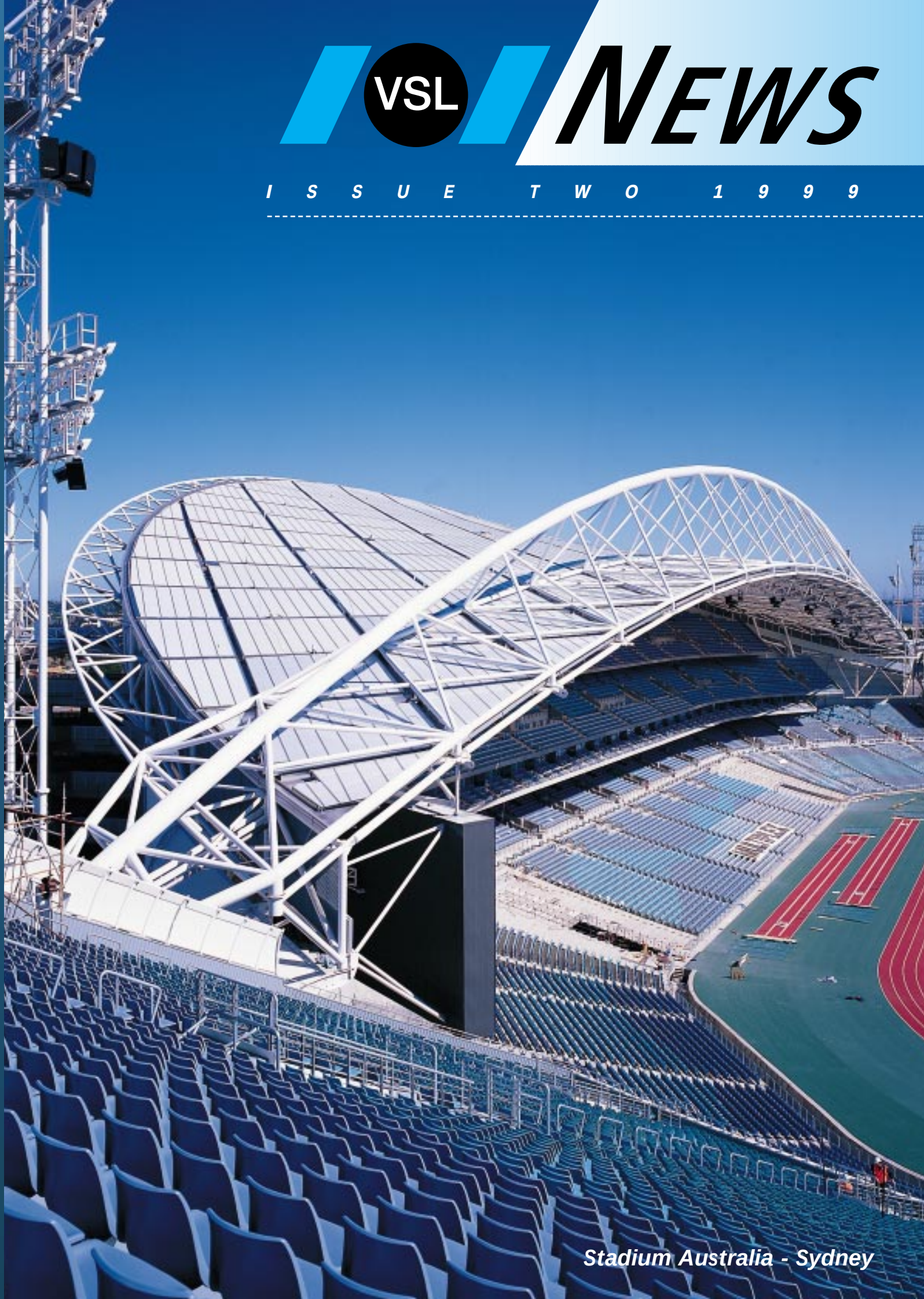
VSL NEWS

ISSUE TWO 1999



Stadium Australia - Sydney

Creating Solutions Together

EDITORIAL

Together, let's create solutions

A year ago, the VSL Group decided to set out its short and medium term strategies, basing its approach on the Group's network and the talents of its staff.

We have a unique world-wide network of 35 subsidiaries established in more than 40 countries. Thanks to our modern communication tools, Internet and Intranet sites, when customers deal with our companies, they are in fact given access to the entire Group's know-how and expertise.

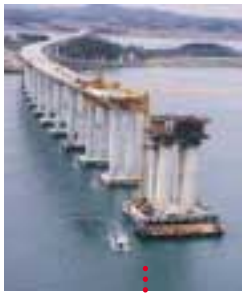
Our companies are managed by local entrepreneurs who have an in-depth understanding of their local economic and political environments. They are able to provide the proximity services you require at the moment you need them.

The combination of this extensive international network and our talented local representatives, most of whom are qualified engineers and technicians, represents the environment you need to successfully develop your business.

Allow me to wish you all a very prosperous and happy New Year.

Alain Le Pivert
CEO and Chairman of the Board

HIGHLIGHTS



P U B L I S H E D B Y

VSL International Ltd.
Bernstrasse 9, 3421 Lyssach
Switzerland
and
VSL Management
41, avenue du Centre
78067 St-Quentin-en-Yvelines
France

Editor: ***A. Le Pivert***
Tel: +33 1 30 12 09 30

Technical Editor: ***H. R. Ganz***
Tel: +33 1 30 12 09 30

Regional Editors:

G. Pash - Australia and Pacific
Tel: +61 2 9484 59 44

J-P. Trin - South East Asia
Tel: +33 1 30 12 09 42

A. Payne - North East Asia
Tel: +852 2590 22 22

H. Wlodkowski - Central East Europe and Middle East
Tel: +41 34 447 99 11

P. Bron - Western Europe, Africa and Latin America
Tel: +33 1 69 19 43 00

Co-ordination:
S. Alezrah
Tel: +33 1 30 12 09 41

Design:
Red Line
Tel: +33 1 41 14 01 80

Linguistic Consultant:
N. Hargreaves
Tel: +33 1 43 66 88 05

- KOREA -

SUNGSAN BRIDGE N°1

Sungsan Bridge project under construction

As part of Government's Expressway Widening Programme between Wonju (northern inland city) and Kangreung (eastern coastal city), several free cantilever bridges are currently under construction in a mountainous area for the Korea Highway Corporation. VSL Korea is building one of these, the Sungsan Bridge N°1, for the main contractor, Daelim Construction Co. The total length of the bridge is 475 m (4 x 50 m + 77.5 m + 120 m + 77.5 m), and precast box heights vary from 2.7 m to 6.5 m with 12.3 m and 14.4 m widths in each direction.

