

**Curriculum Vitae**
GIUSEPPE SEMBENELLI**BIRTH:** 1958, Padova, Italy
NATIONALITY: Italian**PROFESSION:** Senior Geotechnical and Civil Engineer
EXPERIENCE: 23 years**EDUCATION:** Dott. Ing. 5 yrs Degree in Civil Engineering – Structures, University of Padua, Italy, 1983
Dynamic Laboratory & In-Situ Testing of Soils, ISMES, Bergamo (1986)
Stage on liquefaction (lab. activities), Geotechnical Eng. Inc. (USA 1987)
Course on Grouting, University of Florida, (USA 1993)**LANGUAGES:** Italian: mother tongue, English: good, French: fairly good**LICENSES:** Registered Professional Engineer with the Ordine degli Ingegneri della Provincia di Verona, Italy, N°1542**PROFILE:**

Since the beginning of his professional life, Giuseppe Sembenelli has been dealing with Soil and Rock Mechanics and Geotechnical Engineering, in connection with large projects, such as earth and rockfill dams, roads and highways, buildings or bridges. To date he was involved in 16 dam projects in Italy and abroad.

Within the above assignments, he covered analysis and design activities, for embankments, large foundations, slope stabilizations, reinforced soils, soil improvement, soil and rock grouting, deep excavations, waterproofing and dewatering, planning and analysis of geotechnical investigations, design, supervision and analysis of field measurements and testing (test embankments, instrumentation), as well as research activities of reinforced soil structures and rock slopes.

He was also involved in the structural design of foundations, retaining structures, tunnel linings, motorway overpasses, ancillary works of dams, such as bridges, valve-chambers inlet or outlet structures.

Giuseppe Sembenelli started his career in a prominent Soil Mechanics laboratory, where he was technical manager of extensive testing programs, such as that for the Stava Tailings Dam, after the disaster which took place in 1985, and that for the Trino Vercellese Power Plant. In this period, he developed also testing procedures within a Quality Assurance Programme of the Italian Power Company and research work.

He is author of several Technical Papers.



PROFESSIONAL EXPERIENCE

From **1986-today** SC-SEMBENELLI CONSULTING srl, Milan, Italy, incorporated from PIERO SEMBENELLI CONSULTANT, active since 1983.
(Senior Geotechnical and Civil Engineer)

From 2005 - today, Giuseppe Sembenelli has been assisting the Site of **Kerrada Dam (Algeria)**. He carried out the construction Design of diversion and approach tunnels, earthfill dam, intake tower and conduits under the embankment, Foundations and construction materials investigations.

From 2005 – 2006, Giuseppe Sembenelli has been part of a team of experts appointed for an analysis of aspects related to the access works, slope stabilization, aggregate plants, and planning of jobsite for **Tekeze Dam (Etiopia)**.

In the same period he has been involved in several geotechnical and structural assignments like: environmental rehabilitation and extraordinary maintenance works of **San Valentino Dam (Italy, 2005)**, **Val Noci Dam (Italy 2006)**.

Project updating and construction supervision for the widening from 6 to 8 lanes of **A4 Milan – Bergamo Motorway**. The jobsite area is completely open to traffic including the construction of 2 interchanges, 2 bridges (65 and 163 m long), 1 railway flyover (90 m span), 36 flyovers, 5 pedestrian crossings, 6 underpasses, 13 emergency exits, vegetated anti-noise barriers for an overall length of 30 km, landscaping works in many areas surrounding the motorway

In 2004, Giuseppe Sembenelli has been part of a team of experts appointed for an analysis of aspects related to the access works, slope stabilization, aggregate plants, and programme for **Jin Ping Hydropower Project, on the Yalong River, Szechuan, PRC**, for the **Ertan Hydropower Development Company** of Chengdu, PRC. The dam is double curvature concrete, with a height of 305 m. The above aspects are crucial for the Project, as the environment is unfavourable, with steep, high slopes which make difficult to move and to locate safely the required activities.

In the same year, Giuseppe Sembenelli has been assisting the Site of **Borde Seco Dam**, in **Venezuela**, during the construction of a **40 to 50 m deep, concrete diaphragm wall**, which will improve the waterproofing of the sandstone abutments.

