Freyssinet supplied and installed the post-tensioning of the slabs for the future Peugeot design centre at Vélizy (France).
PROFILE OF THE GROUP

The Freyssinet group, the leading specialist civil engineering contractor, generated consolidated turnover of

430.5 million euro

Freyssinet, Ménard Soltraitement and Reinforced Earth together form a specialist Structures and Soils Group serving the construction, civil engineering and manufacturing industries through new works, repairs and maintenance.
In 2002, the Group recorded significant turnover growth, but a lower profit figure. The closure or restructuring of loss-making subsidiaries, allied to the introduction in 2002 of a new strategic plan to improve our profitability by focusing on our strengths and taking a more opportunist approach to our markets, should bring us back into profit in 2003. Furthermore, an increase in the subscribed capital of Vinci Construction – a clear mark of its confidence in the Group’s recovery – and the excellent performance of some of our subsidiaries contributed to our substantially improved cash position at 31 December 2002. Those business units that managed to maintain satisfactory profit levels included the Reinforced Earth network: Reinforced Earth USA, Reinforced Earth Canada, Terre Armée France, Terre Armée Holland and Reinforced Earth South Africa. In our Structures Division, Freyssinet France managed to exceed its cash targets. Our Asian subsidiaries also achieved good performance levels despite fierce competition in their markets. The profit generated by Ménard Soltraitement also remained at an excellent level.

Our imperative for 2003 is to return to consolidated profit. To help us achieve this, we can count on many strengths, including a portfolio of patents unique in our activity, our proven technological excellence and a worldwide network of real quality. This network of Freyssinet, Reinforced Earth and Ménard Soltraitement subsidiaries is organised geographically and by divisions (Structures and Soils). This allows individual business units to benefit from global expertise whilst remaining firmly rooted in their own area, country and region to provide local service to their customers. By being selective in the projects they accept, some of them were extremely successful in 2002: take for example, the construction of the cable-stayed bridge over the River Boyne in Ireland, the cable-stayed footbridge at Laroin in France (using carbon-fibre composite cables), the repair of cement silos in Korea, the Putrajaya cable-stayed bridge in Malaysia, the renovation of the Agen footbridge in France, the soil consolidation project in the San Diego harbour and our contribution to the construction of retaining walls and abutments for the T-Rex freeway and railroad extension in Colorado, USA.

The Group’s recovery will be achieved through a policy designed to seize the best opportunities the market has to offer. The key to the continued success of our Group lies in the way our teams implement this policy by balancing technical and commercial cultures and tempering initiative and enthusiasm with firmness and realism. I continue to place my full trust in my current management team and in all the Group’s employees.
Wherever in the world they may be, I know that our teams are motivated, enthusiastic, passionate and profoundly committed to their companies. This daily ability to engage with the business and its objectives is fundamental to achieving our targets and it is in this way that we will work together for shared success.

In 2003, we will pursue our policy of consolidating our strengths and finalising the restructuring measures we began early in 2002. We will continue to apply our innovative approach to technology and will be working to transform that expertise into profitable long-term activities. We will maintain our commitment to improving our competitive position through product price reductions and increased productivity on all our sites, from the very smallest to the very largest. We will achieve this by paying special attention to risk prevention by implementing a new policy to promote awareness and fixed safety targets.

In 2003, we will also continue to make every effort to improve our cash position, especially in Freyssinet International et Cie Major Projets department, the Iberia-American Division and Reinforced Earth USA. We will be cooperating in the construction of a number of prestigious cable-stayed projects, including the Rion-Antirion bridge in Greece, the Millau Viaduct in France, the Cape Girardeau bridge in the USA and the second Panama Canal bridge. Development will continue at Ménard Soltraitement, because the growth potential in soil improvement technologies is huge. Lastly, we begin 2003 with a significantly larger order book for Reinforced Earth projects.

All of these strengths give us very good reason to view the future positively and to set ourselves an overall target that matches the achievements of Vinci Construction: a net operating profit level between 3 and 5%.

Chairman - CEO
Bruno Dupety

Deputy Managing Director
Joël Ponsoda

Financial Director
Michel Jarry

Administration and Human Resources Director
Claude Lascols

Operational Directors
Europe Division
Pierre Mellier

Iberia-American Division
Joël Ponsoda

Soils Division
Pierre Berger

Structures Division
Jérôme Stubler

Anglo-Saxon and Asia Pacific Divisions
Bruno Dupety
Innovation has always been central to the Freyssinet Group. As an integral part of the company’s culture, it has been at the heart of its activities for 60 years. The result of this commitment can be seen in the Group’s bulging portfolio of patents, which now contains no less than 140 inventions.