VSL's scope of works includes the supply and installation of 629 t of 0.6" strands and 21 t of 38-mm diameter stressbars, the concreting and re-bar works for the superstructure and the supply and operation of two pairs of 180-t formtravellers.

Works began in February 1998 and will be completed in July 2001. ■

J.K Lee
VSL Korea

- JAPAN -

2-SPAN CONTINUOUS EXTRA-DOSED PRESTRESSED CONCRETE BRIDGE

This railroad bridge located in Sapporo City in Hokkaido, one of the largest northern islands in the Japanese archipelago, has been completed in December 1999 after 27 months of work. This 111-m long bridge, owned by Hokkaido Passengers Railway Co. Ltd, was built by Taisei Corporation, which sub-contracted the launching operation to VSL.
The block units for the main girders were cast on the viaduct alongside this bridge. Once attached, the girders were launched over the existing national roads and motorways. Nose girders were installed during the launching operation, and temporary stays and external tendons stressed using the 9.9-m height pylon.
Some of the permanent stays were stressed to reduce the overall tension in the main girders. ■

Toshimitsu Hirabe
VSL Japan

Launching of the bridge girders

- SWE

Uddevalla Stay Cable Br

Erection of 120 stay cables (22 to 77 strands) for the Uddevalla Cable-Stayed Bridge

The Uddevalla Project is a 9-km link allowing the main traffic along Sweden's western coast (E6 Motorway) to flow freely without being diverted around the bay and through the city of Uddevalla, 70 km North of Göteborg.

This large cable-stayed bridge has a 414-m main span and a 23.30-m wide deck and comprises 120 stay cables divided into two rows of 30 stays for each pylon.

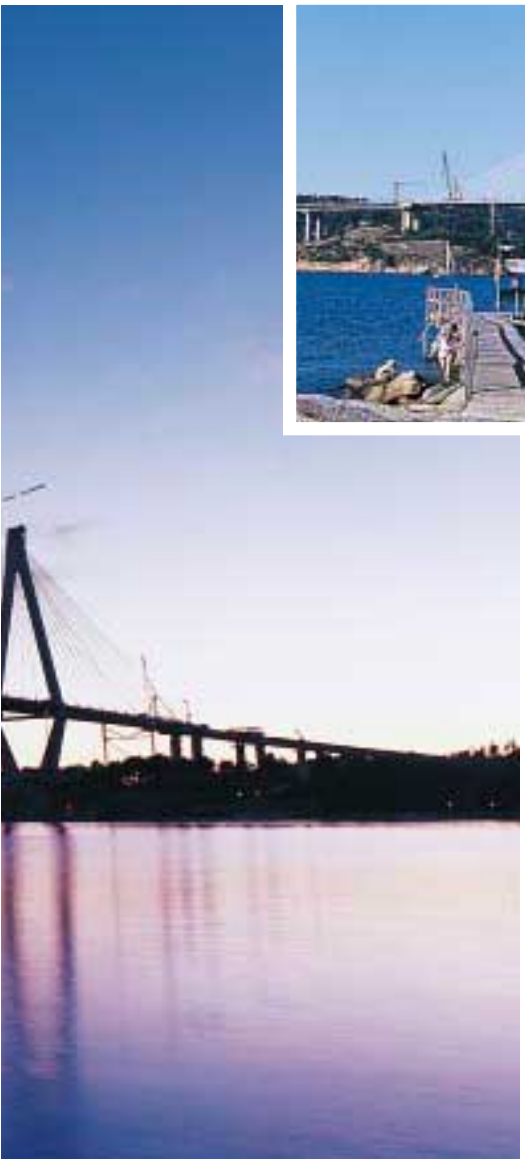
The pylon height above water level is 149.5 m and height of the deck above sea level at mid-span is around 50 m. Other main quantities for the bridge are as follows: 35,000 m^3 of concrete, 9,000 t of structural steel, 6,000 t of reinforcement steel and 1,100 t of galvanised sheathed strands.

In September 1997, the main contractor, Skanska, awarded our Special Projects Department (WEALA S.P.P), via VSL France grouped with VSL local licensee ISAB, the subcontract for designing, supplying and erecting the 120 stays, ranging from 22 to 77 strands. The subcontract (5 M USD) was signed by ISAB in April 1998. VSL's part amounted to 3 M USD, and VSL's Site Manager was Francis Crozat.

VSL proposed an individual strand installation method for this project.

DEN -

idge nearing completion



In addition to supplying HDPE sheathed, greased and galvanised strands, VSL's scope of works and services included the design of simplified components for anchorages, the testing and supply of anchorages, the development of complete methodology for individual strand installation and the supply of specially designed mono-jack for stressing, as well as technical assistance to ISAB employees.

As the works had nearly begun, VSL was instructed to design and develop adaptations to its system so that friction dampers could be fixed to each stay. Later, instructions were received to manufacture these friction dampers which had been extensively studied and patented by VSL and a German consultant.

Since the first stay erection at Christmas 1998, the project has gone forward very smoothly, despite a few delays in the construction of the pylon foundations and, by mid-October 1999, only 12 stays remained to be erected.

The friction dampers will be installed as from January 2000. The overall project should be completed by spring 2000. ■

Jean-François Cubillé
VSL France

A strand-by-strand installation method

- SPAIN -

CTT Stronghold package for three High Speed Railway viaduct segments

The Spanish High Speed Railway, linking Madrid to the French border, is now under construction from Madrid to Lleida. CTT Stronghold has already supplied its services and/or products for several sections out of the thirty already projected or under construction. One of them, section IV, located between Zaragoza and Lleida, comprises three main viaducts assembled using the incremental launching method. The lengths of these viaducts are respectively 441 m (28 + 11 x 35 + 28), 371 m (28 + 9 x 35 + 28) and 406 m (28 + 10 x 35 + 28) for an overall length of 1,218 m. During launching, 1,200-t capacity temporary and permanent pot bearings were used on piers and end abutment.

