



SSF Ingenieure

**Everything starts with dialogue**

# Development

1971	Foundation of Schmitt & Stumpf GbR
1988	Wolfgang Frühauf joins as the third partner
1990	Foundation of Schmitt Stumpf Frühauf and Partner GmbH
1991	Establishment of offices in Berlin and Halle
1998	Stake in the engineering firm Wagner + Partner, Munich
1999	Stake in the company Europrojekt Gdańsk S.A., Poland
2004	Stake in the company PEC + S Planning, Engineering, Consulting + Services GmbH, Munich
2004	Stake in the company PEC + S Beijing Planning, Engineering, Consulting + Services Ltd., Beijing, China
2005	Stake in the company Baugeologisches Büro Bauer GmbH, Munich
2006	Establishment of Cologne office
2006	Stake in the company S.C. SSF – RO s.r.l., Timisoara, Romania
2008	Company renamed SSF Ingenieure GmbH, Management Board Expanded
2009	Renaming of Wagner + Partner to Wagner Ingenieure GmbH, Munich Management board expanded
2009	Stake in the company Prof. Schaller UmweltConsult GmbH, Munich
2010	Transformation of the company into SSF Ingenieure AG
2012	Move to our new premises at Domagkstraße in Munich
2013	Inauguration of SSF do Brasil Ltda. in Sao Paulo, Brazil
2016	Change of site in NRW from Cologne to Düsseldorf



SSF Ingenieure

**Everything starts with dialogue**

# Locations



## We provide

comprehensive consulting and planning services

Administrative buildings, airports, ballast-less track, bottom-up construction, bridges, buildings, canals, clean room buildings, commercial construction, commercial property, cut-and-cover tunnels, deep basements, ecological construction supervision, ecological monitoring, ecological reports, engineering work, environmental planning, excavations, ground water tanks, halls, hangars, harbours, high-speed railway lines, hydroelectric power plants, industrial buildings, industrial facilities, laboratory buildings, landscape planning, magnetic suspension rail systems, mass suspension systems, motorway parking and toilet areas, motorways, motorway service areas, multi-storey car parks, noise protection enclosures, noise protection walls, offshore wind turbines, power stations, public utility structures, railway construction, railroad stations, residential buildings, roads, special-purpose excavation, suburban railways, top-down construction, towers, traffic interchanges, transmitter masts, transport terminals, tunnel drilling, undercuts, underground car parks, underground railways, underground rail stations, underpinning, water engineering construction

Accessibility analyses, advance planning, aero elastic stability calculation, area development plans, assessment of claims in course of construction, assessment of current state, authorisation to submit building documents, auxiliary construction planning, best practice on site, bills of quantities, build ability analysis, building controlling, building information modeling, building optimisation, building physics verifications, building planning, building samplings, building logistics planning, building sequence planning, building site investigation and consulting, building supervision, business foundation consulting, cartography, certifications, certification digital elevation model, clear structuring of structural details, claim management, climate protection concepts, compensation measures, comprehensive dynamic calculations, concept development, conflict analyses, conservation and development plans, constant optimisation of constructional elements in view of economic efficiency, construction efficiency, construction technique development, contract management, coordination planning, cost analysis/benefit, coordination with public authorities, cost controlling, cost management, detail planning, discharge calculations, document management, documents for land development and plan approval procedures, draft design, due diligence, durability, dynamics, ecological cartography, energy-efficient constructions, energy-efficient design, environmental assessment, environmental geotechnical examinations and assessments, environmental impact assessment, environmental licences, environmental monitoring and reporting, expert opinions, expert reports, facility management, feasibility studies, force flow oriented form and material selection, freeze stabilization, general planning, documents for planning approval procedures, system specifications, Geographical Information Systems (GIS), geological cartography, Geotechnical Interpretative Reports (GIR), geotechnical verifications, green area planning, greenhouse emissions analyses, groundwater modelling, groundwater systems, hydrological, idea drafts, investigation and planning, implementation of quality assurance measures, independent engineering, installation planning, interdisciplinary dialogue, interface management, inventory control, investigatory concepts, invitation to bid management, land use planning, landscape architecture, landscape conservation plans, landscape development, landscape planning, life cycle assessment, life cycle costs, location assessment, material usage concepts, master planning, mechanical fracture analysis and verification of fatigue, mitigation of environmental impacts, cost/schedule risks, multi-channel measurement record certification, nature protection, noise emission calculations, noise protection analysis and design, nonlinear geotechnical FEM analysis, on-shore and off-shore wind power towers, open space concepts, open space plans, operating concepts, optimised user functionality and flexibility, outline concepts, overhead cable on and off-switch during construction, phytosociological cartography, planning of building traffic, planning coordination, project development, project management, project steering, public relations, regional planning, renaturalisation, renovation planning, repair planning, requirements analysis, research and development projects, revitalisation concept, risk analysis and assessment, robustness, room acoustics, safety and health coordination, scheduling, seismic calculations, service specifications, serviceability, site analyses for photovoltaics, site analyses for wind farms, site management, site supervision in civil engineering for road and rail, settlement structure analyses, soil reuse and disposal concepts, space utilisation planning, structural analysis, space resistance planning, route planning, special excavation planning, species protection, stability analyses, stability analysis and planning of embankments, dams and cliff overhangs, stability calculations and tests at international level, status capture, street grid modelling, structural analysis, structural engineering, structural examination, structural optimisations, structural physics certificates, successful integration into the surroundings, sustainability planning, surveys, technical equipment, tender assessment, tender documents, traffic analysis, traffic prognoses, traffic impact studies, transportation studies, tunnelling simulation, urban structural concepts, use of adequate materials and material combinations, user and functional logistics, utility and management, urban development, use-withdrawal concept, value appraisal, value engineering, viability analysis and rating, vibration analysis, vibration calculations, water resources monitoring, wildlife conservation analyses, works planning, zoological cartography

## Contents

### About us

SSF Ingenieure .....	07
History .....	08
Holistic design and consulting .....	10
People .....	12
More than 40 years SSF .....	15
International markets .....	16
Quality assurance .....	18

### Services

Structural engineering .....	23
Geotechnical engineering .....	25
Building .....	26
Bridges .....	29
Tunnels .....	30
Construction Management .....	33
Noise protection .....	34
Landscape and environment planning .....	37
Railway construction .....	38
Roads .....	40
Research and Development .....	43
Remedial engineering .....	44
Structural analysis .....	47
PPP / BOT projects .....	48

### Contact

Offices .....	52
SSF Group .....	54
Memberships .....	56
Fast Facts .....	59
Imprint .....	60

Core competences of SSF Ingenieur have evolved in the last 40 years from pure structural planning of bridges to project planning for road and railway infrastructure and buildings to general planning of complex projects. This evolution and the alliance with the members of SSF Group allow us today to respond integrally and simultaneously in a non-sectoral way to very particular questions from the areas of environment and ecology or energy efficiency and sustainability in the context of responsible designs.