**Structures**

This year, the Group has done particularly well in structures, winning second prize in last June’s Siemens Innovation competition for its Régébéton process (see inset). The Group also leads the market in its original expertise of prestressing, with two important inventions in the areas of grouting (SmartGel) and couplers (Liaseal). SmartGel is a highly thixotropic grout that solves the problem of water filtration through the individual elements of strands and the ingress of water into the upper sections of cables. This product received CIP (French Interministerial Prestressing Commission) approval at the end of 2002. Liaseal provides a means of connecting prestressing ducts to the match-cast joints used in segmental precast concrete projects. Developed by Freyssinet’s Technical Department, this coupler was used for the first time in 2002 on the State Road 789 Ringling Causeway Bridge project in Florida.

Staying with prestressing, the CIP last year granted approval to our F prestressing system. This system offers a complete range of low power flat anchorages covering every requirement in the prestressing of buildings or thin elements such as slabs, floors and bridge deck sections. Other notable advances in 2002 include the use of carbon fibre composite cables to carry the deck of the Laroin footbridge near Pau in France... a world first! At 110 metres long and 2.5 metres wide, this footbridge crosses the Gave du Pau river in a single span and is an excellent example of 21st century engineering. The deck is carried by two sets of four high-performance carbon fibre cable stays. Each is made up of two or three bundles of seven composite rods, insulated from the external environment by a HDPE sheath. These bundles are connected to the pylon using rigid straps, and to the deck using adjustable straps. The anchorage zones are sealed using a patented Freyssinet stuffing box injected with petroleum wax. Composite rods deliver exceptional mechanical resistance and enable loadings of almost 7 tonnes. Their high levels of resistance to ageing and corrosion make carbon fibre cables the ideal solution for long-term structural durability. The Laroin footbridge is a full-size test bench that will enable the development of larger structures.

2002 also saw Freyssinet’s new stay cable anchors used on the Putrajaya Bridge in Malaysia.

In 2002, the Freyssinet Group devoted 1.3% of its turnover to research and development.
THE RÉGÉBÉTON PROCESS

On 19 June 2002, Freyssinet’s Régébétion process was awarded 2nd prize in the Building and Public Works sector of the second Siemens annual innovation competition organised by Siemens France. Patented by Freyssinet, this process enables the re-alkalization of carbonated concrete and the decontamination of chlorinated concrete. The technique involves applying an electrolytic paste to the concrete surface. A sacrificial anode is then set into the paste and connected to the concrete reinforcing bars, thus creating an electrical field that extracts the chlorine ions. This technique can be used to treat a structure without affecting its use or compromising its original concrete surfaces. The process was first applied to one of the structures operated by the Cofiroute motorway network to the south of Tours, and, in collaboration with Sogea Rhône-Alpes, on the A7 motorway south of Valence (France).

Lastly, Freyssinet has developed a new type of road surface expansion joint called WM, which has been designed to support heavy traffic loads. This new structural product is currently being tested by the Cofiroute network.

SOILS

In soil improvement, we have developed air-pressurised bottom-feed dynamic replacement column systems for onshore and offshore projects. More commonly referred to as SAS Bottom Feed systems, their first offshore application was in San Diego, USA, as part of the project to extend one of the National City Marine Terminal quays in the San Diego Embayment, a sedimentary basin delimited by a geological fault. From the telluric point of view, the site is located over the Rose Canyon fault on particularly unstable ground with high liquefaction potential at between 16 and 20 metres depth. To ensure the future of the new quay, which was constructed by sinking sheet piling to form caissons and backfilling with earth, it was felt necessary to improve the characteristics of the materials used to fill these caissons and create the slope below the quay by using the vibro-replacement method and the bottom-feed system (which introduces ballast through the end of the vibrating probe), designed to operate in offshore conditions (embankment densification). The Reinforced Earth Company is developing a new product called TerraNail. A prime application was on a project in South Africa where nails were used in combination with the TerraNail system to accommodate the traffic during construction, widen and improve a national road, and to improve the overall stability of the road embankment.