Overall view of High Speed Train viaduct

Pot bearing for incremental bridge launching

The half-span length segments were cast in the precasting yard prior to stressing using 6-9 and 6-15 parallel tendons and CTT couplers. They were then launched using lifting/shifting jacks placed on the abutment. On completion of the launching, and after removing the sliding pads and the stainless steel from the pot bearing top plate, 6-19 parallel tendons were then threaded and stressed.

In addition to supplying pot bearings, lateral guides, launching jacks and sliding pads, CTT Stronghold carried out the PT works and the launching operation, as well as providing technical assistance to the main contractor. ■

Erique Alonso
CTT Stronghold

- USA -

Logan Airport / I-90 Interchange, Boston

This viaduct superstructure replacing the airport arrival and departure ramps is part of Boston's multi-billion dollar project to revitalise the city's outdated roadways. The airport, as well as the rest of the city, is maintaining full service throughout the length of the project. The viaduct is a cast-in-place box girder consisting of over 50 spans, both curved and straight. The segments vary in size and span lengths of up to 60 m and widths of up to 24 m. Tendon lengths over 150 m are used to stress sections of the viaduct.

VSL's involvement comprises the supply and installation of all post-tensioning systems. These include longitudinal and transverse 0.5"-diameter tendons of 12, 19, 31, 43 and 55-strands and 5-strand flat duct tendons for the roadway deck. There are over 835 t of strands within the structure.

VSL has provided a cost saving alternative by using 0.5"-diameter instead of 0.6"-diameter strands, increasing tendon sizes and using 55-strand tendons.
VSL has creatively solved the challenges of a cast-in-place structure, such as narrow clearances for stressing operations.

Logan Airport I-90 interchange under construction

The project, currently with over half the spans finished, is expected to be completed before autumn 2000. ■

Gregory Hunsicker
VStructural Llc

- SWITZERLAND -

The "Schlund" Elevated Roundabout, Hown-Lucerne

As well as carrying out the post-tensioning works for this unusual structure, VSL Switzerland is also providing technical assistance during the design phase to the Engineers, Plüss & Meyer.

This elevated roundabout serves as a connector to the A2 North-South National Highway. With an inner diameter of 34 m and an outer diameter of 56 m, the ring structure connects seven traffic arms at approximately 5 m above ground level. VSL will supply and install 6-7 and 6-12 cable units totalling 60 t of prestressing steel strands. ■

Franz Fischli
and Mario Bevilacqua
VSL Switzerland

Aerial view of the elevated "Schlung" roundabout

HEAVY LIFTING

- USA -

Lifting the main girders for a new portal crane in Kvaerner shipyard, Philadelphia

The new portal crane for the Kvaerner shipyard in Philadelphia was designed and fabricated in Portugal by Mague EM S.A. and erected by Cornell & Company, Inc which awarded VSL the alternative heavy lifting works.
The crane legs were assembled using a large mobile crane.

VSL lifted the main box girders with crane crabs using a hydraulic strand lifting system. The lifting equipment was placed on temporary steel beams fixed to the tops of the legs.
The lifting force on the shear leg had to be balanced by system of tie-back cables and jacks.

VSL also provided guy wire cables and equipment to stabilise and adjust the legs until all welding connections were completed.
The lifting of the main girders took place in September 1999. ■

Ferdinand Trenkler
VSL Switzerland

- AUST

VSL at Sydney

The 110,000-seat Stadium Australia will host major athletic events for the 2000 Olympic Games

RALIA -

Olympic Games

When the Sydney Olympic Games open on the 15th September 2000, the 240 employees of VSL Australia will have earned a gold medal.

VSL has made a significant contribution to the construction of Olympics related projects at the Homebush Bay site.

Prior to the announcement that Sydney was the Host City, VSL was involved with the Athletics Stadium and the Aquatic Centre. Following the emotional announcement from Juan Antonio Samaranch that Sydney was hosting the Olympic Games, construction at the Homebush Site began in earnest.

Stadium Australia
VSL commenced on site during December 1996 at Stadium Australia, the major Olympics Stadium which will host among other events the opening and closing ceremonies of the Games as well as the major athletic events. VSL was responsible for all the PT works including the core, circular ramps and the design and construction of the lower tier seating. The lower tier seats (50,000) represent 45% of Stadium Australia's overall 110,000 seating capacity.

A major achievement at the Stadium was the design of the moving system

for the lower tier stands which, once the Games are over, will make it possible to reconfigure the Stadium for other sporting or cultural events (refer to box). Following the Olympic and Paralympic Games, VSL looks forward to assisting with the reconfiguration of Stadium Australia.

Sydney Superdome
VSL also carried out the post-tensioning for the Sydney Superdome, an enclosed stadium with a seating capacity of 20,000. This venue will feature the basketball and gymnastics during the Olympics and boasts an attached 3,500 space multi-level carpark (the largest carpark in Australia).

Haslam's Creek Bridge
Other major projects to which we contributed on the Olympics Site included the post-tensioning and incremental launching of the 150-m long Haslam's Creek Bridge. This provides the main link to the Olympic Boulevard from the West over sensitive mangrove wetlands, the habitat of an endangered frog species.

Multi-level Carpark and Sydney Showground Administration Building
VSL was also involved in the post-tensioning of the multi-level carpark, (1,450 car spaces) at the eastern end of the site and the design and construction of the post-tensioned slabs for the Sydney Showground Administration Building.