Between **2003** and 2004, Giuseppe Sembenelli has been producing the final design for the foundations of the New **Bridge on the Adda River** and for the **Rivabella Viaduct** both near the city of **Lecco, Italy**. The New Bridge on Adda River is a cable stayed bridge with central span of 110 m and 2 side spans 55.5 m long. The soil conditions are very difficult as the profile is dominated by soft lacustrine sediments. In the same period Giuseppe Sembenelli has been involved in the final design of the widening works to 4+4 lanes of the **A4 Motorway from Milan to Bergamo, Italy**. The activities included the final design of **35 overpasses 45 to 54 m span**, the abutments and related foundations of a **90 m span Railway bridge**, and of the foundation of the **arch bridges on the Adda River** (80 central span) and the **Brembo River** (60 m span). He was also involved in the seismic analysis of the overpasses.



Between **2002** and **2003**, Giuseppe Sembenelli has been part as Geotechnical Expert of 2 auditing teams, in association with Scott-Wilson, UK, within the works for the construction of the lines for the **Treno Alta Velocità, the Italian High Speed Train, TAV, Italy**. More in detail the teams were appointed for the analysis of **0.5 billions Euro Claims** along the **Milan to Bologna Line** and for the creation of a data base for **bench marking the costs** of future lines. In the same period, Giuseppe Sembenelli was involved in several dam, geotechnical and structural assignments, such as the **Stability Analysis of S. Valentino Dam, Italy**, the preliminary design of yards and foundations for the **Train to Truck Interchange Yard of Isola della Scala, Verona, Italy**, and the design of the abutments and foundation of a **railway overpass near Reggiolo Rolo (MO), for the Brenner Motorway**.

Between **2001** and **2005** Giuseppe Sembenelli has been assisting ASTALDI during the works of the **SS 18 Highway Futani-Centola, Cilento (Italia)**, providing construction design and assistance during construction for the **shaft foundations of 5 viaducts** 200 to 750 m long, with 55 piers up to 70 m high, **3 reinforced soil structures** up to 12 m high, **several anchored pile walls** and a **tunnel** some 200 m long. Within the same project, Giuseppe Sembenelli was also involved in the analysis and design of **stabilisation works for a large pre-existing slide** along the route.

In **2001**, he was involved in geotechnical and structural design for the abutments of 2 motorway overpasses (57 m span) for the **SP 119 Bis and SP 46 Roads, near Milan, Italy**. In the same period he assessed the stability of an underwater slope for the **Garda lake Sewer Line at Assenza, Italy**. He also designed the **shafts for the foundations of 2 bridges on Fatalà and Tibolà rivers, Guinea Conakry**. As member of an Anglo-Italian team, in joint venture with Scott-Wilson Railways, he worked as expert in geotechnics for the auditing of Contractor's claims on **the High Speed Train Line Torino - Novara, Italy**.

Between **1999** and **2000** Giuseppe Sembenelli has been involved in the design activities for the **Brescia METROBUS, Italy**, a Light Transport System some 32 km long, which crosses the city of Brescia and extends over the Val Trompia nearby (15 km of line with 13 stations, partly underground). The line is partly underground and partly on bridges. The central underground section underpasses the sensitive architectural environment of Brescia downtown. As a result of the above activities, requested under two different assignments, two tender designs were produced for a 'Design and Build' contract.

In the same period, he has been part of an Anglo-Italian team, expression of a joint venture with Scott-Wilson Railway, Swindon UK, in charge of auditing three different aspects of **the Treno Alta Velocità Project (High Speed Train), Roma, Italy**. The audits involved contractual and technical issues, related to the design of the overall scheme and to claims for an overall amount of 1.5 billion US\$.

In **2000** Giuseppe Sembenelli was also involved in the design of the excavations for the **Kalayaan Spillway, Philippines**.

In **1999**, Giuseppe Sembenelli has been dealing with the design and site assistance for the cofferdam at **Rendina Dam, Lavello (PZ), Italy**. The rehabilitation works of this 50 years old dam



required the preliminary construction of a cofferdam, in presence of a 5 m thick bed of extremely soft sediments of the reservoir.

