

# Special Issue Intertraffic 2006

Traffic Engineering and  
Noise Control



FORSTER - AKTUELL

The magazine for staff, customers and friends of the Forster Group

Special Issue 1 • 2006

**D**ear Friend,  
Dear Staff Member,

On the occasion of the Intertraffic 2006, we want to use this special edition of Forster Aktuell to introduce you to selected products in our traffic engineering and noise control departments. Our reference products described in this issue are representative for all those orders that our customers have entrusted us with. In implementing these products, we had an opportunity to prove our competence and capacity to carry out major projects. Our constant efforts to extend and improve our product range and to develop new products for the benefit of our customers are a key element of our corporate policy. As a result, you will once again find several novelties and product improvements in this issue of Forster Aktuell. Structural measures to control noise along railways and roads improves the quality of life for the residents along the line. As professional noise controllers we know exactly which requirements need to be met by an efficient system and have made them the benchmark for our new product development.

Yours,



Christian Forster, Chairman of the  
Managing Board, Forster AG

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We are your reliable partner

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# We are your reliable partner

*I*n meeting their responsibility for traffic safety, road operators are always faced with new challenges. To cope with these new tasks, they need reliable partners that can offer competence and dependability. For a company like Forster that is strongly anchored in the project business segment it is a matter of essential business policy to ensure that every aspect – from quotations to installations – will be handled free of any friction.



Accordingly, the Forster Group has established a high degree of project competence: once we are awarded a contract, we plan the



workflow down to the last detail, prepare the permit documentation, perform the stress analysis, arrange for materials and equipment to be supplied and define the installation process. Alongside these steps, we carry out negotiations with all other trades and authorities involved and undertake the requisite project site supervision.

The high degree of manufacturing penetration is another typical feature of the Forster Group. Thanks to state-of-the-art production plants

and carefully planned technologies, we can exploit all the synergies offered within the Group, from manufacturing installation equipment to producing, installing and commissioning traffic signs. The result is superior product quality and – of course – customer satisfaction.

Another strong point of Forster's is finding solutions tailored to customer and project requirements: for us, our customers are always our partners in our quest for perfect solutions.



# Austria's Motor

Forster supplies the gantries for



*F*or an intelligent motorway, motorists need look no further than Tyrol. The traffic control system (TCS) installed by motorway owner and operator ASFINAG is the first section of a traffic management and information system designed to cover all of Austria. The contract to build and install the system was awarded to Siemens jointly with Kabel – Elektro – Montage GmbH and Hitthaler Trixl BaugesmbH.



For car drivers, the most attention-grabbing element of the Tyrol TMS will certainly be the indicator gantries. Forster Verkehrs- und Werbetechnik GmbH was in charge of manufacturing and installing these gantries together with the jibs and tubular poles. Altogether 78 frame-beam structures complying with ASFINAG standards were set up at the Inn Valley Motorway A12 between Vomp and Zirl, and on the A13 between Innsbruck and the border to Italy. Of these, 24 span two car-

# ways Get Brainier

## for the Tyrol traffic control system

riageways and altogether six to eight lanes. Their axes extend for up to 35 metres. The gantries were fitted with LED indicators, variable prismatic message signs, traffic recorders as well as visibility and light sensors.

The system further includes 13 directional gantries of a special hinged frame type and 11 jibs of the single-beam type, fitted with variable prismatic message signs (11 locations). Another 32 tubular pole structures with variable prismatic or LED signs complete the information devices at the altogether 134 locations.

### Assembly

The gantries were fitted with information indicators and recording sensors at the Waidhofen/Ybbs works before being shipped to their sites, where they were set up between May and November 2004. Up to 10 sites were completed per week in a total of 100 night shifts. Technicians and assembly crews met with the ultimate challenge in dealing with special structures where signs were fitted to the underside of bridges, piers and buttress walls at the Innsbruck intersection. Thanks to the excellent and constructive co-operation with all



Installing the gantries took a hundred nights.

companies involved, the project engineers and maintenance depots, it was possible to complete the works within schedule.