VSL Prestressing (Aust) Pty Ltd was presented an "Award of Excellence" by The Concrete Institute of Australia for all its works on Stadium Australia. ■

Ross Ioakim
VSL Australia

Post-tensioning of Sydney Superdome, Australia's largest venue

VSL's contribution to the Olympic Games Site

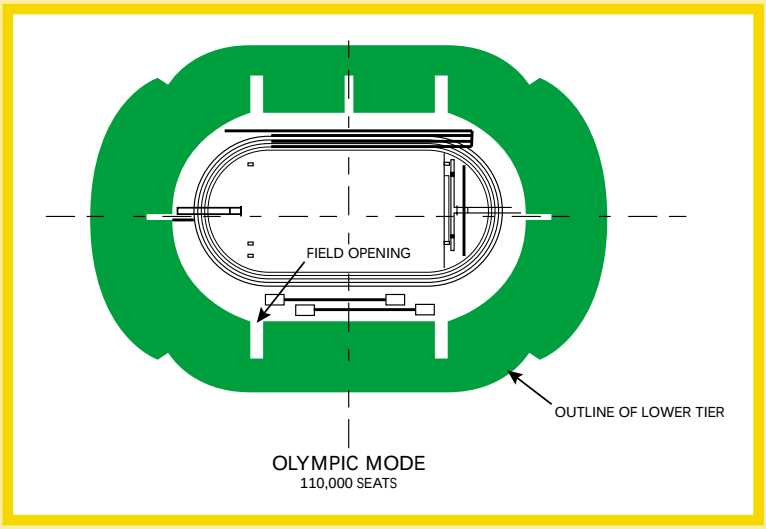
Stadium Australia – lower tier seating moving

The design and construction of the lower tier seating deck (50,000 seats) is both innovative and the result of lateral thinking. The requirement that the designers provide a reconfigurable structure able to accommodate different shaped sports grounds (rectangular for Rugby and Soccer to oval for Australian Rules Football) has resulted in a world first.

The lower tiers to the East and West stands are constructed from post-tensioned cast in-situ concrete on steel columns.
The post-Olympics conversion, reducing the capacity of Stadium Australia from 110,000 to 80,000 spectators, calls for a reconfiguration into two distinct "Rugby" and "AFL" (Australian Football) modes within an eight-hour window.

Rugby mode:
The Rugby mode, i.e. conversion to a rectangular pitch, involves the following operations:

- *relocating the straight portions of eastern and western sides of the tier (100-m long, and 31-m wide) 15.6 m closer to the centre of the pitch;*
- *demolishing portals in each of the four corners;*



- *relocating the curved portions of the northern and southern end 15.6 m closer to the centre of the pitch (this is a once only move).*

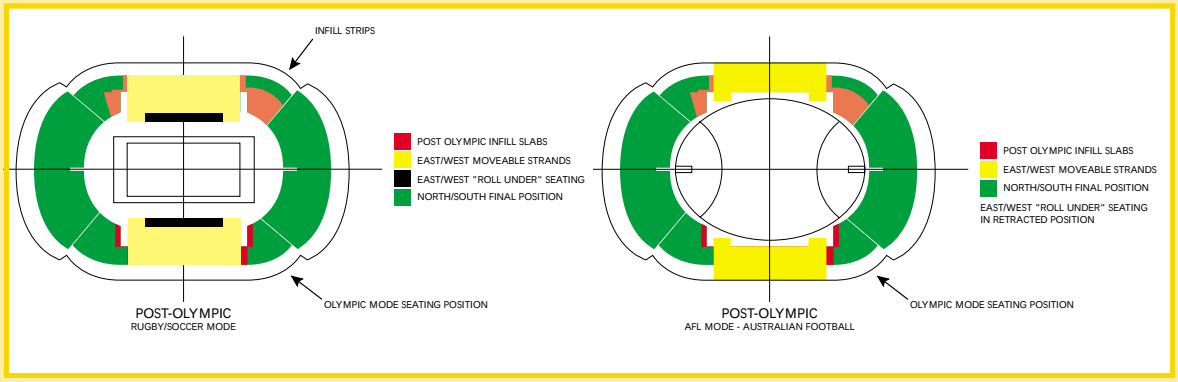
AFL mode:
The AFL mode, i.e. conversion of the rectangular pitch to oval shape: the East and West stands move back 15.6 m to the main Olympic mode position, then the front nine rows drop down and retract beneath the structure of the seating deck.

Installation of the moving system will take place post-Olympics, and feature the following:

- *electronically driven, high load capacity wheel set on rails;*
- *one driving bogie per 7.6 m grid;*
- *synchronised drive motor;*
- *velocity, 1 m per second.*

The electrical driving system enables the lower tier to assume its new position in 15 minutes. The eight-hour window includes all preparatory and post movement operations required to make the Stadium ready and safe for incoming spectators.
Stadium Australia's lower tier seating will house 45% of the Stadium's capacity during the Olympics and 60% in the dramatically rearranged post-Olympics format. The innovation displayed during its design and construction will prove an enormous legacy for Sydney. Spectators will enjoy world's best viewing, all from one structure and with two different shapes of playing fields, at the push of a button. ■

Michael Brown
VSL Australia



- PHILIPPINES -
RCBC Towers

This 42 and 47-storey twin tower project is owned by one of the top five corporations in Philippines' banking industry, Rizal Commercial Banking Corporation (RCBC).

It features the latest condominium building design technology and stands in the heart of Metro Manila's financial hub, Makati City. The main contractor is a joint venture formed from EEI Corporation, Concrete Construction Corporation and Walter Bau Philippines.

VSL was awarded the supply and installation of PT systems for 2,340 beams, with average spans and widths of 12 m and 0.80 m respectively. Thanks to ECW / VSL's approved alternative design, the works gained sixty days on the schedule with a cycle time of 7.5 days per floor for a total floor area of 128,288 m². Over 294 t of VSL 12.7-mm flat slab system were installed.

The project began in August 1998 and is scheduled for completion in January 2000. ■

VSL Philippines
Michael Phillips

RCBC Twin Towers in Makati Business District

- AUSTRALIA -
Mincom Central Commercial Development

This 9-storey commercial development project is located in Brisbane's central business district. The structure is being built over the existing interstate and city railway lines as they exit from the city's two major tunnels. The building was therefore designed to straddle the existing rail track infrastructure.

This was achieved by providing seven major transfer beams to transfer column loads across the rail track allowing the strategic positioning of foundations around the tracks.