In **1997 and 1998**, Giuseppe Sembenelli was involved in the consulting activities and site assistance for the **Ghazi-Barota Hydropower Project, on the Indus River**, in Pakistan. The Project includes a 3.5 km long barrage, with concrete spillway, head regulator and undersluices, and a 50 km long power channel. The area of the channel cross section is about 1000 m². The activities included the analysis and design for part of the cofferdams, for a jet-grouted curtain, for the dewatering and excavation works and for the foundations of 47 bridges and flumes located along the channel.

He was also involved in the activities for the Contract Design of the **Rehabilitation Works of S. Valentino Dam, Bolzano, Italy**, after the analyses carried out in 1994. As complementary activity, a FEM analysis was carried out to determine the stress and deformation field of the embankment in 2-D and 3-D conditions.

In the field of soil reinforcing, he designed the **protection works from rockfall** along the **SP11 Road at Preabocco, Verona, Italy**. The works consist of a 150 m long structure, formed by 5 m high reinforced concrete wall, overlain by a 6 m high reinforced soil block. He also produced the preliminary design of the **Planey High Reinforced Soil Structure, Courmayeur, Italy**, which provides disposal for some 300 000 m³ of tunnel muck.

In the same period, Giuseppe Sembenelli provided specialised geotechnical expertise and stability analyses for the **closure system** of the **Gerenzano Urban Waste Disposal, Milan, Italy**.

Between **1996 and 1997**, he dealt with the final design and site supervision of several works within the construction of Lot 2 of the **Monte Bianco-Aosta Motorway, near Courmayeur (AO), Italy**. The works included several anchored walls, either micropiled or jetgrouted, retaining deep excavations in moraine, piled foundations and analysis of reinforced soil structures. Analysis and recommendations for the stabilisation of a very steep slope, located within the project area, were also provided.

In the same years, he participated to the design and site assistance for the rehabilitation and the widening works of the **Ajiwa Dam, in Katsina State, Nigeria** (15 m high and 1800 m long). The works consisted of raising the dam by about 2 m, extending the embankment by about 900 m and building a new spillway for a design flood of 1800 m³/s. The works were completed before summer 1997.

In 1996, Giuseppe Sembenelli took part to the detailed design of **Castellaccio Tunnel, Arezzo, Italy**. This tunnel was excavated with shielded TBM and lined at the front with precast concrete segments. He assisted also the construction of the tunnel in a faulted area **Val d'Ultimo Italy**. He took part to the design and assistance to the works of **reinforced soil structures** of the coal conveyor feeding the **Thermal Power-Plant of Brindisi Sud, Italy**.

In **1995**, he has been member of the Safety Review Panel for the **Changma Dam, Gansu Province (P. R. of China)**. This dam was 56 m. high and 130 m long.



In the same year, he designed and provided assistance during the construction of a reinforced concrete caisson and of adjacent foundations for the **Bradi new Industrial Installation, Dalmine (BG), Italy**. The caisson had to contain an automated store which applied loads in the order of 200 kPa and was formed by a mat foundation some 1600 m² and by perimetral walls 8 m high. The foundation was set 10 m below the average ground level.

In **1994**, he was involved in the analysis of behaviour and design proposals of remedial works for **S. Valentino Dam, in Val Venosta (BZ), Italy** based on investigations and a 45 years monitoring records. He was also in charge of analysis and site assistance of an excavation on soft organic soils within **Fiumicino Airport, Roma, Italy**.

Since **1993 and 1995**, he made the analysis and design of the **two earth and rockfill cofferdam for the Ertan Dam, in P.R. of China**. The 2 cofferdams are 170 e 260 m, long and 32 e 65 m. high with a total volume of 3 millions m³, part of which has been dumped underwater. The activities included site assistance during construction, in 1994 and 1995.

In parallel he was also involved in the analysis and design of the foundation over swampy ground and related excavation for a heavy concrete structure connecting the **Brindisi North and Brindisi South Power Plants in South Italy**. The structure houses a service road, a pipeline, conveyor belts and other facilities.