The Traffic Control System Tyrol is part of an Austria-wide traffic management and information system envisaged by ASFINAG to monitor

and guide traffic on Austrian motorways and carriageways. The control sub-centre is accommodated at the chief toll office at Schönberg, from where it supplies all relevant data to the heart of the system: the main control centre in Vienna-Inzersdorf.



# 6 Road Section Control System for

Forster delivers Austria's offering to

*I*n 2005, Forster was awarded an attractive contract by the German state of Rhineland-Palatinate: with 25 gantries spaced on a length of 30 kilometres, the section control system between Kaiserslautern-Einsiedlerhof and Wattenheim junction on the A6/A63 motorway will be the largest installation of its type in Rhineland-Palatinate.



Contracted by the State Road and Traffic Department of Rhineland-

Palatinate to Forster Verkehrs- und Werbetechnik, the system ensures

more safety and better performance for the state's key traffic link, which counts a traffic volume of up to 60,000 vehicles per

day. The improvement is particularly important in view of this year's World Football Championship: it will certainly help steer the large crowds of spectators to Kaiserslautern and get the town fit for its role as host to the World Championship.

The contract comprised all components – display units, data collection devices, energy supply and data transfer systems, plus the requisite software adjustments.



# For the A6–A63 at Kaiserslautern 7 for the 2006 World Football Championship

Implemented in  
April to  
November 2005

With its exactly-on-time completion, Forster once again duly impressed its customers, managing the feat in spite of an extremely tight schedule. A section of 30 kilometres in length was fitted with altogether 25 steel gantries equipped with variable LED traffic signs. The signs incorporate a total of 113 LED devices based on printed circuit boards originating from Forster.



The gantries were fitted in just 15 minutes while the motorway was shut down either way.



The foundations for the gantries were part of the contract.

The gantries are of the walk-on type to ensure access for maintenance workers regardless of the traffic. The gantries were pre-assembled in the established manner at the Waidhofen/Ybbs plant, delivered

had been dug. The contract also included the foundation for and fitting of 23 sectional control cabins. The cabins themselves were provided by the client

to the site and raised in all of 15 minutes while the motorway was shut down in both directions. This work was carried out at night.

Preparatory to the installation, 860 cubic metres of reinforced concrete foundations had been cast to stabilise the gantries, and cable ducts of 18 kilometres in length

as prefabricated concrete parts. The sectional control stations, the communications controller and an extension of the control substation were also included in the scope of delivery.

The official deadline for completion is scheduled for the 11<sup>th</sup> of April 2006.



# Parking and Traffic Management

Trust Forster traffic engineering



The two football associations of Munich, FC Bayern München and TSV 1860 München, realised a

dream when they got their new football stadium at Fröttmaning, one of the most handsome arenas in the world. After less than three years of construction, the Allianz Arena was ceremonially opened in May 2005. The project involved a number of public infrastructure measures, including numerous roads, bridges and car parks.

to establish a large-scale parking and traffic management system in the vicinity of the new arena. As a subcontractor to Thomas Verkehrstechnik, Forster produced the requisite gantries, jibs, side-sign structures and variable prism message signs. The gantries are delicately laced trusses made of aluminium. All 11 gantries and the three jibs are accessible by a maintenance catwalk closed off by a lockable gate at the bottom of the ladder. At a clearance height of 4.5 metres, even large lorries can pass without problems. Where necessary,



## Straight scoring

To help all comers home in on the football grounds, it was necessary

# System Around The Allianz Arena

## ing to find you a parking space

bridges are provided with a crash protection pursuant to ZTV-VZB 94.

### The champion of motorways

With more than half of the spectators arriving by coach or car, the motorways in the vicinity of the stadium had to be prepared for the onslaught. A new junction at Fröttmaning-North was opened at the A99 (Munich ring road), which allows spectators to gain the stadium without any problems. Commissioned by Siemens AG, Forster supplied the requisite gantries and variable prism message signs for this part of the traffic management system. To ensure optimum maintenance, all gantries were designed and constructed as walk-on platforms.