About us

---

*"We know that we will be judged by how we perform, and not by how we claim to perform. Thus, in all our efforts we continually focus on the needs of our customers."*

## SSF Ingenieure

### First choice for realising your projects

SSF Ingenieure is one of Germany's leading companies in the construction engineering and soil engineering sector. For more than 40 years we have been designing bridges and tunnels, and developing high-performance motorway and railway solutions. We plan railway and underground stations and develop complex industrial structures as well as building structures. We operate on a world-wide level.

Maximum quality, economy and sustainability are the touchstones of all our actions. We constantly monitor all parameters that affect construction planning and execution. You can depend on us to act in your best interests and we strive constantly to reduce all risks that affect execution, costs or timetables.

We realise the projects entrusted to us by focusing tightly on our customers' individual needs. Whether you are planning small-scale building projects or large-scale and complex infrastructure projects: With SSF Ingenieure you will have the support of a competent and reliable partner on your side. We implement your project with maximum quality, reliability and integrity.

Together with our innovative partners from the construction industry, academia and the software sector, we develop methods that enable us to control all processes, from the planning to the fabrication of individual components, and even entire structures, directly from the computer. This technology enables all parties involved in the construction process to work on and monitor a digital model of the project. This saves time and money. Using this technology, the virtual structure becomes a "five-dimensional" project that can be controlled efficiently.

*"As engineers we are committed to finding form and design. Materials from the past and the future, we use steel and concrete in an economic, ecologic and creative way."*

#### BMW Welt, Munich

BMW AG promotional and distribution centre

Architects: COOP HIMMELB(L)AU Wolf D. Prix / W. Dreibholz & Partner ZT GmbH

Site area: 25,000 m<sup>2</sup>

Usable space: 67,400 m<sup>2</sup>

Gross floor area: 73,000 m<sup>2</sup>

Gross volume: 531,000 m<sup>3</sup>

SSF: final design structures and object, overall construction management and supervision

## History

### From bridge specialist to structural generalist

In 1971, graduate engineers Victor Schmitt and Dieter Stumpf founded the consulting firm Ingenieurbüro Schmitt&Stumpf, the "core" of today's enterprise. In 1988 Wolfgang Frühauf, another engineer, joined the company as a partner, and the firm became Schmit Stumpf Frühauf and Partner. Before joining SSF, Wolfgang Frühauf had been managing director of the Munich office of a large German civil engineering company.

Since then, our company has steadily expanded on the basis of our successful activities and competences in structural civil engineering. Following German reunification, new regional offices were opened, and additional services were included in the performance spectrum. Today the SSF Group\*, together with its cooperating partners, can provide every planning and consulting service associated with building. In 2008 the management board was expanded to include the engineers Christian Schmitt and Helmut Wolf. At the same time, the legal name changed to SSF Ingenieure GmbH.

In 2010, SSF Ingenieure GmbH transformed into SSF Ingenieure AG. At the same time Victor Schmitt, Dieter Stumpf and Wolfgang Frühauf withdrew from the management and changed to the supervisory board. Christian Schmitt and Helmut Wolf will henceforth assume the management of SSF Ingenieure AG. In January 2011 Dipl. Ing. Anton Braun was appointed to the management.

---

**Bridge over the Ziegelgraben  
Second bridge over Strelasund,  
B 96n slip road Stralsund/Rügen**

---

Cable stay bridge across the Ziegelgraben as part of the 2,8 km-long bridge span.

**Overall length:** 583 m

**Main opening:** 198 m

**Pylon height:** 46 m

**Height of pylon over roadway:** 87 m

**SSF:** final design structures  
Construction award Mecklenburg-Western Pomerania 2008 (Special Award)

---

\* SSF Group members and affiliations see page 54 and 55 of this brochure.



# Holistic design and consulting

Design our built-up environment in a future-efficient way

“Sustainable development aims at the improvement of well-being, which, by contrast to the model of unlimited growth, respects the preservation of viability of natural bases of life.” (Objectives for sustainable development, Munich 2005)

“Sustainability” has become a key word in the political discussions – out of realisation that the current way of life and economy cannot guarantee the well-being of humans on a long-term basis and even influences it significantly in a negative way.

To design a society, a city, a region or the fabrication of a product or construction “sustainably”, a holistic consideration is needed in line with private sector and economy aspects as well as ethical, socio-cultural and ecological values.

We as architects and engineers understand it as our social task to implement the projects our clients entrust to us with much confidence as long-term functioning structures not only under aspects of design, technology, function and economy. Moreover, we want them to fulfil – with regard to future repercussions – demands of ecological restrictions and of socio-cultural evaluation criteria. We take the challenge on to ensure and design a viable and liveable environment for present and future generations.

As sustainable and socially responsible companies of the SSF Group, we identify ourselves with the principles of corporate responsibility and orientate ourselves voluntarily to the new ISO standard 26000 of Social Responsibility.

---

ZAE – Energy Efficiency Centre,  
Würzburg

---

The research building “Energy Efficiency Centre” of the Centre for Applied Energy Research (ZAE) uses innovative, prototypical and efficient construction materials, systems and technologies in order to verify by means of example their application in the sense of resource-friendly construction methods within the building stock as well as for new buildings, to demonstrate them and to subject them to monitoring.

Architect: Lang Hugger Rampp GmbH  
Architekten (LHR)

SSF: Project management and final design  
structures together with architects LHR

---



## People

### The key to success

#### Staff

SSF Ingenieure employs a highly qualified team of some 230 engineers, architects, ICT specialists, business administrators and economists. They are among the best in their particular discipline, and are our most important and valuable asset. The skills, commitment, personal dedication and creativity of every one of them form the foundation for collective success. They guarantee that SSF can master all challenges, now and in the future. That is why we promote the development of our staff and create an atmosphere of mutual trust as a basis for team spirit and the sharing of knowledge and expertise.

*“Our employs are among the best in their particular discipline, and are our most important and valuable asset.”*

#### Openness to dialogue

To optimise projects in their entirety, SSF brings to bear its wide-spanning knowledge and long years of experience in construction engineering and geotechnical engineering by engaging in an intensive interdisciplinary dialogue. That particularly includes working with our clients on a partnership basis.

#### Our integrity

We know that we will be judged by how we perform, and not by how we claim to perform. SSF realises its responsibility to its clients and all business partners, and is always mindful of the resulting obligations. We pursue our business activities within the framework of honest partnerships, and from an independent position that is beyond improper influence. The staff and management of SSF Ingenieure have committed themselves to this code of conduct and adhere firmly to it.

#### Our mission

We strive to offer our customers efficient, tailor-made to the individual needs and sustainable solutions that meet the demands for ever more sophisticated and complex infrastructure systems. Our aim is to continually improve our work and contribute alternative, more refined or entirely new ideas. In this way, we create real added value for our customers.