All these new products demonstrate the Group’s active sustainable development policy. This is a concept that the company sees as an ongoing commitment to ensure the long-term durability of structures in environmentally responsible ways.
€ 430.5 million
Consolidated turnover

€ 441 million
Managed turnover

3202
Managed workforce

2918
Consolidated workforce

Consolidated turnover

Managed turnover

Managed workforce

Consolidated workforce

Distribution by divisions

Soils
28.5% incl.
North America
16.4%
Structures
13.5%
Asia Pacific
21%

Distribution of T/O by activities

Soils
41% incl.
Reinforced Earth
30.5%
Ménard
Soltraitment
10.5%

Structures
59% incl.
new works
35%
repair/maintenance
24%

Workforce by job types

Engineers and senior managers
15%
Technicians
36%
Workers and employees
49%

Workforce by divisions

Europe
23%
Iberian-American*
9.5%
Anglo-Saxon
4.5%

*Based on 50%

North America
219

Soils
41% incl.
Reinforced Earth
30.5%
Ménard
Soltraitment
10.5%

Structures
59% incl.
new works
35%
repair/maintenance
24%

Workforce by job types

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Workforce by divisions

Europe
23%
Iberian-American*
9.5%
Anglo-Saxon
4.5%

*North America 219
The Freyssinet Group is involved in the construction, improvement and perpetuation of structures. In 2002, the repair activity fell back slightly in favour of construction works. The Group’s historic speciality of prestressing performed better than in the previous year, whilst its structural fittings activity almost doubled.

**Prestressing**

**Civil engineering works**

In 2002, Freyssinet saw sustained levels of activity in prestressing projects. In Thailand, we supplied and fitted 800 tonnes of prestressing cables, 1,836 15C15 anchors and 1,096 couplers for the construction of the Klong Phasicharoen elevated motorway. This immense viaduct is designed to relieve traffic congestion in the south-west of Bangkok, which is often paralysed by traffic jams.

Still in Asia, but this time in Taiwan, Freyssinet is carrying out the prestressing works on five viaducts that will carry the future high-speed rail link from Taipei to Kaohsiung.

In Australia, the Brisbane footbridge demanded a very special installation technique. Having been constructed on the river bank, it was floated by barge before being lifted into its final position. As part of the construction team, Group subsidiary Austress Freyssinet supplied and installed the prestressing for the bow-shaped central span. South African subsidiary Freyssinet Posten has supplied and installed the prestressing for the Maitengwe Bridge linking Botswana with Zimbabwe. The structure involves four concrete spans, each prestressed using cables of fifteen 15.7 mm diameter strands.

In Europe, the Group has been involved in the construction of the Infant D. Henrique Bridge near Porto in Portugal and the CTRL 310 Bridge in the UK, with the installation of 660 and 600 tonnes of prestressing cables respectively.

**Buildings**

In the Asia Pacific region, Freyssinet Thailand collaborated on the construction of the 22,700 m² Big C Super Centre in Bangkok. A total of 138 tonnes of prestressing cables were used in this project.

Further south, in Australia, construction work has begun on two enormous apartment blocks: the 300-metre high Eureka Tower in Sydney and...
the 260-metre high World Tower in Melbourne. Austress Freyssinet was invited to supply and install the prestressing required for the floors. In South Africa, Freyssinet Posten completed its part in the construction of DOMTEX, the new domestic flight terminal at Johannesburg Airport. Begun in 2001, the project involved the installation of 55,000m² of slab prestressing using the Freyssinet monostrand system. In France, the Group is helping to build the new 67,000m² Peugeot design centre at Vélizy, with the installation of 45 tonnes of prestressing for the slab beams. At Dubai in the UAE, we installed the prestressing required for the heavy load transfer beams used in the 200-metre high Shangri-La Tower and its car park. In the same city, Freyssinet is involved in the construction of eight 12,000m² residential blocks, supplying prestressing for 96,000m² of suspended floors.

Industries
An important industrial contract was also won during 2002: the prestressing works required for the Kudamkulam nuclear power plant in the southern Indian state of Tamil-Nadu. The project, which includes the construction of two nuclear reactors, is due for completion in 2004. Freyssinet will install 514 S5C15 anchors and 2,700 tonnes of greased sheathed strands.

Cabled structures
Stay cables
In July 2002, Freyssinet completed its contribution to the construction of the BR9 Bridge in Malaysia. This new structure crosses a 169 metre man-made lake with a principal span secured by two sets of 30 stay cables, counterbalanced by 21 pairs of retaining cables. The bridge provides access to the main boulevards of Putrajaya, the federal government’s new administrative centre. In the same country, the Group began work on installing the cable stays for the Sungai Muar bridge. It is a 632-metre long concrete structure linking Parit Bunga with Sabak. The main span of 132 metres uses 28 stay cables (94 tonnes of steel). In south-eastern Korea, we supplied and installed 353 tonnes of stay cables for the 230-metre long Samchonpo Bridge near the city of Sachon.