In **1993**, Giuseppe Sembenelli designed the **Verrand High Reinforced Soil Structure in Italy**, located along the **Aosta - Mount Blanc motorway**. The embankment (150 m long, 37 m. high and with a slope angles of 60° over the horizontal) is reinforced with non-woven polyester geotextiles. He was also in charge for design and analysis of the **Piano del Campo Dam, South Italy** and took part in the design of the foundations for the **Milan South Motorway, Toll Station** and ancillary structures.

In **1992**, he was involved in the analysis and design of a rock slope, in order to prevent from rock fall the underlying powerhouse, at **Casuzze Plant in Southern Italy**. He also provided analysis and design of reinforced soil structures, up to 14 m high, along **the Strada Statale 51 di Alemagna**, an important road in North of Italy.

In **1990-1991**, he was involved in the analysis of some problems raised at **Cannamasca Dam, South Italy**, in connection with the excavations in stiff clay, carrying out the Upgrading of the Project. Since **1990**, he dealt with the geotechnical investigations on construction materials and on foundation soils and with the analysis and the design of the **Esna Earth Dam, on the Nile River in Egypt**, within the works the New Esna Barrage. He also supervised the site investigation and developed suitable procedures to check the quality of the fill dumped in water.

In the same years, he was involved in the design and analysis of the **Val Ferrua Embankment in Italy**, within the works for widening the Torino-Savona Highway. The Project was comprehensive of a reinforced soil embankment, a reinforced concrete wall up to 11 m high, and a reinforced concrete culvert.



Since **1989**, he started dealing with reinforced soil structures, mainly in connection with highways and roads embankments. He was involved in the analysis and design, in the monitoring activities and in the analysis of the behaviour of the **Champagne High Reinforced Soil Structure, in Italy**, with a reinforced soil slope up to 24 m high and 60° to 70° steep on the horizontal. He was charged to develop special techniques, based on strain gauges applications for the measurement of local strains, within the reinforced soil mass.

Between **1987 and 1989** he was mainly involved in the Project of Jibiya **Dam in Nigeria** (21 m high and some 3500 m long) with emphasis on the planning and analysis of the geotechnical investigations. The development of the Technical Specifications, the analysis of the dam and ancillary structures, the field supervision of instrumentation and, more recently, the analysis of the dam behaviour after the second and the fourth impounding cycles of the reservoir were the main tasks.

In **1987** he was involved in the activities for the **Alento Dam in Italy**, with the supervision of the tests embankment, comprehensive of two large permeameters built within the body of the cofferdam, with the analysis of relevant results, and the analysis and design of structural and geotechnical details. He also dealt with the planning of additional investigation and with the analysis of the results for the acceleration of construction of the **Mape Dam in Cameroon**.

1984 - 1986: ISMES-BERGAMO, Italy (geotechnical engineer)

In **1985 and 1986** he was the technical manager of important investigation programs, like that on **Stava tailings in Northern Italy**, after the collapse which took place on 19th July 1985, and those on the construction materials and on foundation soils for the construction phase of the **Trino Vercellese Nuclear Power Plant in Italy**.

In **1984**, he was responsible of developing **Technical Procedures of most laboratory tests, within the Quality Assurance Programme**, required by the Italian Electric Power Company (ENEL) for the construction of nuclear power plants. He was also in charge of setting up and developing **special tests, like dispersivity and flow pump permeability tests** and of one large application of strain gauges on the geotechnical centrifuge.

1983: ISMES - BERGAMO, Italy

As research assistant he was responsible of carrying out and analysing Cyclic and Dynamic Tests on Sands.