# 260 Employees

### Supervisory board



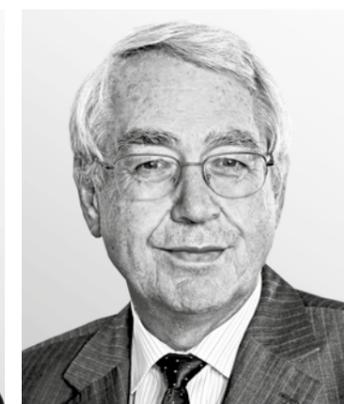
Victor Schmitt (Chairman)

Born 1938  
Dipl.-Ing., TU Munich  
Company founder 1971



Dieter Stumpf

Born 1943  
Dipl.-Ing., TU Munich  
Company founder 1971



Wolfgang Frühauf

Born 1943  
Dipl.-Ing., TU Munich  
Joined company in 1988

### Management board



Christian Schmitt (Chairman)

Born 1966  
Dipl.-Ing., TU Munich  
Joined company in 1996



Anton Braun

Born 1966  
Dipl.-Ing., TU Munich  
Joined company in 1992



Helmut Wolf

Born 1962  
Dipl.-Ing., FH Munich  
Joined company in 1988

*“No construction project disposes of only a one or two-dimensional inner life. A logical design always respects the complexity of things. Our construction projects are always multi-dimensional. All of this has to be present already in the first thoughts towards finding a solution for a construction project.*”

Maintenance hangar 1, Munich Airport  
for Deutsche Lufthansa AG

Length: 85 m  
Width: 305 m  
Height: 33 m  
Gross volume: 840,000 m<sup>3</sup>  
Overall height (pylon): 55 m  
SSF: general planning



## More than 40 years SSF

Civil engineering in figures

<b>Projects handled</b>	<b>14,100</b>
Roads	8,400
Railways	4,980
Bridges	8,500
Buildings	720

<b>Road kilometres</b>	<b>3,300</b>
Motorway	1,450
Motorway interchanges	107
Services / parking and toilet areas	60

# International Markets

## Design and Construction in a global Network

Foreign countries, different (construction) cultures, different traditions and certain standards always present a new challenge for the international project management at SSF Ingenieure. Our successful international projects clearly show that good and sustainable planning is only possible in close dialogue with the client based on widespread competencies in project management and the application of multiple engineering disciplines. Many years of experience and high expertise from SSF Ingenieure's core business contribute directly to the productivity and success of our foreign activities.

Export success of SSF Ingenieure abroad is inner-urban special civil engineering for traffic tunnels and metro lines, railway infrastructure for local public transport, long distance and high-speed railway lines, highly specialized civil engineering for bridge construction and industrial buildings or the overall design of event locations, arenas and exhibition buildings. Based on the experience from SSF's core business, the client abroad can count on a complete and integral solution through our especially skilled engineers who manage the international business.

---

### Baku Crystal Hall Eurovision Song Contest 2012, Baku (Azerbaijan)

---

The multi-functional hall was erected in the capital of Azerbaijan Baku at National Flag Square and is one of the new landmarks in the dynamically growing city. In May 2012, more than 100 million people all around the world experienced the Eurovision Song Contest in front of their television.

**Remarkable:** design and implementation took place within only 8 months.

**Architects:** GMP – von Gerkan, Marg und Partner

**General contractor:** Alpine Bau Germany  
**General designer and design coordinator:** NÜSSL International AG

**SSF:** structural engineering of stands and stadium roof, foundation, steel structure, interface coordination, examination of workshop drawings

---



## Quality assurance

### Our guarantee for the achievement of your goals

The projects we develop are characterised by optimum characteristics and usability. One major component here is assuring the quality of the planning and development process. Our quality management system (QMS) is certified according to DIN EN ISO 9001:2008.

Our QMS helps us to continuously improve our performance and supports us in achieving the objectives defined at the start of a project. Planning and management processes, inspection and approval procedures, scheduling and cost tracking, recording and documentation of data, assessments, analyses and processes for determining customer satisfaction are defined precisely in the form of detailed processes.

We also enhance the quality of our work through our high level of team skills and the exceptional sense of responsibility of each individual. Regular discussions about our works' results in the team, constant application of the four-eye principle and verification of important design phases (6-eye principle) guarantee the high quality demands of our clients.

#### Bridge over the Danube in Günzburg

Tied-arch bridge with arch slabs inclined towards each other in the cross section and connected to one another in the area of the cross girders to create a gate effect. The inclination of the arch slabs was consistently continued in the geometry of the substructures. The crossed and pretensioned hangers complete the characteristics of the tied-arch bridge.

**Total length:** 110 m

**SSF:** project planning and structural engineering

Civil Engineering Prize 2013 in the category Bridge Construction

*“Living, mobility, profession and recreation – there’s hardly one moment in everyday life that isn’t in some way connected to civil engineering achievements.”*

*D. Stumpf*



Services

---

*“The concepts and plans we execute generate a high level of satisfaction on the part of clients, users and operators. This acceptance is the basis for commercially successful investments.”*




---

**Second bridge over the Strelasund,  
B-96-n-slip road Stralsund / Rügen**

---

The around 2.8-km-long bridge is composed of six individual structures

**Structure 1.1:** prestressed concrete bridge (327.5 m)

**Structure 1.2:** compound steel bridge (317 m)

**Structure 2:** cable stay bridge (583.3 m)

**Structures 3 – 5:** pre stressed concrete bridges (532.3 m / 532.2 m / 539 m)

**SSF:** final design structures

---

## Structural engineering

### The basis for sustainable investment

Structural engineering is the science, one might even say art, of designing buildings, bridges, tunnels and similar structures in a cost-effective and elegant manner, so that they safely withstand all the forces they might be exposed to.

We not only design load-bearing structures but develop user-oriented structural systems with efficient foundation, floor and pillar load bearing structures, optimized in terms of material and components. They are ideally attuned to maximum flexibility of utilisation in order to do justice to future uses and expansions. In the structuring of supporting members, SSF places great emphasis on transparency and clarity.

Decisive for continuous energetic construction are the coordination of load-bearing structure and thermally effective component layers and the intelligent design of structural details. This is an important criterion to achieve investments that are durably economically successful.

*“When creating a project, you’re not looking for hard and fast or archetypal thinking, but rather for active, intellectual capital that can be transformed in a continuous dialogue with the client.”*

*"Letting a project break down into illogical details and egoistic single interests is the most counter-productive thing you can do."*

New construction of German Pavilion for Expo 2010 in Shanghai (China)

Site area: 6,700 m<sup>2</sup>

Usable space: 4,000 m<sup>2</sup>

SSF: surveys, supervision and consulting for soil, foundation and environmental protection

## Geotechnical engineering

Perfect interaction with a capable partner

As an engineering consultancy, we possess a great deal of experience in specialised civil and geotechnical engineering. Our core competencies include planning, construction management and monitoring of all types of foundation projects and underground construction (basement levels, parking structures, tunnels, caverns, underground stations, building underpinning).

As a result of our merger with Baugeologisches Büro Bauer, the SSF Group has an experienced partner on board that can offer a wide selection of geotechnical, geological and hydro-geological services.