In Europe, 2002 was marked by two major projects. The first of these, the Laroin footbridge near Pau in southern France, involves a deck supported by two sets of four high-performance carbon fibre composite cable stays. The second was the Boyne Bridge in Ireland, where Freyssinet installed the 56 stay cables between September and December. This 245-metre long bridge uses a mixed cable-stayed span of 170 metres as part of a new road system to bypass the town of Drogheda on the M1.
As a partner in the consortium working to extend Hong Kong's East Rail network, Freyssinet is involved in the construction of its elevated viaducts. The Group is supplying and fitting the structural bearings, laying the precast span segments and carrying out prestressing works. 4,000 precast segments will be laid by mid-2003. The work is being done using a special overhead gantry modified and adapted by the Freyssinet technical department at Velizy (France).

The East Rail Viaducts (Hong Kong)

The Czerniakowski interchange viaducts (Poland).

During the year, the Group also signed a contract in France for the installation of stay cables on Millau Bridge 650 kilometres south of Paris. This cable-stayed viaduct will incorporate seven pylons. Freyssinet will install 154 cables weighing some 1,500 tonnes. In Greece, Freyssinet won the contract to install the cable stays required for the bridge linking the cities of Rion and Antirion on the Gulf of Corinth. The 2,250-metre long structure comprises three main spans of 560 metres each and access spans of 286 metres. The Freyssinet stay cable system to be installed on this structure uses the latest technological advances, including parascismic devices. Freyssinet will install nearly 3,500 tonnes of cable stays on this project.

In North America, Freyssinet began its involvement with the Bill Emerson Bridge. This 636-metre long structure will cross the Mississippi river near Cape Girardeau, linking Missouri to Illinois. The Group is supplying and installing the prestressing for both pylons and the bridge deck, as well as the 128 cable stays. 314 tonnes of steel will be used to create these two layers of stays. Freyssinet also won two other major cable-stay contracts during the year: the Cooper River Bridge in Missouri and the second Panama Canal Bridge. Both involve the use of 128 cable stays, the central spans being 471 metres for the former, and 420 metres for the latter.

Construction methods

In Asia, Freyssinet has provided the construction methods required for the Sungai Prai Bridge. The approach and access spans for this structure are being constructed span-by-span using precast segments positioned by an overhead launching gantry. The main span of the cable-stayed bridge is cantilevered out from each pylon using a gantry crane anchored to the deck. The precast access ramp segments are laid on temporary scaffolding. In Hong Kong, the Group is part of the consortium working to extend the East Rail network (see inset), under contracts TCC200 and TCC300. The viaducts now being constructed comprise two independent parallel decks. A total of 4,000 precast segments have been laid, some by overhead gantry. In Poland, Freyssinet Polska is involved in the incremental launching of the viaducts for Warsaw’s Czerniakowski interchange. The incrementally-launched 15-span section measures some
590 metres. At the same time, the Group was involved in launching the high-performance concrete Jonches Bridge near Auxerre in France. The incremental launching of this 135-metre long, 2,600-tonne double-girder structure is a first for France.

**Structural fittings**

Amongst the highpoints of 2002 was Freyssinet’s supply and installation of 3,500 structural pot bearings for the viaducts of the future high-speed rail link in Taiwan. In France, the Group laid 36 metres of roadway expansion joints and four WP500 and WP600 pavement expansion joints on the Tulle Viaduct in the Corrèze region. Eight Transpec 4 load transmitters were also installed. At the end of April 2002, Freyssinet completed work at Nice - Côte d’Azur Airport, having installed a total of 151 metres of JEP12 roadway expansion joints on the access viaducts, 24 metres of JEP3 joints on the footbridges and 1,100 metres of CIMAC joints in the main car park.

**Strengthening & Repair**

Freyssinet Korea completed the renovation of two Lafarge silos in Korea in just five months. The key part of solution adopted was the installation of a strengthening belt using 15 tonnes of extra prestressing cables and 256 X anchors.

In Europe, Freyssinet was invited to strengthen the 400-metre long Serpa Bridge. Freyssinet-Terra Armada Portugal strengthened the structure using removable external prestressing in the form of two 24T15 cables. Another notable project involved the bridge over the d’Abord River on the island of Réunion. The bridge was built in 1992, but two failed prestressing cables meant urgent repairs were needed; Freyssinet responded by fitting four of its 19T15 prestressing cables.

All the work was completed without closing the bridge to traffic.