### Austria's entry to the championship

Soccer fever is bound to come to a pitch at the championship. And while the Austrian national team did not make the qualification, another Austrian team made a vital contribution to the success of the



games. Traffic guidance systems of the top quality and perfect function that can be expected of Forster designs will get everybody there in time – after all, who wants to miss

the starting whistle just because they have taken the wrong motorway exit. Forster Verkehrstechnik guarantees optimal service and takes care that no spectator will run off side.



# 10 A2 Southern Motorway – General Re

## A perfect symbiosis of noise

One of the busiest roads in Austria and, indeed, in all of Europe, is the section of the A2 Southern Motorway extending on either side of the Vösendorf junction at the border between Vienna and Lower Austria. Day after day, some 150,000 cars pass along this section. The rehabilitation project encompassing the A2 is designed to get a proper grip on this enormous traffic volume.



Some 1000 m<sup>2</sup> of type 3 DG sheeting and antidew overlay film were applied to the overhead signs.

Forster Verkehrstechnik was commissioned by Alpine Energie GmbH & Co KG to provide all of the traffic engineering systems for the section. Faced with an extremely dense traffic situation in a highly precarious balance, Forster was forced to employ a maximum amount of flexibility. The traffic flow did not accept the slightest impairment so that installation work typically took place at night and involved the whole gamut of traffic safety measures. All gantries were pre-



fabricated at our plants so as to ensure that they would be quickly and smoothly installed on site. Their transport to the site was done by low-bed trailers. The construction works involved frequent changes of the traffic flow direction, so that the overhead signs had to be repeatedly adapted to temporary situations. Yellow signs and sectional to full masks were used to adjust the routing system in line with the work progress, to keep obstructions to an absolute minimum.

# habilitation of the Vösendorf Junction

## control and traffic engineering

### Scope of delivery

The contract extended to 19 steel gantries of the single beam type, 13 of them suitable for walking, as well as 29 open-type variable prismatic message signs and three walk-on steel jibs. Nine existing gantries had their overhead signs replaced or newly added, and some of the gantries were retrofitted with maintenance catwalks.

### Noise stopper

For this project, Forster Metallbau also supplied the aluminium noise barriers. These were ordered by Alpine - Mayreder Bau GmbH,

ARGE Alpine - Mayreder - PTU - Allbau and ARGE Strabag - Heilit + Woerner. To ward off monotony along a section of 8 kilometres in length, the architectural office K2 developed a colour code system that uses basic colours to point the way: red to home in on Vienna, green to go to Styria, and yellow/blue for Lower Austria. The idea added colour as well as logic to the walls. Pictographs indicating road names by coloured panels also help drivers choose the



right way. The noise barriers consist of aluminium and glass panels with an excellent noise absorption capacity on one or both sides. Altogether, more than 20,000 m<sup>2</sup> of panels were fitted, up to a height of 5 metres. Delivery and installation of the gantry uprights and concrete elements were included in the first instalment. For their mounting, the A2 motorway had to be closed for three days.

# Rehabilitation of the Haid-

## Traffic engineering components



The total makeover and enlargement provided for the A1 Western Motorway between Haid and Sattledt has finally been completed. The section was released for traffic and returned to motorists in early October 2005.

The overhaul and addition of new lanes to get a total of six lanes achieved not only an improvement in the traffic flow but was a big bonus for traffic safety as well.

Within the scope of this traffic engineering project, Forster delivered and installed the

jibs, fitting them with variable prismatic message signs and Alform-3 signs. Standard traffic signs and the foundations for the stand-up signs were also included in the contract. The project was implemented between September 2004 and October 2005.

Noise abatement for the neighbours was given a high degree of consideration: some 15–20% of the total investment costs were spent on large-scale noise control measures along the motorway.

### Noise barriers

At the Salzburg lane, the Forster crew installed the first batch of aluminium noise barriers already in the summer of 2004. For this first section, 11,100 square metres of aluminium noise control panels and 550 square metres of transparent



# Sattledt Section Completed

## and noise barriers made by Forster



The inscription (the local name for Upper Austria) consists of black metal letters of a height of 2 metres. The coat of arms was digitally printed.

frames were fitted along a section of 3.6 kilometres in length.