One of the major activities of our partner in the areas of soil/subsoil consulting, geotechnology and hydrogeology are the planning and assessment of preliminary

exploration concepts to obtain dependable and comprehensive forecasts, plus detailed geological-geotechnical consulting on the foundation and creation of structures. Naturally there is always due emphasis on optimally minimising soil/subsoil risks and the costs involved, i.e. best practice and best build ability. The services of Baugeologisches Büro Bauer also include geotechnical project management in the actual construction phase plus documentation and evaluation of collected data for consistent quality assurance.

Comprehensive knowledge of, and experience in geotechnical sciences, soil and rock mechanisms, scarp stability and special-purpose excavation, petrography, sedimentology and regional soil history all guarantee the best results.



## Building construction

### Structures for individual needs

In building construction the portfolio of SSF Ingenieure ranges from wide-span halls and hangars through large railway stations and complex industrial facilities, to challenging commercial projects and representative corporate offices and administration buildings.

Enormous flexibility, attractive architecture, efficient costing, optimal completion time without exceeding cost targets, and especially high sustainability in energetic construction and use are all high priorities in our conception and implementation of projects and the resulting buildings.

Our consideration of the economy of your project does not end with the first use, but extends over the entire life cycle of the structure. The simple and economical option to convert the building at a later stage is considered in the development of the very first draft.

To solve and master complex requirements and conditions and for the precise handling of building projects, SSF Ingenieure supports its clients with a highly accomplished team of engineers and architects.

#### Our range of services

- Needs analysis and site assessment
- Conceptual design, further development and optimisation of buildings and load-bearing structures
- Area utilisation and user logistics
- Generation of complete draft, submission and working plans as expert or general planner
- Project management as well as comprehensive construction management
- Energetically optimised structural engineering
- Sustainability assessments (DGNB, LEED)

---

#### Maximilianhöfe – Marstallplatz, Munich

---

Urban building ensemble, divided into three separate structures with varying uses: new rehearsal and business premises for the Bavarian State Opera, reconstruction of Maximilianhof as a new office building, gutting and reconstruction of historic Bürklein House.  
Total gross floor area: 55,000 m<sup>2</sup>  
Total gross volume: 202,000 m<sup>3</sup>  
SSF: final design structures

---

720  
Building  
constructions



## Bridges

### Aesthetic harmony of form and function

In the conception, planning and design of bridges and engineering structures, SSF Ingenieure plays a leading role. Since the foundation of the company, it has designed, planned the construction or supervised the actual building of over 8,300 bridges and engineering structures. The company's many years of experience and accumulated expertise include the construction of a wide range of bridges, such as: large-scale viaducts and suspension bridges, cable-stayed and arch bridges, extremely inclined portal frame bridges, the complex refurbishment of railway bridges while still in use, bridge repairs, footbridges and counterpoise bridges. Holistic thinking and responsible design result in well-engineered bridges, which are designed using appropriate materials and boast an enormous variety of load-bearing structures and forms.

#### Cost-effectiveness

First and foremost, bridges always have a technical function: they join two or more different points. In a developed and intensively used environment, this requires comprehensive planning. Our passion for complex problems leads us to develop plans together with clients and construction companies. Bridges must also meet high aesthetic standards. We devote great attention to the elegance of a structure and the care in the structural details. We harmonise form and aesthetics with the structural requirements – and make sure that both aspects are economically balanced.

We aim to optimise durability and sturdiness with minimum maintenance and service costs, while at the same time creating formally attractive and ambitious structures. SSF consequently attaches the greatest importance to designing and implementing integral structures without joints and bearings as well as to efficient load-bearing structures and construction methods that, with regard to sustainability, leave a small "carbon footprint" over the course of their life cycle.

#### Bridge over the IJssel, Hanzelijn (Netherlands)

The new IJssel Bridge is part of the 50 km long new railway line Hanzelijn from Zwolle to Lelystad. The structure spans the IJssel with a length of 900 m and a width of 15 m, connecting the province capital Zwolle to the community of Hattem. In autumn 2010 the bridge has been completed.

**Construction type:** 2-tracked steel composite superstructure with a truss arch above the river and laterally attached sidewalk.

**Spans in m:**  
33,34 + 4 x 40,0 + 75,0 + 150,0 + 75,0 + 10 x 40,0 + 33,13 = 926,47 m

**Particularities:** winning design in a Design & Build awarding procedure, 927 m long structure without expansion joints, composite superstructure connected to abutments at the side of Hattem, ballast superstructure

**SSF:** draft and structural design

# 8.500 Bridges



## Tunnels

### The hidden art of construction

SSF Ingenieure specialises in engineering services for underground projects, especially tunnels and complex underground load-bearing structures. Together with the specialists from Baugelogisches Büro Bauer, we assemble teams of experienced engineers from the fields of applied geology, geotechnical sciences, rock mechanics, structural engineering, underground construction, and project and construction management for every conceivable task.

#### Designing and planning

SSF planning considers numerous construction methods (NATM and hard-rock tunnel drilling machines, shielded rock drilling machines, earth pressure balance and slurry shields for soft soil). Our specialists possess extensive expert knowledge in the calculation of tunnels and portals, deep shafts and building pits. We develop economical concepts for advancing tunnels under compressed air or by soil freezing.

#### Analysis

SSF conducts non linear geotechnical FEM analysis of complex substructure measures under consideration of primary stresses, load history and soil / structure interaction, and assesses the stability of scarps and rock overhangs including analysis of rock slide hazards. Simulation of tunnelling using the mining technique on three-dimensional and two-dimensional models, using the stiffness reaction ( $\alpha$ -method), is a speciality of SSF Ingenieure.

#### Inspection

Our experts inspect existing tunnels to assess structural and building defects, evaluate the situation, and define measures for reinforcement or repair. SSF provides preliminary cost and schedule analyses, designs and plans and supervises measures for the renovation or enlargement of tunnel tubes, caverns and underground rail installations.

# 150 Tunnels

#### Marienplatz Metro station, Munich

Widening of platform by tunnelling using the mining technique protected by freezing shield

Length of tunnel: 98 / 103 m

Initial shaft depth: 30 m

Breakthrough cross-section: 55 m<sup>2</sup>

SSF: subsidiary quotation for freezing shield, final design Engineering Prize 2005 of The Bavarian Chamber of Engineers-Civil





**Relocation of federal road B 243 west of Bad Lauterberg up to southern interchange L 604, Bad Sachsa**

Viaduct Odertal, view of temporary pylons with stay-cables for cantilever construction of the main span over the Oder valley with habitat protection zone (span width approx. 103 m) Total span width approx. 496 m

**Services rendered by SSF in construction management:**

- Construction surveys / monitoring
- Project planning and renovation design
- Construction supervision
- Supervision of railway constructions including provision of authorised technician at the interface of construction and railway operation, person charged with overhead cable on and off switch and if necessary grounding, fulfillment of administrative construction prescriptions and authorizations conferred by the German railway company DB AG for individual projects
- Construction management
- Project management and documentation
- Security and health protection on construction sites

SSF Ingenieure is prequalified with DB AG for the area of construction supervision under the application number 7 00 00 148 and has been assessed as "L1" supplier in constant evaluations.