VSL carried out multistrand post-tensioning to the transfer beams. The beams span up to 28 m and are generally one storey deep. The largest is 6 m deep and was post-tensioned using six 31-strand 15.2-mm tendons.

This beam was cast in three times to offset plastic settlement and hydration heat effects of the concrete.

All beams are staged stressed as dead load is added to the structure.

Careful attention to design and construction methodology by the consultants, Connell Wagner and builder Watpac Australia Pty Ltd, successfully ensured a "stress-free" installation and the stressing of the transfer beam, despite the complexity of the structure. ■

Bruce Neels
VSL Australia

Optimised formwork design and operation in the building industry can lead to considerable time and cost savings. VSL Climbform has become the most sophisticated self-climbing vertical formwork system used in the Building and Construction sector and is particularly well adapted to the construction of high-rise building cores. Users appreciate the unobstructed access to formwork for reinforcing, cleaning, oiling, placing and positioning blockouts, as well as the competitive cycle times.

VSL Philamlife Tower - Philippines

VSL also provides specific formwork system packages that are fully adapted to particular markets, such as Mivan and Climbfloor systems. Some recent projects using these technologies are presented below.

Gateway Two Complex - Hong Kong

The VSL formwork system service package includes feasibility studies, tender design and pricing, final design, manufacture and supply of equipment, leasing of VSL equipment, training of site staff and supervision.

- FRANCE -

Cœur Défense Twin Towers

A challenging break-through for VSL Climbform in Europe

The "Cœur Défense" twin towers are located on the site previously occupied by Esso Headquarters in "La Défense", the Paris business district. They have a total floor area of 353,000 m², including 163,000 m² of office floor area.

The total contract value of the project for the main contractor Bouygues Bâtiment represents 2.3 billion FF. The main challenge was to complete the entire project within an extremely tight 29-month schedule.

The high density of buildings around the site severely limited the number of tower cranes that could be used (10) and, as a result, when Bouygues Bâtiment looked at how to build the core walls, it decided to concentrate on the use of a self-climbing formwork solution.

A four-day per-level cycle was achieved using VSL Climbform.

Despite very tough competition, VSL France was awarded a 9-million FF turnkey contract in February 1999 for supplying, erecting, modifying where required and dismantling the VSL Climbform system for the core walls. The core walls to be formed are assembled from four different sections comprising 39 levels of 3.6-m height each. The formed area for the lower levels represents 3,600 m² for 250 linear meters of walls.

The challenge facing VSL was the first time use of its Climbform system on such a major European project.

The Group's approach was to bring in the expertise of a number of VSL entities, such as VSL France, VSL Hong Kong and VSL Australia. The time schedule was also a challenge as VSL had less than three months between the order being placed and the erection of 1,800 m² of formwork, with the additional problem of not being authorised to flame-cut any components on site.

VSL France also had to design alternative yokes and invest in telescopic jacks. The use of retractable yoke system allows the main contractor to speed up the cycle by installing prefabricated steel cages.

While employing a chief engineer and a draftsman from VSL Australia and Hong Kong to finalise concepts, general arrangements and a number of shop drawings, VSL France also mobilised a team of ten people to complete the shop drawings and all specific adaptations to meet the extraordinarily tight deadline. No less than 200 drawings were issued.

The total weight of designed and manufactured steel structures for the project is approximately 600 t. The Climbform system used 24 telescopic jacks, each with a 28-t maximum capacity. Although two VSL Australia supervisors were sent to train French local teams for the erection of the forms, the completion of the erection phase was fully carried out under the supervision of trained French foremen.

Much to the client's satisfaction, the projected four-day cycle time per level was achieved almost immediately. VSL expects to have finished its works by March 2000 and the overall project will be completed in 2001. ■

Bertrand Roth
VSL France

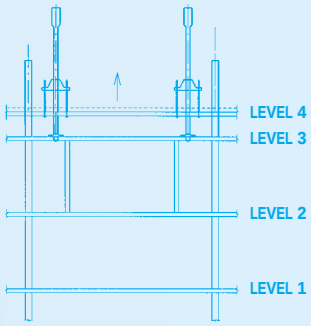
La Défense Business District

- AUSTRALIA / NEW ZEALAND -

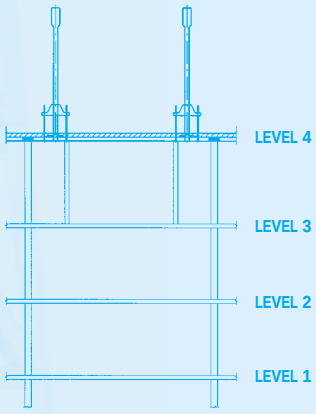
VSL CLIMBFLOOR, A NEW BUILDING TECHNOLOGY

VSL Climbfloor is a multi-point synchronised slab lifting system that, like the Climbform system, uses the self-climbing principle but applies it to the construction of in-situ, post-tensioned slabs. This means floor slabs can be poured on site, tensioned, then mechanically lifted into position. Climbfloor then climbs itself to a new level, another floor slab is poured on top of the first and is lifted into position and so on.

This new building technology, currently applied for the construction of New Zealand's tallest commercial office tower, The Royal Sun Alliance Centre, offers significant cost and time savings for high rise floor construction. Among its numerous advantages, Climbfloor provides high quality floor slab that requires no soffit formwork and associated labour cost, reduces site cranage and allows faster production and greater flexibility and safety compared to traditional formwork systems.



1. Stress tendons in floor to be lifted at level of floor below.
2. Lift floor to final level.



3. Pour high strength concrete to infills of columns.
4. Next day, climb the jacks and backprops.
5. Pour concrete for the next floor.

VSL Climbfloor in progress on The Royal Sun Alliance Centre

The Royal Sun Alliance Centre, *Auckland*

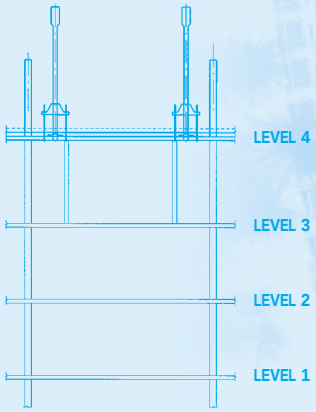
This 34-storey office tower on a 6-storey podium is nearing completion in downtown Auckland. VSL's scope of works was the design, supply and supervision of commissioning of the Climbfloor for the main contractor Fletcher Construction, continuing VSL's excellent relationship originally established on the monumental Auckland Sky Tower.