LIST OF PAPERS

- **Deformations and Factor of Safety in High Reinforced Soil Structures** – Discussion Session 4a, XI ECSMFE, Firenze, Italy, 1991
 - **Impiego del terreno in grandi strutture autostradali** – (with L. Gambardella, P. Dalmaso and A. Chiari), Quarry and Construction, n. 10, 1991
 - **Assestimetro Idrostatico orizzontale, Technical Note** – (with R. Lamperti), Rivista Italiana di Geotecnica, vol. XXVI, n. 2, 1992.
 - **Prove di permeabilità a portata controllata, Technical Note** – (with G. Angeloni), Rivista Italiana di Geotecnica, vol. XXVI, n. 3, 1992.
 - **Una procedura per il controllo del danneggiamento meccanico di un geotessile per rinforzo Technical Note** – Rivista Italiana di Geotecnica, vol. XXVII, n. 3, 1993
 - **Geosynthetics at New Esna Earth Dam** – (with P. Sembenelli) - Proc. V Int. Conf. on Geotextiles, Geomembranes and Related Products, Singapore, sep 1994
 - **Experiences from High Reinforced-Soil Structures** – Proc. V Int. Conf. on Geotextiles, Geomembranes and Related Products, Singapore, sep 1994 (with P. Sembenelli)
 - **Impiego di Geosintetici nella Costruzione della Diga di New Esna sul Nilo (Egitto)** – (with P. Sembenelli) - VIII Convegno ANIAI sui Geosintetici nelle Costruzioni di Terra, Bologna ott 1994
 - **An Approach to High Reinforced Soil Structure** – (with P. Sembenelli) - Symposium on The Practice of Soil Reinforcing in Europe, London may 1995
 - **Internal Erosion Around Relief Weels in Fine Sand** – (with P. Sembenelli, A. Ruffini) - Commission Internationale des Grands Barrages, Q.73 R.42, ICOLD, Firenze, 1997
 - **Geosynthetic System for the Facing of Bovilla Dam** –(with A.M. Scuero, P. Sembenelli) - Sixth International Conference on Geosynthetics, Atlanta, Georgia, USA March 1998
 - **The Verrand High reinforced soil structure** – (with P. Sembenelli) - Sixth International Conference on Geosynthetics, Atlanta, Georgia, USA March 1998
 - **Deep jet-grouted cut-offs in riverine alluvia for Ertan Cofferdams** – (with P. Sembenelli), Jrn. of Geotechnical and Geoenvironmental Engineering Division, ASCE, Vol. 125, n. 2, Feb. 1999.
 - **I muri vegetati Evergreen – Caratteristiche e Prove di comportamento** (with P. Sembenelli, F. Domanico), Quarry and Construction, n° 2, February 2001.
 - **Metrobus - La Metropolitana leggera automatica di Brescia – parte 1a Approccio progettuale e tracciato** – (with P. Sembenelli, G. Schiffer, M. Rainieri, A. Molinari), Quarry and Construction, n° 3, March 2001.
 - **Metrobus - La Metropolitana leggera automatica di Brescia – parte 2a Opere Civili** – (with P. Sembenelli, G. Schiffer, M. Rainieri, A. Molinari), Quarry and Construction, n° 4, April 2001.
 - **Displacement monitoring at Verrand High Reinforced Soil Structure** (with P. Sembenelli) in *Reinforced Soil Engineering – Advances in Research and Practice*, Ed. by H. Ling, D. Leshchinsky and F. Tatsuoka, Published by MARCEL DEKKER Inc., 2003
 - **Polymeric geomembranes and geotextiles in earth and rock dam to improve performance in unfavourable conditions and to reduce time and costs of construction** – (with G. Sembenelli) – Commission Internationale des grandes Barrages – 22eme Congrès – Barcelona, 2006
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- **Pantallas continuas en Concreto cortadas con Hidrofresa** - Congreso Panamericano Mec-Suelos, Venezuela, 2007 (con C.Biserna, R.E.Luna).
 - **Sistemi di intercettazione profonda per le dighe** – II Convegno: Problemi strutturali nell'ingegneria delle dighe. Accademia Nazionale dei Lincei, Roma 12-13 Aprile 2007
 - **Sistemi di Intercettazione profonda per le Dighe – Cut-offs for Dams** - (with P. Sembenelli), L'Acqua – Riv. Bimestrale dell'Associazione Idrotecnica Italiana -6/2007 – Novembre/Dicembre
 - **Foundation Piping and Syphoning under an Earth Embankment** – (with P.Sembenelli) – LTESBD08 – Nanjing 31 Maggio – 2 Giugno 2008.
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