## Construction management

### Our experts on-site

To implement complex civil engineering projects not only comprehensive designs and quality-conscious partners are necessary; an important link between the multiple participants is a proficient construction management team that in addition to technical tasks takes on all organisational and commercial activities.

SSF Ingenieure disposes of skilled specialists that, with their supplementary qualifications, ensure a flawless execution on-site and that the client's satisfaction is fulfilled. We have confident experience in dealing with the German contracting rules for the award of public works contracts (VOB), with the relevant technical prescriptions, with railway regulations, precision in organising and structuring of construction stages and competence in contract and contract addendum management which are part of our daily routine. The construction management team has excellent knowledge and long-time experience in construction supervision and supervision on site for bridges and complex building projects involving multiple trades.

So in addition to accompanying new construction projects, they are positioned with the most modern technological equipment to examine existing construction components and entire constructions and to establish surveys of existing situations and renovation designs for civil engineering structures.

Consulting the client about all questions regarding construction operation, contractual questions and contract alterations complementing the supervising and managing construction services is at the center of our management activities that are always orientated on our leading principles "quality-deadlines-costs".

## Noise protection

### Serving health and the environment

Noise is an extremely serious form of environmental pollution. Directly and indirectly it can very much impair the wellbeing and health of the individual. Consequently, combating noise has become an important facet of environmental protection.

#### Situation

In addition to the building of new traffic routes, the expansion of existing ones is becoming increasingly important – especially in densely populated suburbs and conurbations. A frequent problem is that, because of the space restrictions, multi-lane expansion is rarely possible. As a result, the route must be based on the current layout, which means action must be taken to densify or compensate for the existing construction. As the width of the roadway increases, the noise screening walls become higher as well.

#### Consequences

With noise protection, there are significant cost and authorisation issues. Structural changes to existing traffic routes or the building of new ones both involve the right of citizens to noise reducing measures. Careful and precise implementation of the conditions defined by a whole number of rules and regulations in the planning phase is decisive for obtaining a building permit. We have been working on the creation and implementation of effective noise protection measures for many years now, in close, constructive dialogue with planners and experts. The emphasis here is on devising individual noise engineering solutions for traffic routes in densely areas, and on developing technically improved and cost-optimised alternatives.

#### Noise protection structure Freimann, Munich

Constructed as part of the six lane expansion of the A 9 motorway in the inner city area curved, shell-shaped prefabricated concrete parts with highly absorbing aluminium cladding on steel posts, torsion beams and augur piles  
**Length overall:** 2,600 m  
**Total area:** 22,000 m<sup>2</sup>  
**Height:** up to 9 m above top edge of road and 14 m above ground  
**SSF:** object planning and structural engineering design

*“What was inspired yesterday has made the further development of planning, material, logistics and processes uneconomical today. So we’re faced with fresh challenges every day. What could be more rewarding in our profession?”*



---

**Marshland south-east of Andechs**

---

Concept for landscape development in the Munich region services partner company Prof. Schaller UmweltConsult GmbH (SSF Group):

- landscape planning
  - ecological reports
  - ecological supervision of constructions
  - ecological monitoring
  - environmental planning
- 

## Landscape and environment planning

### The ecologic basis

The preservation of a liveable environment is considered as a matter of course by responsible engineers. SSF Ingenieure conscientious of that has already years ago decided to offer environment and landscape planning and design as integral constituent of its array of services. Together with Prof. Schaller UmweltConsult GmbH, we solve proficiently all environment related questions within the SSF Group.

Especially infrastructure and large-scale construction projects require complex studies on environment tolerance as well as considerations of species protection so as to be approvable. Prof. Schaller Umweltconsult disposes of extensive national and international experience and contacts to relevant partners in this area. The company supports private and public clients in all stages of administrative approval procedures as well as during project management. In addition to traditional landscape planning services such as establishing of landscape and green area plans, renaturalisation and recultivation plans, conservation and development plans, it provides services of landscape architecture such as object, design and execution planning. Biologists are part of the team, too, and give their expert advice on environment protection planning and cartography. Furthermore, ecologic expert reports are established.

To deal with all environment related questions, a highly efficient geographical information system (ESRI-GIS) is in use to support the collection, processing and evaluation of environmental data as well their presentation.

## Railroad construction

### Optimal performance all along the line

The basis of every rail system is its civil engineering and structural traffic infrastructure. Well-thought-out concepts and quality-oriented construction of railway infrastructure ensure at long-term the performance and availability of both high-speed trains and lines with mixed traffic, as well as underground networks or urban rail systems.

Intelligent route and station infrastructures, easy access and long-term ride quality are decisive factors for sustained passenger volume, sufficient passenger comfort and efficient and economical operations. With its extensive knowledge and understanding of how the numerous elements of railway networks and their interfaces interact, SSF is able to optimally support clients in all phases of a project.

SSF Ingenieure performs a wide range of services in the area of construction and geotechnical engineering for rail infrastructure – from routing through tunnels and bridges to stations and halts. We draw on a wide range of experience in the planning and development of railway infrastructure and the development of construction methods tailored to the needs of railway operations (e.g. lateral shifting of bridges, cut and cover bridge erection, VFT®, VFT-WIB®, VFT-Rail®). We design slab track for high-speed networks, develop mass suspension systems, perform noise and acoustic calculations as well as vibration and shock calculations.

In cooperation with our partners, we cover all rail-relevant issues – such as traffic forecasting, equipment and railway technology, organisation and operation, and maintenance.

---

#### NBS high speed line Nuremberg-Ingolstadt, North lot

---

New ICE rail link as an extension of VDE project No. 8 from Berlin and Erfurt to Nuremberg, as well as part of axis No. 1 (Berlin – Verona – Palermo) of the trans-European networks.

**Overall length:** around 35 km

**SSF:** general planning of all works (particularly route, structures, tunnel, slab track, rail technical finishing works, railway right of way)

---

## 4980 Railway projects



# Roads

## The foundation of our mobility

SSF Ingenieure is a single source for planning and engineering services, and project and construction management services for all kinds of traffic projects.

Together with the affiliated firm Wagner Ingenieure GmbH and the business units for building and structure planning and geotechnical engineering, we offer engineering consultancy services throughout all phases of infrastructure projects. Our experience and broad-based expertise create planning approaches with efficient and innovative solutions in the conceptual planning, new construction and expansion of roads and motorways, motorway services, and the infrastructural links to airports, railway stations and industrial and commercial parks.

The demand for ever more complex and high-performance infrastructure systems with concurrent consid-

eration of environmental protection has resulted in a major change in how traffic and road planning is approached and implemented.

- Traffic forecasting
- Traffic progression effects
- Environmental impact and compatibility
- Multiple benefit/cost analyses
- Regional/supra-regional scale
- Regional structure and regional sensitivity analysis

The above aspects are important criteria for the buildability of infrastructure projects and require a high level of interdisciplinary knowledge in the design phase. Together with its proven cooperating partners, the SSF Group offers a virtually comprehensive selection of consulting and planning services.

