure PartG mbB

Pians, Alpine Road, Austria

Execution and evaluation of borehole jack tests with Ettliger dilatometer, installation and measurement of an inclinometer in the course of investigation of a sliding slope near Pians (1996);

Client: Preussag, Wien

Pirmasens, Waste Dump Gruenbuehl, Germany

Monitoring of the dump's support body at the valley side with inclinometers (2000-02);

Client: Arcadis Asal, Kaiserslautern

Pliezhausen, Germany

Measurement of inclinometers in the building area Baumsatz IV (2016);

Client: Terrasond GmbH & Co. KG, community of Pliezhausen

Quirnbach, Motorway Dam, Germany

Execution and evaluation of Trivec measurements for dam control (1998-2000);

Client: Glötzl GmbH

Rastatt, Tunnel, Germany

Installation of electrical interstitial pressure transducers with electronic data loggers (2019-2020);

Client: Arge Terrasond-Drillexpert

**Rauheberg Tunnel, Germany**

Installation of measuring cross sections and measuring points, geotechnical measurements and execution of the measurement, Rauheberg tunnel, new railway line H/W North of the Deutsche Bundesbahn, joint venture with Glöttzl Baumesstechnik Company (1984-87);
Client: Arge Rauhebergtunnel

Rauheberg Tunnel, Germany

Installation and operation of an alarm device with fissurometers and pressure sensors to control a damaged tunnel section until reconstruction will start (2011-);
Client: gbm – Ges. für Baugeologie und –messtechnik mbH, DB Netz AG

Rehberg Tunnel, Germany

Installation and measurement of sections for deformation measurements with distometer to control an old railway tunnel (2004-05);
Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Reichenbach Valley Bridge, Motorway BAB A 71, Germany

Instrumentation of combined pile - plate basement of the pillar axis 10 with pile strain transducers, base pressure transmitters, and interstitial pressure transducers; automatic measuring system with remote data transmission by radio modem (2000);
Client: GGB GmbH

Reichenstein Tunnel, Germany

Stress measurements according to the method of compensation, installation and measurement of extensometer- and distometer measuring sections in the course of the documentation (2001-10);
Client: gbm - Ges. für Baugeologie und -messtechnik mbH

Rheinfeld, Germany

Measurement of inclinometers for monitoring the mast no. 8551/100 of EnBW (2002-05);
Client: Dr. Ing. Orth GmbH

Rheinheim, Germany

Inclinometer measurements for slope stability control in the building area Bruckaecker (1995-2001);
Client: Planungsbüro Taberg

Rollenberg Tunnel, Germany

Control of the preliminary excavation; installation and measurement of extensometers and inclinometers at the western portal of Rollenberg tunnel, new railway line M/S of the Deutsche Bundesbahn (1984-86);
Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe

Rollenberg Tunnel, Pilot Tunnel, Germany

Installation of measuring cross sections and evaluation of geotechnical measurements and tests, new railway line M/S of the Deutsche Bundesbahn (1983-85);
Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe

Rottbitze Tunnel, Germany

Installation of multiple extensometers and pressure cell measuring sections in the course of tunnelling works for the Rottbitze tunnel of the new railway line Koeln - Rhein/Main of the Deutsche Bahn (1999);
Client: Arge Mittelstand NBS Koeln-Rhein/Main, Los A Tunnelbau

**Salt Lake, Germany**

Installation of electrical interstitial pressure transducers with electronic data loggers in the course of the re-dam up of the salt-lake (1996-97);

Client: IHU GmbH, Halle

Saubuckel Tunnel, Germany

Execution of the geotechnical measuring programme, control of the preliminary excavation with inclinometers, new railway line M/S of the Deutsche Bundesbahn (1986-88);

Client: PrGr M/S der Bahnbauzentrale, Bundesbahndirektion Karlsruhe

Schanz Tunnel, Germany

Shortening and re-lengthening of multiple glass fibre rod extensometers in the course of partial recovery of the bottom area, railway line Waiblingen - Schwaebisch Hall - Hesselental (1994 and 96);