Features of the Climbform included:
- forming of external corbel to support precast flooring;
- lift out hatches to enable installation of precast stairs;
- support of concrete placing booms.

The 150-m high core was completed in June 1999 after 40 pours totalling 19,100 m² of formed area. ■

Brad Hannan
VSL Australia

Climbfloor simplified construction sequence



6. Set up and pour the columns.
7. Install post-tensioning, reinforcement and services for the next floor.
8. Repeat the sequence.

The jack unit comprises a free-standing column supported off the floor below. A central lifting yoke is attached to the slab within hanger bars. The yoke itself is connected to a precision screw, rotated by an electric motor that raises the slabs. The electric motor drives are linked to a central laptop computer, which monitors the lifting system.

- HONG KONG -

MIVAN SYSTEM FORMWORK

One the basis of past experience with formwork systems such as the VSL Climbform system, formtravellers and flying table forms, VSL Hong Kong has applied its expertise to promote and provide a new formwork system to cater to Hong Kong's public and private residential market.

Mivan System Formwork uses aluminium panels that connect together to form a mould into which concrete is poured. When the mould is removed, the result is a high quality concrete finish to accurate tolerances and verticality.

The formwork can be used for straightforward applications (floor slabs) or more complicated structures (bay windows, A/C hoods and stairs) and has been used successfully on a large number of low and high rise projects around Asia.

Quick Strip Prop Head

Government Housing Blocks

The formwork, designed to suit most types of architectural layouts, uses software that chooses the most economical panel sizes. These standard panels represent approximately 80% of the total formwork area and can be redesigned and adapted to subsequent projects, thus maximising re-use. Unlike other similar systems, Mivan formwork incorporates 100% of the formed area, totally eliminating the need for traditional formwork infill pieces.

The system uses a high strength aluminium alloy with a 4-mm thick skin plate and a 6-mm thick ribbing behind to stiffen the panels.
The panels are manufactured within a factory environment and, once assembled, are generally subjected to a trial erection to eliminate any dimensional or on-site problems.
The panels are clearly labelled in the factory to ensure that they are easily identifiable on site and can be smoothly fitted together using the formwork modulation drawings.

The panels are held in position by a simple pin and wedge system that passes through holes in the outside rib of each panel. The labour force does not require tape measures or saws as there is absolutely no need for on-site cutting and once the panels have been numbered, measuring becomes redundant.

Tsueng Kwan O Development Area 55

Lee On Road Trial Assembly

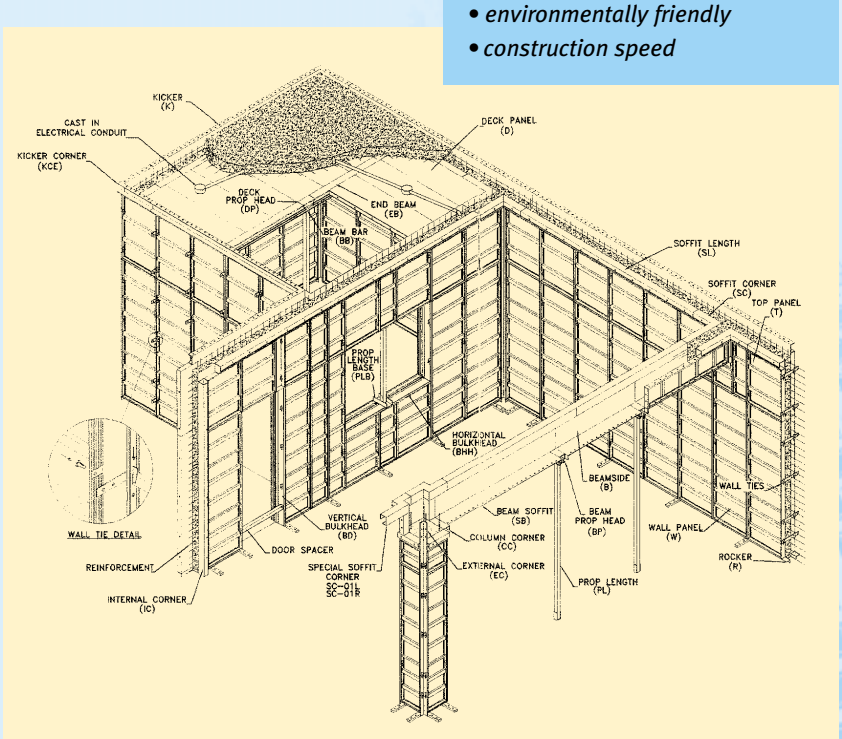
Advantages of Mivan System Formwork:

- *high finish quality*
- *good alignment and verticality*
- *no tower crane*
- *unskilled labour force*
- *reduced materials handling*
- *undisturbed propping*
- *environmentally friendly*
- *construction speed*

The simplicity of the Mivan System means that unskilled labour can be used, taking off the pressure from the small skilled labour pool.

The cycle is not dissimilar to that of traditional formwork, but because of the repetitive nature of the process, it is possible to accurately programme construction sequences and thus cycle times well in advance.
As this is a manual erection system, tower cranes are freed up and can concentrate on other handling operations. The result is a typical 4 to 5-day cycle for floor-to-floor construction.

The key technical feature that allows this speed to be attained and maintained using a single set of formwork panels is the unique V-shaped prop head system which allows the “quick strip” to take place while leaving the propping undisturbed. The deck panels can therefore be immediately reused with the addition of extra sets of props. As all the props are positioned identically from floor-to-floor, construction loadings can be transferred to full strength slabs or beams as required by the specifications.



The high tolerance level of the formwork finish means that no plastering is required. In addition, because door openings and windows are formed in position with a high degree of squareness, raw opening sizes can be reduced.
Typically a 3-mm to 4-mm skim coat is applied internally prior to finishing and a 6-mm build-up coat prior to laying tiles.