### Motorway A9 Expansion of interchange Neufahrn – flyover

The conversion aimed at adapting interchange Munch North to higher traffic frequency. Coming from Munich Airport, from direction Deggendorf, a direct ramp onto A9 in direction Munich was built. In the course of this project, the four mentioned new bridge constructions and adaptations of existing structures became necessary whilst maintaining traffic at the same time.

SSF: project planning and structural engineering

*“Transparent and light structures, clear and modest constructions as well as conscientious designs of structural details correlate with our striving for efficiency, functionality and beauty.”*






---

**VFT-WIB® construction method  
developed by SSF Ingenieure**

---

Girder system for superstructures with a high level of prefabrication and external reinforcement.

Girders for an integral road bridge near Vigaun / Austria: 3 x 26.15 m span width, prefabricated rolled girders, composite dowels in fin-cut design ½ HEM 600 x 399, grade S 460

---

## Application development

### Linking steps to reach creativity

Research and development are at the basis of the continuous optimisation of buildings and infrastructure constructions in the view of their efficiency, security and sustainability and progressive design. The technical opportunities resulting from the combination of new construction materials, calculation methods and changing construction procedures are enormous.

To fulfil the clients' as well as the construction companies' individual wishes and to satisfy the presented requirements in an optimized way, it is important to know and master not only the current construction methods and procedures but also to continuously improve and develop them. At SSF Ingenieure we have established our own department for application development which dedicates its work to subjects and questions concerning further and new development of construction methods and procedures independently from the daily constraints. One of the outstanding examples for the development of a new construction method at our company is the VFT® construction method showing consequent implementation of an idea to make it ready for the market. Moreover, development and constant improvement of certain techniques and procedures take place in our operative departments in various means.

The first patent for bridge launching 25 years ago – meanwhile state-of-the-art –, top-down construction for railway bridges and under compressed air for tunnel construction, several German and European patents for maglev tracks or patent applications for mass-spring-systems and numerous utility model registrations (e.g. VFT-WIB®, VTR®, light noise protection installations), all these innovations show that we keep our fingers on the pulse and do not stop to improve existing technologies and to achieve innovations by constant modifications. Linking sometimes small but sustainable steps leads to creativity.

## Remedial engineering

### Analysis comes first

The preservation, conversion and expansion of existing structures are a further focus of our activity. SSF examines and documents the condition of structures, buildings and load-bearing structures. We seek to understand and respect them in order to properly modernise them, convert or expand them, and if necessary repair or renovate them.

When it comes to preserving existing building fabric, expanding a structure, or integrating it in a new building, plus enhancing its durability and usability through foundation repair, it is vital to examine a structure, identify damage, and report deficiencies.

For many years, we have been conducting structural examinations, and major inspections on buildings, bridges, tunnels and other engineering structures.

Developing a specific repair or maintenance programme and calculating with a precise budget means determining the nature, scope and sequence of the necessary measures. The basis for such a catalogue of measures is assessment of the structure and its exact condition, including appropriate calculations of the load-bearing structures and cost-effectiveness.

Our team possesses in-depth knowledge and experience in the area of structural inspection and appraisal and is equipped with the necessary specialised testing and inspection equipment. This enables careful, thorough inspection of structures and components.

#### SSF can prepare

- Expert opinions, assessments and recommendations for existing load-bearing structures of bridges, tunnels and other constructions, building structures and industrial installations
- Load-bearing structural analyses for planned conversions and additions
- Repair plans, tenders
- Project and construction management

---

#### Dresden Central Station

---

Major restoration and alteration of platform halls. The design of Sir Norman Foster was characterised by the covering of all platform halls with a teflon-coated fibre-glass skin (membrane roof).

**Footprint:** 25,500 m<sup>2</sup>

**Overall length / width:** approx. 240 / 122 m

**Height:** approx. 35 m, Roof area: 30,000 m<sup>2</sup>

**SSF:** general planning of all works construction and object planning and structural engineering design

Structural Award for Infrastructure 2007, Deutscher Stahlbaupreis 2008 (Award)

---





#### Stadsbrug Nijmegen (Netherlands)

The road bridge in Nijmegen crosses the river Waal as tied arch bridge with a span width of 285 m. The lengths of the foreland bridges amount with single spans of 42,5 m to a length of 294 m on the south side and on the north side to a total length of 679 m. The filigree middle arch that spans the river and dissolves into portals towards the abutments is around 60 m high. It supports the 27 m wide bridge deck by crossed hangers. The deck's cross section consists of a wide hollow steel box with concreted composite slab made of reinforced concrete.

SSF: assembly design of tied-arch bridge

## Structural analysis

### Optimum optimisation

In addition to the "conventional" preparation of static calculations as part of structural engineering, structural mechanics studies are becoming increasingly required for special component-design tasks. This applies in particular to the required simulation of failure processes with respect to inconsistencies of static and dynamic analyses due to non-linear material characteristics.

SSF has extensive knowledge and experience in performing structural analysis using the finite element method. We exclusively use latest-generation software to analyse load-bearing structures and components with the broadest possible range of dimensions, material properties and loads.

#### Our analytical service range includes

- Structural analyses and component dimensioning, optimising of components
- Analyses of the linear elastic stress of load-bearing structures and components (under static load) to optimise materials
- Non-linear material and geometric analyses
- Stability analyses of load-bearing structures and components
- Vibration analyses including resonant frequencies, harmonic frequency domain analyses and time domain spectral analyses
- Fully dynamic analyses including shock, impact and drop tests
- Fracture-mechanical analyses
- Fatigue calculation of single components and local load transferring regions, calculation of structural tension
- Non-linear geotechnical FEM analysis of complex foundation constructions taking into account primary stresses, load history and soil / structure interaction
- Simulation of tunnelling using the mining technique on three-dimensional and two-dimensional models, using the stiffness reaction or  $\alpha$ -method
- Thermal effects: temperature distribution, heat conduction, heat stresses

## PPP / BOT projects

### Reliably assessing opportunities and risks

On top of its classic engineering activities, SSF offers extensive consulting and support in PPP (public-private partnership) and BOT (build operate transfer) or comparable projects. These range from management consulting, project development and project controlling, the generation of technical risk analyses as a supporting decision-making criterion for project financing, to participation in the development of financing models.

As the public sector is neither able to provide sufficient financial resources for all the many tasks nor implement these within a suitable time frame, the number of PPP / BOT projects will increase significantly in the medium term.

Sound expertise and experience plus innovative ideas are indispensable for reliably estimating and assessing potential projects in the developmental or bidding phase as regards their technical and financial opportunities and risks. By their nature, large-scale construction projects in the infrastructure segment entail a full range of planning, operational and strategic risks and a wide variety of conflicts. These must be identified, assessed and classified preventively to ensure interruption-free processes and costing reliability.

In the tender phase, we give consortia, banks and insurers that finance or provide security for PPP projects, the necessary and secure background – either in association with its affiliated companies or for joint ventures with national / international consulting companies.

As an independent engineer focused on value engineering, SSF supports you with its expertise and long-standing experience in all aspects of risk analysis, technical feasibility evaluation and investment costs.