Client: Bilfinger + Berger, Stuttgart

Schickeberg Tunnel, Germany

Execution of geotechnical measurements in the course of tunnelling, new railway line H/W Middle of the Deutsche Bundesbahn (1985-86);

Client: Arge Schickeberg Tunnel

Schlackenbergr, Waste Dump, Germany

Execution of borehole loggings in wells (2007);

Client: Arge Deponie Schlackenbergr

Schliengen Vineyard, Germany

Installation and measurement of combined sliding deformer / inclinometer tubes for PFA9.1 new railway line Karlsruhe – Basel (2008-14);

Client: Abt GmbH, geon GmbH

Schluechtern Railway Station, Germany

Measurement of boreholes with multifunctional probe, installation of multiple extensometers with electric displacement transducers and measuring automatic device with alarm (2009-);

Client: Schützeichel GmbH & Co. KG, DB Netz AG

Schuerzeberg Road Tunnel, Germany

Planning, execution and evaluation of geotechnical measurements in the Schuerzeberg tunnel; B 27 roundabout Oberrieden (1990-1992);

Client: Hess. Straßenbauamt, Eschwege

Schwandorf, Germany

Delivery and installation of multiple extensometers and inclinometers, delivery of hydraulic anchor load cells to control the stability of a slope (1995);

Client: Stump Bohr GmbH

Schwarzbach, Valley Bridge, Germany

Execution of measurements, delivery and installation of measuring sensors and instruments (load measurement, strain measurement with wire resistance strain gauge rods, extensometer and inclinometer measurements) in joint venture with Glötzl Baumesstechnik Company, valley bridge Schwarzbach of the new railway line H/W Middle of the Deutsche Bundesbahn (1983);

Client: Grund- und Pfahlbau GmbH, Frankfurt/M.

**Schwarzenbach Barrage, Germany**

Installation of pneumatic interstitial pressure transducers in upstream boreholes (1997);
 Client: *Badenwerk AG*

Schwarzkopf Tunnel, Germany

Long-term monitoring of deformations with distometer measuring sections (1999-2017);
 Client: *DB AG Planungsbüro Fahrbahn Süd, LGA Bautechnik GmbH*

Schweitenkirchen, Slope Slide, Germany

Execution of inclinometer measurements (1996-99);
 Client: *Geoalpha GmbH*

Seelenwald, Slope, Germany

Installation of chain inclinometers with data logger and presentation of the measuring results via internet server to control the slope Seelenwald DB railway section 4250 (2018-);
 Client: *BG Roßla mbH*

Shongtong Karcham HPP, India

Supervision of installation and measurements of inclinometers, interpretation of measuring results (2016-);
 Client: *KfW Bankengruppe*

Sibratsgfall, Austria

Insertion of boreholes to inclinometer- and interstitial pressure measuring points (2007);
 Client: *Reitberger GmbH*

Soesetal Earth Dam, Harz, Germany

Installation of piezometers for control of leakage water (1985);
 Client: *Harzwasserwerke des Landes Niedersachsen, Hildesheim*

Spitzeich Tunnel, Germany

Installation and measuring of convergence measuring sections with distometers as well as crack control for documentation of mining-related deformations (1999-2003);
 Client: *gbm – Ges. für Baugeologie und -messtechnik mbH*

Steinbach, Germany

Inclinometer measurements in the section Dannenfels – Steinbach of the county road L 394 (2004-05);
 Client: *GeolIngenieure Früchtenicht GmbH*

Stuttgart 21, 3. EKP, Lot 4, Germany

Installation of electrical interstitial pressure transducers with electronic data loggers in exploratory drillings, new railway line Stuttgart - Augsburg of the Deutsche Bahn (1996-98);

Client: *ARGE Stuttgart 21 (Waschek GmbH, Terrasond GmbH + Co. KG)*

**Stuttgart 21, 4. EKP, Lots 1-7, Germany**

Installation of electric interstitial pressure transducers with electronic data loggers in exploratory drillings, insertion of Trivec measuring tubes in a borehole, new railway line Stuttgart - Augsburg of the Deutsche Bahn (1997-99);