VSL Hong Kong has supplied 35,000 m² of Mivan formwork for height projects representing 23 blocks over the last 3 years. The Manhattan Heights project was recently completed on a typical 4-day cycle over the buildings 50-storey height. ■

Stuart Pearson
VSL Hong Kong

- CZECH REPUBLIC -

VSL AT THE '99 FIB SYMPOSIUM

VSL was the main sponsor for the '99 FIB Symposium which took place mid-October in Prague, Czech Republic. This international prestressing and concrete conference attracted over 550 delegates from across the world. There were many papers presented and over 140 published, and 22 companies exhibited their products and services.

VSL had one of the best stands, staffed by VSL Management as well as by VSL personnel from the Czech Republic, Switzerland, Poland and France. The focus of exhibit was undoubtedly the samples from the newly presented wide range of bar products. There were two VSL papers presented, one concerning the Vistula River Bridge in Poland, and the other one on friction dampers for stay cable bridges.

The highlight of VSL's presence was the already traditional VSL Cocktail Party which brought together nearly 100 invited guests from many different countries. They were greeted by the local PC Manager, Miroslav Vejvoda, and were given an overview of the VSL values and activities by Alain Le Pivert, the Group CEO.

VSL Stand at the '99 FIB Symposium in Prague

Afterwards, the discussions continued well beyond the official end of the party, revealing the interest shown by our present and future business partners. It is now up to us to build on these relationships... ■

Miroslav Vejvoda
VSL Czech Republic

- VSL IN KOREA -

GRAND PRIX AWARDED TO A KOREAN SUBCONTRACTOR

Since its creation in 1982, VSL Korea Co. Ltd. has grown not only as a post-tensioning leader in its country but also as the first Korean ranking subcontractor in the field of reinforced concrete structures. Its efforts have been rewarded by winning the Grand Prix in the construction industry category.

High Speed Rail Section 5-2 constructed with movable scaffolding

Starting with only three staff members in 1982, VSL Korea carried out its first small span bridge project, Young-Dong Bridge #1, in 1983. Currently, VSL Korea, with 195 employees, is working on more than 20 major bridge projects, using various construction methods such as free-cantilevering, incremental launching and movable scaffolding.

VSL Korea is also involved in large-scale building projects, special structure constructions such as silos, treatment plants and test-beds, as well as repair/strengthening works.

Seo Hae Grand Free Cantilever Bridge

Jang Pyung Incrementally Launched Bridge

the day it won the Grand Prix Award in the construction industry category.

The prize was created as part of the Korean construction industry's 50th anniversary. VSL Korea and Hyundai Engineering & Construction were the only winners among thousands of construction companies. The prize was given to Mr. H-W Shin, VSL Korea PC Manager, by the chairman of Korea Federations of General & Specialised Construction Companies under the sponsorship of Ministry of Construction and Transportation (MOCT). The ceremony was held at the Ramada Renaissance Hotel, and the dignitaries attending included the Minister of MOCT, the president of Korea Housing Corporation, and three Congressmen.

This occasion was covered by all major newspapers and treated as highlighted news in the business section. ■

J.K Lee
VSL Korea

VSL Korea is also involved in re-bar manufacturing, formwork operations and concreting.
Its 1999 annual turnover is expected to be 60 million US dollars.

Thanks to its corporate vision based on a very stringent quality policy, VSL Korea was awarded ISO 9001 certification in 1997. Since then, its quality approach has been maintained in every field of the company's operations through six-monthly quality audits.

October 20, 1999 was a very special occasion for VSL Korea, as this was

Ku Ryang Chon Free Cantilever Bridge

Your solution network

HEADQUARTERS
VSL International Ltd.
Bernstrasse 9 - LYSSACH - CH 3421 - Switzerland
Phone: 41 - 34 - 447 99 11 - Fax: 41 - 34 - 445 43 22
http:\\www.vsl-intl.com

Australia / Pacific territories

REGIONAL OFFICE
VSL Prestressing (Aust.) Pty. Ltd.
6 Pioneer Avenue
THORNLEIGH, NSW 2120
AUSTRALIA
Phone: +61 - 2 - 9484 59 44
Fax: +61 - 2 - 9875 38 94

AUSTRALIA - Queensland
VSL Prestressing (Aust.) Pty. Ltd.
GEEBUNG
Phone: +61 - 7 - 326 564 00
Fax: +61 - 7 - 326 575 34

AUSTRALIA - New South Wales
VSL Prestressing (Aust.) Pty. Ltd.
THORNLEIGH
Phone: +61 - 2 - 948 459 44
Fax: +61 - 2 - 987 538 94

AUSTRALIA - Southern Division
VSL Prestressing (Aust.) Pty. Ltd.
NOBLE PARK
Phone: +61 - 3 - 979 503 66
Fax: +61 - 3 - 979 505 47

GUAM
Structural Technologies Inc.
TUMON
Phone: +67 - 1 - 646 80 10
Fax: +67 - 1 - 646 80 60

North America

LB Foster Cy.
SAN DIEGO, CA
Phone: +1 - 619 - 688 - 2400
Fax: +1 - 619 - 688 - 2499

VStructural Llc. Regional Office
BALTIMORE, MD
Phone: +1 - 410 - 850 - 7000
Fax: +1 - 410 - 850 - 4111

DALLAS, TX
VStructural Llc.
Phone: +1 - 972 - 647 - 0200
Fax: +1 - 972 - 641 - 1192

DENVER, CO
VStructural Llc.
Phone: +1 - 303 - 456 - 9887
Fax: +1 - 303 - 456 - 9796

WASHINGTON D.C, VA
VStructural Llc.
Phone: +1 - 703 - 451 - 4300
Fax: +1 - 703 - 451 - 0862

France

VSL France S.A.
EGLY
Phone: +33 - 1 - 69 26 14 00
Fax: +33 - 1 - 60 83 89 95

South East Asia

REGIONAL OFFICE
VSL Singapore Pte. Ltd.
75 Bukit Timah Road
04-08 Boon Siew Building
Singapore 229833
SINGAPORE
Phone: +65 - 336 29 23
Fax: +65 - 337 64 61