In the autumn of 2005, the four noise barriers ordered for the opposite lane were completed. Once

again, the novel noise abatement panels of type SE11 were used.

The 2.5 kilometre section, consisting of 6,000 square metres of aluminium panels and 100 square metres of transparent frames, will screen off neighbours from the noise generated by the traffic.

The colour scheme, created by DI Dr. Stefan Lueginger from Linz in co-operation with the Provin-

cial Government of Upper Austria, combines a total of 14 nuances. Design features such as inscriptions and symbols got pride of place on the panels.

### Snow clearance

Forster noise control panels are designed to withstand intense snow clearance efforts.

A European standard (EN 1979-1:2003) published on the subject of "dynamic load from snow clearance" specifies testing regulations. Forster quality panels pass its requirements for noise barriers with flying colours.

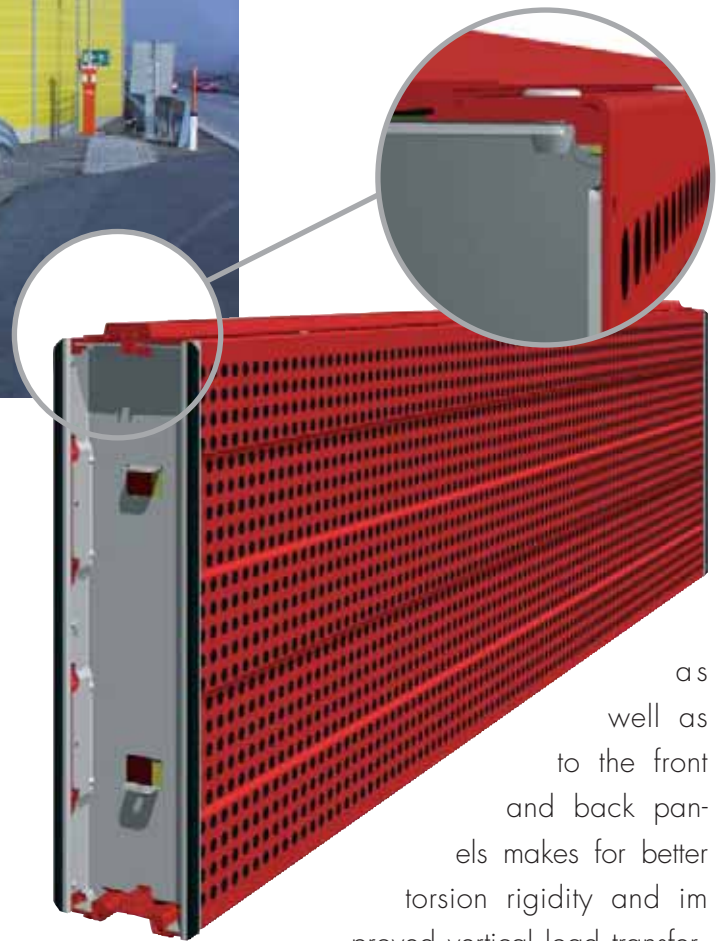


# New Noise Control Elements For

Universally applicable – naturally



new element was achieved by double profiles and a new design for the lateral covers. Riveting these covers to the upper and lower chords,



**R**equirements which have to be met by noise abatement elements have become ever more stringent in recent years. Forster Metallbau has risen to the challenge and developed a new generation of noise barriers.

With greater mobility generating ever more traffic and the new high-speed railways adding to the racket, noise barriers need to offer

an ever better performance.

Our innovative system accounts for the extreme dynamic loads which affect the fatigue limit as a key criterion. The greater stiffness of the

as well as to the front and back panels makes for better torsion rigidity and improved vertical load transfer.