Client: Arge Stuttgart 21, 4. EKP and Hettmannsperger GmbH

Stuttgart 21, 5. EKP, Lots 1-7, Germany

Insertion of boreholes with Trivec measuring tubes and with combined sliding deformer/inclinometer measuring tubes, new railway line Stuttgart – Augsburg of the Deutsche Bahn (2002-03);

Client: Arge Stuttgart 21, 5. EKP

Stuttgart 21, Germany

Trivec-measurements and measurement of combined sliding deformer / inclinometer measuring tubes (2011-2020);

Client: DB ProjektBau

Stuttgart LBS, Germany

Measuring anchor holes with the SlimGyro system (2020);

Client: LBS Landesbausparkasse Südwest

Stuttgart 21, PFA 1.3b, Germany

Installation of pneumatic pore water pressure transducers in exploratory drillings (2016);

Client: drillexpert GmbH

Stuttgart, Bank and Administration Centre at the Central Station, Germany

Installation and measurement of control systems in the excavation safety device (anchor load cells, earth pressure transmitters) and in the bottom plate of the skyscraper (extensometers, base pressure transmitters), (1992-93);

Client: Baugrundinstitut Smoltczyk & Partner GmbH, Stuttgart

Stuttgart, Suburban Train Stuttgart Airport - Bernhausen, Germany

Execution of borehole jack tests with flexible dilatometer, primary stress measurements with the triaxial cell CSIRO, execution of air injection tests with online control of 13 levels with electrical pressure loggers and data recording unit (1995);

Client: Erkelenzer Bohrgesellschaft, Schützeichel GmbH & Co. KG

Stuttgart, Suburban Train Stuttgart Airport - Bernhausen, Germany

Installation of combined sliding deformer / inclinometer tubes, short extensometer and tilt sensors with automatic measuring system for monitoring of runway and landing strip during tunnelling (1997-98);

Client: Terrasond GmbH + Co. KG

Stuttgart, Umland School, Germany

Delivery and wiring of temperature measuring chains in geothermal boreholes (2014);

Client: MK-Bau GmbH

**Sulzbach Valley Bridge, Germany**

Installation and measurement of combined sliding deformeter / inclinometer measuring tubes and horizontal inclinometers during the construction of the Sulzbach valley bridge for die new railway line Stuttgart – Augsburg of the Deutsche Bahn (2012-15);
Client: Adam Hörnig GmbH & Co. KG

Sulzhof Tunnel, Germany

Installation of a measuring cross section, radial and tangential stress measurements along the new railway line H/W Middle of the Deutsche Bahn in joint venture with Glötzl Baumesstechnik Company (1983-84);
Client: Hochtief AG, Frankfurt/M.

Sylvenstein Reservoir, Germany

Installation of combined sliding micrometer - / inclinometer measuring tubes up to 108 m depth (2009);
Client: Stölben GmbH

Trier, Germany

Inclinometer measurements for the planned construction of Aldi Trier (2009-10);
Client: Schützeichel GmbH & Co. KG

Trier, 2nd Sluice of the Mosel, Germany

Execution of borehole jack tests with Ettliger borehole jack and Ettliger dilatometer. Insertion of boreholes to interstitial pressure measuring points with automatic data acquisition (2007);
Client: Erkelenzer BG

Tuellinger Tunnel, Pressure Measurements, Germany

Installation and measurement of four pressure cell measuring sections and eight strain measuring sections for distometer in the course of the redevelopment of the Tuellinger tunnel (1997-99, 2003, 2009, 2015);
Client: Arge Tüllinger Tunnel (Harsch, Beton- und Monierbau), DB Netz AG

Tuellinger Tunnel, Strain Measurements, Germany

Installation and measurement of convergence measuring cross sections with distometer, electro-optic convergence measurements, extensometer, fissurometer, automatic data recording of all electrical probes (1991-1997);
Client: BZA München und Bundesbahndirektion Karlsruhe

Unken, Roundabout, Austria

Consulting on the instrumentation of a pilot gallery in swelling rock (1989);
Client: Bautechnische Versuchs- und Forschungsanstalt, Salzburg, Austria

Vaihingen, Eastern Roundabout, Germany

Measurement of inclinometers for control of slope stability in the region of the planned tunnel portal (1993-97);
Client: Baugrundinstitut Smolczyk & Partner GmbH