#### **A8 west motorway, Ulm – Munich, Augsburg – Munich section**

Pilot project for the construction, maintenance and operation of a motorway in Germany under the operator model as part of a public-private partnership (A-model). Expansion of motorway to six lanes over 37 km from Augsburg to Munich with optimisation of gradients. 52 km operating section (concession area). Average daily volume up to 100,000 vehicles / day. **SSF:** object planning as well as structural engineering design for the licensee by Wagner Ingenieure GmbH (SSF Group). A number of bridging structures on this section were realised using VFT® construction, developed by SSF Ingenieure.

Contact

---

*“Our goal is to design and realise high-quality, cost secure and sustainable buildings and infrastructure projects in close cooperation with our customers on the basis of mutual trust.”*

## Offices

### SSF Munich

#### SSF Ingenieure AG Consulting Engineers

Domagkstrasse 1a | 80807 Munich / Germany  
T + 49 (0)89 / 3 60 40 - 0 | F + 49 (0)89 / 3 60 40 - 100  
muenchen@ssf-ing.de

### SSF Munich

Head office of SSF Ingenieure AG  
at Domagkstrasse in Munich

#### Headquarters SSF Group, Munich

Baugeologisches Büro Bauer GmbH  
Prof. Schaller UmweltConsult GmbH  
Wagner Ingenieure GmbH

Headquarter  
Lang Hugger Rampp GmbH Architekten

### SSF Berlin

#### SSF Ingenieure AG Consulting Engineers

Schönhauser Allee 149 | 10435 Berlin / Germany  
T + 49 (0)30 / 4 43 00 - 0 | F + 49 (0)30 / 4 43 00 - 600  
berlin@ssf-ing.de

### SSF Halle

#### SSF Ingenieure AG Consulting Engineers

Schillerstrasse 46 | 06114 Halle / Germany  
T + 49 (0)345 / 21 14 - 0 | F + 49 (0)345 / 21 14 - 800  
halle@ssf-ing.de

### SSF Düsseldorf

#### SSF Ingenieure AG Consulting Engineers

Graf-Adolf-Straße 61 | 40210 Düsseldorf  
T + 49 (0)211 / 205 410 - 60 | F + 49 (0)211 / 205 410 - 79  
duesseldorf@ssf-ing.de

[www.ssf-ing.de](http://www.ssf-ing.de)



## SSF Group

SSF offers you a comprehensive and client-oriented service, with integral solutions that exactly match your requirements. For this purpose, the following companies have joined SSF Ingenieure AG:

### Baugeologisches Büro Bauer GmbH

geology | hydrology | subsoil

Domagkstrasse 1a | 80807 Munich / Germany  
T + 49 (0)89 / 3 60 40 - 465 | F + 49 (0)89 / 3 60 40 - 54 65  
markus.bauer@baugeologie.de | www.baugeologie.de

### Prof. Schaller UmweltConsult GmbH

environmental planning | landscape planning | ecological reports

Domagkstrasse 1a | 80807 Munich / Germany  
T + 49 (0)89 / 3 60 40 - 320 | F + 49 (0)89 / 3 60 40 - 53 20  
info@psu-schaller.de | www.psu-schaller.de

### Wagner Ingenieure GmbH

traffic installation planning

Domagkstrasse 1a | 80807 Munich / Germany  
T + 49 (0)89 / 68 08 96 - 3 | F + 49 (0)89 / 68 08 96 - 59  
kontakt@wagner-ingenieure.com | www.wagner-ingenieure.com

### Europrojekt Gdańsk S.A.

traffic installation planning | structural engineering

ul. Nadwislanska 55 | 80-680 Gdansk / Poland  
T + 48 (0)58 / 3 23 99 - 99 | F + 48 (0)58 / 3 23 99 - 98  
europrojekt@europrojekt.pl | www.europrojekt.pl

### S.C. SSF – RO s.r.l.

structural engineering

Str. Splai Tudor Vladimirescu Nr. 12, Ap. 6 | 300.195 Timisoara / Romania  
T + 40 (0)256 / 20 10 21 | F + 40 (0)745 / 60 73 25  
office@ssf.ro | www.ssf.ro

### PEC+S Planning, Engineering, Consulting + Services GmbH

consulting und supervision for the Chinese market

Domagkstrasse 1a | 80807 Munich / Germany  
T + 49 (0)89 / 3 60 40 - 455 | F + 49 (0)89 / 3 60 40 - 54 55  
mscholz@ssf-ing.de

### PEC+S Beijing Planning, Engineering, Consulting + Services Ltd.

representation for PEC + S in China

6 / F TongGuang Mansion | No. 12 Nong Zhan Nan Li  
Chaoyang District | 100026 Beijing / China  
T + 86 (0)10 / 65 38 - 93 89 | F + 86 (0)10 / 65 38 - 93 90  
beijing@pecs-asia.com

### SSF do Brasil

### Consultores e Projetistas em Engenharia Ltda.

consulting for the Brazilian market

Condomínio Edifício Itália | Av. São Luís, 50 - Andar 20, Cjto 201C  
CEP 01046-926 Centro – São Paulo / Brasilien  
T / F + 55 11 3728 9479  
contato@ssf-eng.com.br | www.ssf-eng.com.br

## Memberships

### SSF Ingenieure is a member of the following German professional associations and chambers

- BAB – Professional Association of Freelance Architects and Structural Engineers e. V.
- Bavarian Chamber of Engineers - Civil Engineering
- FIDIC – International Federation of Consulting Engineers
- DBV – Association of Concrete and Construction Technology e. V.
- DVWG – German Association of Transport Sciences e. V.
- FGSVI – Research Association for Roads and Traffic e. V.
- Friends of Civil Engineering of the TU Dresden e. V.
- IABSE – International Association for Bridge and Structural Engineering
- IAI – Industrial Alliance for Interoperability e. V.
- Association of Engineering Art e. V.
- VDEI – Association of German Railway Engineers e. V.
- VDI – Association of German Engineers e. V.
- VBI – Association of Consulting Engineers
- Associations of Road Construction and Traffic Engineers  
VSVI Bavaria e. V.  
VSVI Berlin-Brandenburg e. V.  
VSVI Saxony-Anhalt e. V.