## Benefits offered by Forster noise control elements:

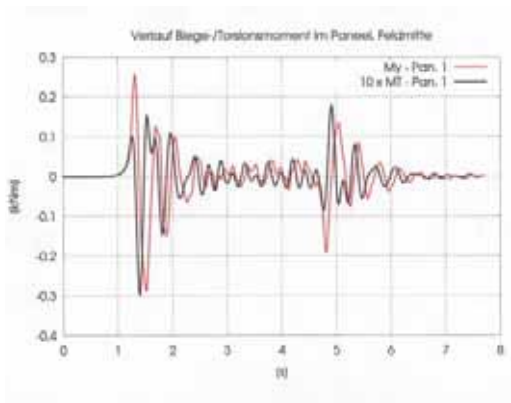
- elements comply with the latest requirements
- systems are designed in line with a newly developed calculation method
- tested and proven quality
- the most cost-effective solution for each application

## System life

A key criterion for judging noise barriers is their useful life. A newly developed calculation method, combined with practical test runs, produced excellent results. Using a

# For Road, Railway and Building

Especially also along high-speed routes



Dynamic load diagram (300 km/hr).

**Software simulations, practical and field tests allowed Forster's R&D department to calculate the expected useful life of the new system.**

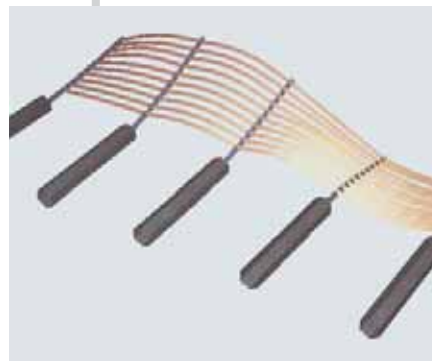
pecially developed simulation software, we can map all requirement profiles, including those for

high-speed train routes. Both the static and dynamic design loads used comply with the most recent requirements.

## Standards and regulations

The noise control elements comply with the following standards and regulations:

- ZTV - ISW 88
- DS 800.2001 (Deutsche Bahn)
- EN ISO 9001:2000
- EN 1793 and 1794
- Fatigue test as per Technische Mitteilung Deutsche Bahn TM 237/2003/007



System map for simulation.

## Pilot project

For the overhaul of the A1 motorway at the Haid-Sattledt section,

the new element SE 11, a type of aluminium of highly absorbent capacity at one side, was already used. In the autumn of 2004, Forster installed fully 11,100 square metres of the novel aluminium noise barriers, 550 square metres of transparent frames, a large gate and 18 emergency exits along a stretch of some 3.6 kilometres, divided into altogether five walls. For the Vienna carriageway the installation of the noise control elements has been completed during summer of 2005. The colour scheme, chosen by Architect Dr. Stefan Lueginger from Linz in cooperation with the Provincial Government of Upper Austria, comprises 14 different colour nuances plus other design features such as signage and symbols.



# A7 Mühlkreis Motorway

## Future-proof noise barrier

The Bindermichl section of the A7, exit and entry point to Linz, the capital of Upper Austria, and junction to the A1 Motorway, is

the quality of living for neighbours by minimising pollution and reducing the noise level by 75%.

bridges themselves, 1,300 m<sup>2</sup> of glass panels were ordered. Our installation crews were confronted with a major challenge: traffic could not be impeded at the site yet all security regulations had to be observed.



### Maximum input

It was a task that taxed all our resources, both humans and machines, and that could be handled only by maximum commitment and perfectly co-ordinated traffic management. Noise barrier panels of a height of up to 10 metres were erected at places exposed to the

used by almost 100,000 vehicles per day. Considering the heavy traffic volume, it was necessary to develop a future-proof solution to traffic-linked problems. The sheer complexity of the problem called for a combination of measures to achieve an improvement of the situation.

The project, involving the encasing and lowering of the city motorway and a range of additional noise control measures, was the largest of its kind in Linz. With this innovative concept it was possible to improve

### Forster Metallbau: a partner for all seasons

ARGE LSW Bindermichl Alpine Mayreder-Strabag entrusted Forster Metallbau with carrying out additional noise protection measures. The order volume comprised more than 6,500 m<sup>2</sup> of noise barriers made of aluminium, positioned along all access roads and exits. The elements placed at the flyovers were secured with ropes. For the



# y – Bindermichl Section

er finished in record time



cent years was finished at a break-neck speed.