Vallendar, Germany

Measurement of inclinometers in the "Obere Meerbach" Street (2009-13);
Client: Schützeichel GmbH & Co. KG

**Walchensee, Barrage, Germany**

Camera monitoring of exploratory drillings in the course of stability controls of the water castle dam, installation of packers with pneumatic foundation water pressure transducers (1998);

Client: Terrasond GmbH + Co. KG

Waldeck, Power Station, Germany

Borehole deviation measurements in exploratory drillings for the extension of the Power Station Waldeck 2 (2009-10);

Client: Arge PSW Waldeck (Terrasond, Schützeichel, BOG), Bohrgesellschaft Roßla

Waldkirch, Retaining Wall, Germany

Monitoring of the retaining wall support with sliding micrometers and Trivec (2002-03);

Client: DB Netz AG, Karlsruhe

Walhalla, Donaustauf, Germany

Instrumentation of the underground arches, the „hall of expectation“ and the big retaining wall with distometer measuring sections to determine temperature-related length changes or length changes by construction deformations (1997-2001);

Client: Ing.-Büro Harbauer, Regensburg

Wallau, Detour L3017, Germany

Delivery and installation of inclinometers and combined extenso-/inclinometer measuring stations (2001);

Client: Terrasond GmbH & Co. KG

Wambach, B 260, Germany

Execution of borehole jack tests with Ettliger dilatometer and Ettliger borehole jack, installation of multiple extensometers (1995);

Client: Waschek GmbH

Wattkopf Tunnel, Germany

Installation of measuring cross sections, radial and tangential stress measurements, extensometers and piezometers in the Wattkopf road tunnel near Ettlingen. Execution of stress release measurements (1989-1993);

Client: Arge Wattkopftunnel

Weil am Rhein, Germany

Inclinometer measurements for slope monitoring at the Loerrach Street (2002-03);

Client: Terrasond GmbH & Co. KG

Weiler Helical Tunnel, Germany

Installation and measurement of convergence cross sections with distometer (1996-);

Client: Stadt Blumberg

Weinheim, Germany

Inclinometer measurements at the factory Muellheimer Tal (Freudenberg) (2001);

Client: Erkelenzer Bohrgesellschaft

**Weinsberg Tunnel, Germany**

Installation and measurement of convergence measuring sections with distometer and sliding micrometer measuring tubes (2001);

Client: AVG Karlsruhe, Walter Bau AG

Wildberg Tunnel, Germany

Supply of pneumatic pore water pressure transducers, Execution and evaluation of borehole jack tests with Ettliger dilatometer, Monitoring of exploratory drillings with a borehole camera, with the optic scanner system ETIBS® and the acoustic ABF system, Stress measurements according to the compensation method (2020);

Client: Gerätebau Wiedtal Schützeichel GmbH & Co. KG

Wipperoda, Damp, Germany

Installation of temperature sensors with electric data logger at the slope sealing of the waste (1997-2001);

Client: ETG Wahlwinkel

Wirmsthal, Central Waste Dump, Germany

Installation of measuring instruments for control of a rock wall of the central waste dump Wirmsthal/Bavaria (1990);

Client: Grundbauinstitut Dr. Amann, Mühlthal

Worms, Germany

Installation and measurement of horizontal inclinometers for settlement control below a hall of VDL Logistics Worms (2004-05);

Client: Goldbeck Bau GmbH

Wuerzburg, Underwater Pipelines in the Main, Germany

Levelling measurement of the underwater pipelines in the Main near Dettelbach, Klingenberg and Veitshoechheim with hydrostatic levelling to prove the minimum cover (1999);

Client: Pipeline Engineering GmbH

Yedigöl & Aksu HPP, Turkey

Installation of 3fold extensometers with electric displacement transducers and of electric pore water pressure transducers overhead with copper packers. Exploratory drillings in the pressure tunnels for the power stations Yedigöl and Aksu (2010);

Client: Eren Jeoteknik

Zelgenberg Tunnel, Germany

Installation and measurement of a measuring section with distometers (2017-);

Client: Gerätebau Wiedtal Schützeichel GmbH & Co. KG