### SSF is also actively involved in important industry committees:

#### AHO – Fee Structure Committee of the Engineer and Architect Associations and Chambers e. V.

- Special Commission for Construction Engineering / Structural Engineering

#### Bavarian Chamber of Engineers – Civil Engineering

- Working Group for Cooperation and Foreign Trade
- Working Group for Innovation in Building
- Education Committee
- Salaried and Civil Servant Engineers Committee

#### VDEI – Association of German Railway Engineers e. V.

- Joint Working Group for Railroad Construction of the Engineer Associations VDEI Working Group for Construction Engineering

---

#### ICE – workshop Leipzig

---

New construction of a maintenance facility

##### Architects:

Lang Hugger Rampp GmbH Architekten

Floor space: 11,200 m<sup>2</sup>

Spans of roof framework: approx. 65.00 m

Total length / width:

approx. 91.00 m / 74.00 m

Height: approx. 18.50 m

SSF: general planning

---





#### BMW Welt, Munich

BMW AG promotional and distribution centre

Architects: COOP HIMMELB(L)AU Wolf D.Prix/W. Dreiholz & Partner ZT GmbH

SSF: final design structures and object, overall construction management and supervision

## Fast Facts

Head office	Munich, Germany
Address	SSF Ingenieure AG, Consulting Engineers, Domagkstrasse 1a, 80807 Munich, Germany
Phone and Fax	+ 49 (0)89 / 3 60 40 - 0 + 49 (0)89 / 3 60 40 - 100
e-Mail	muenchen@ssf-ing.de
Internet	www.ssf-ing.de
Number of offices in Germany	4
Locations	Munich, Berlin, Halle, Düsseldorf
Offices abroad	Brazil, China, Poland, Romania
Employees	approx. 230 (01 / 2014)
Year established	1971 (Schmitt & Stumpf GbR)
Supervisory board / Management board	V. Schmitt, D. Stumpf, W. Frühauf / C. Schmitt, A. Braun, H. Wolf
Services	Complete management and planning services in civil, structural and geotechnical engineering and environmental planning
Legal form	AG (non-stock corporation)
Registered	Munich district court, HRB 189.061
VAT registration	DE 129 472 191
Quality management system	certified to DIN EN ISO 9001:2008
Insurance	VHV Versicherungen; Hannover, personal and property insurance

## Imprint

### Published by

SSF Ingenieure AG | Domagkstrasse 1a | 80807 Munich / Germany | [www.ssf-ing.de](http://www.ssf-ing.de)

### Responsible for the content

R. Rossiello-Bianco

### Photos

Florian Schreiber Fotografie

### except

Page 10/11 Lang Hugger Rampp GmbH Architekten, Page 16/17 Nüssli International AG, Page 24/25 Milla und Partner / Schmidhuber+Kaindl, Page 31 Carsten Kykal – Fotolia.com, Page 32 SSF Ingenieure AG, Page 36 Prof. Schaller UmweltConsult GmbH, Page 38 Photographie Wolfgang Seitz, Page 45/57 Ulrich Windoffer, Page 46 photography: Thea van den Heuvel / DAPh

### Design

ediundsepp Gestaltungsgesellschaft mbH, München  
[www.ediundsepp.de](http://www.ediundsepp.de)

### Text

SSF Ingenieure AG

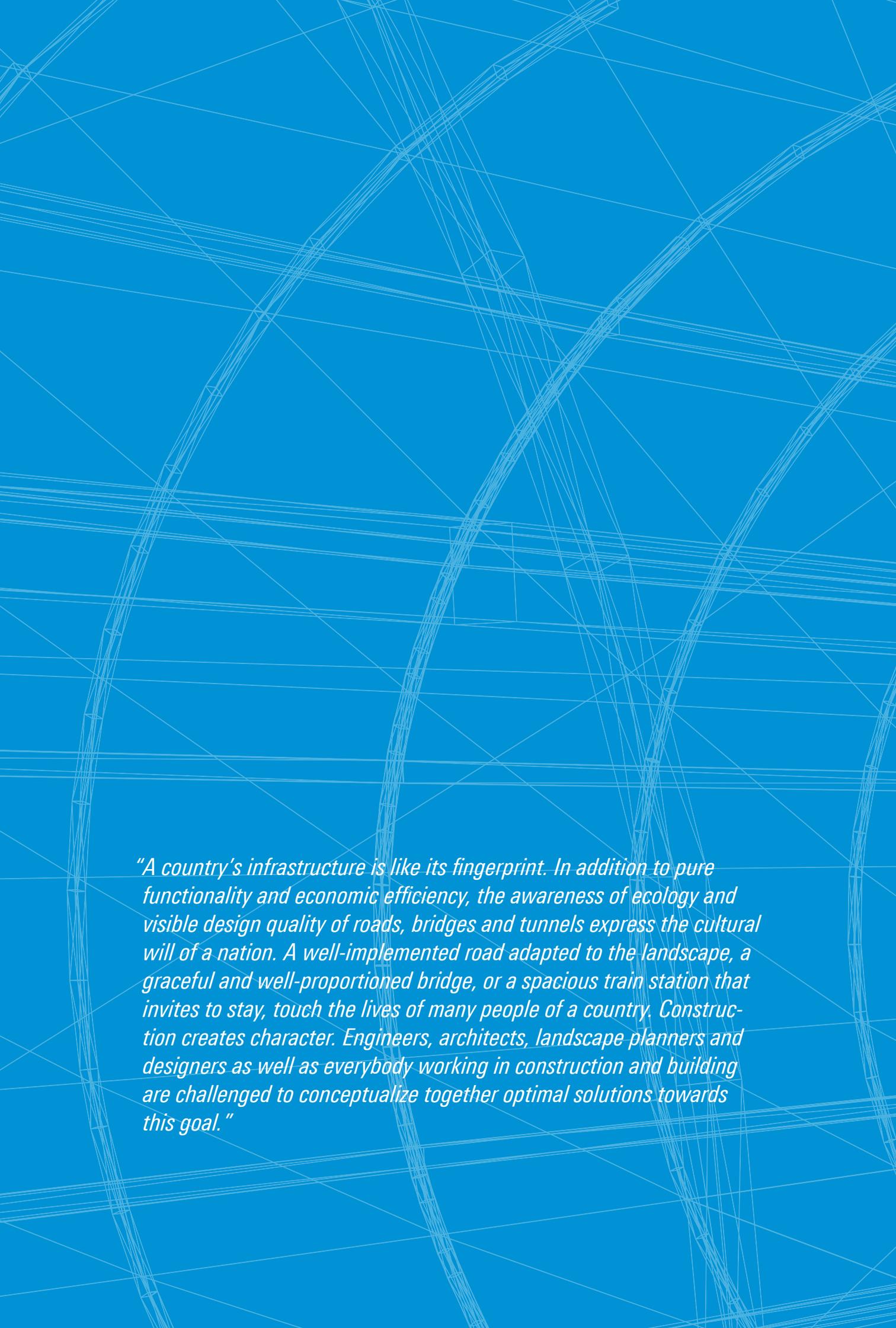
### Printing

Joh. Walch GmbH&Co. KG, Augsburg  
[www.walchdruck.de](http://www.walchdruck.de)

Subject to change without notice

© 2014 SSF Ingenieure AG

For reasons of readability, in this brochure only the masculine form has been used to describe persons. The use of the masculine includes also the feminine.



*"A country's infrastructure is like its fingerprint. In addition to pure functionality and economic efficiency, the awareness of ecology and visible design quality of roads, bridges and tunnels express the cultural will of a nation. A well-implemented road adapted to the landscape, a graceful and well-proportioned bridge, or a spacious train station that invites to stay, touch the lives of many people of a country. Construction creates character. Engineers, architects, landscape planners and designers as well as everybody working in construction and building are challenged to conceptualize together optimal solutions towards this goal."*