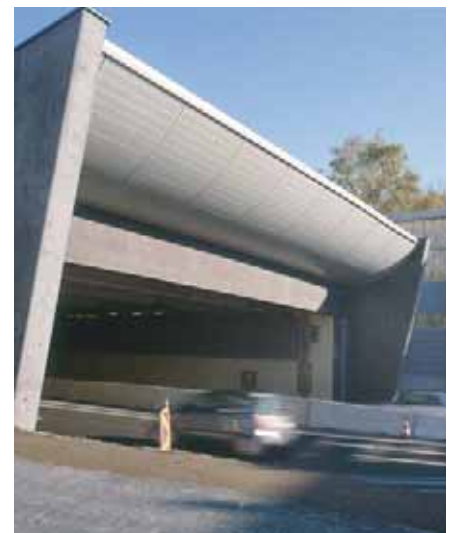
## Silence at last

When the residents of Bindermichl open their windows today, there is no longer any road noise to soil their ears. Having moved 560,000 cubic metres of soil and poured 110,000 cubic metres of concrete, Forster Metallbau has notched up an optimised noise protection project and we can proudly claim that our work was worth the effort. We

winds; 1,700 m<sup>2</sup> of glass elements were combined with aluminium ele-

ments; some 20,000 m<sup>2</sup> of horizontal and vertical panels were fitted to

minimise noise reflections from the concrete surface of the tunnel entrance and exit areas. The deadline was extremely tight because the project naturally had to be completed with all possible speed. Progress was of the whirlwind type: Austria's most expeditious building site was completed three weeks earlier than planned. The most complex road project in Austria of re-



want to thank all our staff, the State of Upper Austria in its capacity of project manager, Asfinag as the principal, ARGE LSW Bindermichl Alpine Mayreder-Strabag and TAS Schreiner for their excellent co-operation.



# A Noise Control Project at the

## Maximum noise screening

Noise is a nuisance. Ever more people complain of the noise from traffic, the consequence of constantly growing traffic volumes. Since our ears are always all eyes and ears, always ready to be insulted by noise, noise control is a critical measure that will audibly improve our quality of living. Forster has recognised the signs of the time and specialised, among other core businesses, in implementing noise control projects.

The transformation of our neighbouring countries and intense cross-border movements translate into a constant growth of traffic on the A22. The motorway is further bur-

dened by the high population growth at the boundaries of Vienna. The need to enlarge the motorway was inescapable, and a key part of the large-scale project was provisions for better noise protection.

zonal strata, starting out with dark blue at the bottom, fading upwards into light blue and dominated by white at the top. White was selected for the upper ream because it optically lowers the height of the barrier.

### Softfooted

Forster obtained the contract for the aluminium noise barriers because it could offer the requisite know-how and optimised project handling. The scope of the contract included the delivery and installation of 13,000 m<sup>2</sup> of aluminium panels and some 700 m<sup>2</sup> of acrylic glass panels for the bridges. With the A22 located between the riverine forest along the Danube and the densely settled area to the north, the idea was born to put the best possible noise barrier in place. The object was to harmonise the wall with its natural surrounding. To this end, it was structured into hori-

### Emulating nature

The blue notes were copied straight from nature – with the (occasionally) blue Danube donating the idea. The elements were designed with “waves” foremost in mind. They can be found on all segments. Whether it is the undulating arrangement of the coloured aluminium panels or the curved and arched noise barriers with their highly absorbent surface – the intricate mix of design features provides for an attractive appearance. The curved wall can be found in the first section between the eastern and western exits of Korneuburg.

### An abundance of know-how

In the A22 project, Forster once again invested all its professional know-how, demonstrating that years



# The A22 Korneuburg East/West from a curved noise barrier

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of experience will pay. As a reliable partner, Forster knows how important it is to translate the client's ideas into a professional concept and implement it on site. When it

comes to noise control Forster knows the importance of a future-proof perspective and uses all its capacities to find a solution for every challenge. Forster has the in-

ternational experience and know-how that guarantees competence from the first contact to the finished noise control project.



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