BRUNEI
VSL Systems (B) Sdn. Bhd.
BRUNEI DARUSSALAM
Phone: +673 - 2 - 380 153
- 381 827
Fax: +673 - 2 - 381 954

INDIA
VSL India Representative Office
CHENNAI
Phone: +91 - 44 859 2538 / 39
Fax: +91 - 44 859 2537

INDONESIA
PT VSL Indonesia
JAKARTA
Phone: +62 - 21 - 570 07 86
Fax: +62 - 21 - 573 12 17

MALAYSIA
VSL Engineers (M) Sdn. Bhd.
KUALA LUMPUR
Phone: +603 - 242 47 42
Fax: +603 - 242 93 97

SINGAPORE
VSL Singapore Pte. Ltd.
SINGAPORE
Phone: +65 - 336 29 23
Fax: +65 - 337 64 61

THAILAND
VSL (Thailand) Co. Ltd.
BANGKOK
Phone: +66 - 2 - 237 32 88/89/90
Fax: +66 - 2 - 238 24 48

North East Asia

REGIONAL OFFICE
VSL North East Asia
3/F Stelux House
698 Prince Edward Road East
San Po Kong / Kowloon
HONG KONG
Phone: +852 - 2590 22 22
Fax: +852 - 2590 95 93

HONG KONG
VSL Hong Kong Ltd.
San Po Kong / Kowloon
Phone: +852 - 2590 22 88
Fax: +852 - 2590 02 90

JAPAN
VSL Japan Corporation
TOKYO
Phone: +81 - 3 - 3346 - 8913
Fax: +81 - 3 - 3345 - 9153

KOREA
VSL Korea Co. Ltd.
SEOUL
Phone: +82 - 2 - 553 8200
Fax: +82 - 2 - 553 8255

MAINLAND CHINA
Heifei VSL Engineering Corp. Ltd.
ANHUI PROVINCE
Phone: +86 - 551 - 557 6008
Fax: +86 - 551 - 557 6018

PHILIPPINES
VSL Philippines Inc.
MANDALUAYONG CITY
Phone: +63 - 2 - 638 76 86 / 87
Fax: +63 - 2 - 638 76 91

TAIWAN
VSL Taiwan Limited
TAIPEI
Phone: +886 - 2 - 2759 6819
Fax: +886 - 2 - 2759 6821

VIETNAM
VSL Representative Office
HANOI
Phone: +84 - 4 - 8245 488
Fax: +84 - 4 - 8245 717

Central East Europe and Middle East

REGIONAL OFFICE
VSL (Switzerland) Ltd
Bernstrasse 9
Lyssach - CH 3421
SWITZERLAND
Phone: +41 - 34 - 447 99 11
Fax: +41 - 34 - 447 99 65

AUSTRIA
Universale GSB
VIENNA
Phone: +43 - 1 - 878 170
Fax: +43 - 1 - 878 17 782

CZECH REPUBLIC
VSL Systemy (CZ) s. r. o.
PRAGUE
Phone: +420 - 2 - 67 07 24 20
Fax: +420 - 2 - 67 07 24 06

GERMANY
VSL Systems Gmbh
BERLIN
Phone: +49 - 30 - 53 006 0
Fax: +49 - 30 - 53 546 37

POLAND
VSL Polska Sp. z. o. o.
WARSAW
Phone: +48 - 22 - 817 84 22
Fax: +48 - 22 - 817 83 59

SWITZERLAND
VSL (Switzerland) Ltd.
LYSSACH
Phone: +41 - 34 - 447 99 11
Fax: +41 - 34 - 445 43 22

UNITED ARAB EMIRATES
VSL Middle East Office
DUBAI
Phone: +971 - 4 - 820 803
Fax: +971 - 4 - 829 441

Western Europe, Africa and Latin America

REGIONAL OFFICE
L'Odyssée - Bât. A
2-12 Chemin des Femmes
91886 MASSY Cedex
FRANCE
Phone: +33 - 1 - 69 19 43 00
Fax: +33 - 1 - 69 19 43 01

ARGENTINA
VSL Sistemas Especiales de Construcción Argentina SA
BUENOS AIRES
Phone: +54 - 11 - 4326 06 09
Fax: +54 - 11 - 4326 26 50

BELGIUM
NV Procede VSL SA
HALLE ZOERSEL
Phone: +32 - 3 - 384 11 24
Fax: +32 - 3 - 384 33 31

CHILE
VSL Sistemas Especiales de Construcción SA
SANTIAGO
Phone: +56 - 2 - 233 10 81
Fax: +56 - 2 - 233 67 39

GREAT BRITAIN
VSL Systems (UK) Ltd
BUCKS
Phone: +44 - 1 - 480 860 990
Fax: +44 - 1 - 480 861 092

GREECE
VSL Systems A/E
ATHENS
Phone: +30 - 1 - 363 84 53
Fax: +30 - 1 - 360 95 43

MEXICO
VSL Corporation Mexico S.A de C.V
MEXICO
Phone: +52 - 5 - 341 25 87 / 31 86
Fax: +52 - 5 - 396 84 88

NETHERLANDS
VSL Benelux B.V
AT LEIDEN
Phone: +31 - 71 - 576 89 00
Fax: +31 - 71 - 572 08 86

NORWAY
VSL Norge A/S
STAVANGER
Phone: +46 - 87 - 53 02 50
Fax: +46 - 87 - 53 49 73

PORTUGAL
VSL Sistemas Portugal SA.
S. DOMINGO DE RANA
Phone: +351 - 21 - 445 83 10
Fax: +351 - 21 - 444 63 77

SOUTH AFRICA
VSL Systems South Africa (Pty) Ltd.
KYA SAND
Phone: +27 - 11 - 708 21 00
Fax: +27 - 11 - 708 21 20

SPAIN
CTT Stronghold
BARCELONA
Phone: +34 - 93 - 200 87 11
Fax: +34 - 93 - 209 85 90

SWEDEN
Internordisk Spännarmering AB
DANDERYD
Phone: +46 - 8 - 753 02 50
Fax: +46 - 8 - 753 49 73