In metropolitan France, Freyssinet France helped restore the Firminy apartment block built by Le Corbusier in 1960. This listed building’s 31,000 m² of external concrete was rejuvenated using a surface treatment involving sacrificial cathodic protection. We were also involved in the refurbishment of the water towers in the Saint-Louis district of Versailles, which date from 1900. Freyssinet reconstituted the concrete.
of these structures, as well as resealing them. Still in France, but this time in the Yonne region, the Group refurbished two structures built in the late 19th century to supply drinking water to Paris: the 355 metres of arches at Soucy and the 15 metres at Vautour. The work involved internal sealing works and masonry repointing.

In the UK, Freyssinet continued with the project begun in 1999 to modernise the Devonport Royal Dockyard in Plymouth, with the installation of prestressing bars and soil anchors for the moorings of the submarine dry-dock complex.

DEMOLITION/RECONSTRUCTION

As part of the complete renovation and extension of the Nedcor Foreshore Bank Building in Cape Town (South Africa), Group subsidiary Freyssinet Posten supplied and installed all the prestressing required for the 4-storey car park built on the site of the old building. The work involved 30 tonnes of compact strands and 3,120 anchors. In Europe, 2002 saw the complete renovation of the Dels Anglesos Bridge near Barcelona in Spain. Freyssinet partially demolished the structure of the 270-metre long bridge, rebuilding it using precast elements sections supplied by Tierra Armada. In France, Freyssinet spent seventeen months on the complete overhaul of the footbridge at Agen, a 263-metre long bridge built in 1839 across the River Garonne to link the district of Le Passage with the town of Agen. The works involved replacing the suspension and deck and installing new wooden planking.

Replacing the structural bearings of the Somain Bridge between Douai and Valenciennes in France. This 134-metre long structure was lifted using the LAO system (Computer Aided Lifting) to install eight structural pot bearings, whose capacity ranged from 450 tonnes for the abutments to 1,570 tonnes for some of the piers. In addition to the rebuilding works carried out on Mexico’s Pigua I Bridge, Freyssinet Mexico also supplied and installed Tetron CD structural bearings and CIPEC WP 400 roadway expansion joints.

REPLACEMENT OF STRUCTURAL FITTINGS

During the year, the company replaced the structural bearings of the Somain Bridge between Douai and Valenciennes in France. This 134-metre long structure was lifted using the LAO system (Computer Aided Lifting) to install eight structural pot bearings, whose capacity ranged from 450 tonnes for the abutments to 1,570 tonnes for some of the piers. In addition to the rebuilding works carried out on Mexico’s Pigua I Bridge, Freyssinet Mexico also supplied and installed Tetron CD structural bearings and CIPEC WP 400 roadway expansion joints.
In Pakistan, Freyssinet Middle-East LLC was involved in the construction of a 52.5 kilometre toll section of the M3 motorway linking the country’s textile capital of Faisalabad and its 4.5 million inhabitants with the city of Pindi Bhattian. The Group supplied Reinforced Earth walls for the construction of all the abutments carrying the 50-metre long upper box-girders and for a railway bridge. A prestressed concrete arched bridge built at the junction where the M3 meets the M2 also used Reinforced Earth abutments.

The surface area of the Reinforced Earth walls used in this project totalled 5,000 m², with some walls rising as high as 9 metres. In Malaysia, the Group played its part in improving traffic flow in Kuala Lumpur city centre when Reinforced Earth walls were chosen to create a flyover above the Besraya urban motorway. The construction process involved no disruption to traffic. The four 2,300 m² retaining walls, each 12.5 metres high, were completed in just ten weeks.

In France, as part of the works to the RD 910 between Pont-à-Mousson and Saint Avold, 2002 saw TerraTrel walls being used in eight separate civil engineering works designed by architect, François Doyelle. Terre Armée SNC provided design support for the retaining walls and technical assistance for their construction.

Another major project involved the construction of Reinforced Earth retaining walls for stage 6-5 of Korea’s high-speed rail link between Okcheon-Kun and ChungCheongBuk-Do. This is the first retaining walls project ever seen in the country and covers a total area of 5,600 m² with two 500-metre long walls, 10 metres high at their highest point. At the end of the year, Freyssinet Korea also signed a contract for the supply of over 13,600 m² of retaining walls with TerraClass cladding for the Mungok to Mureung road. In Brisbane, Reinforced Earth contributed to one of the largest urban road projects ever undertaken in Australia, constructing some 13,000 m² of Reinforced Earth retaining walls. The project was part of the Brisbane Expressway construction programme and incorporated the use of twenty-one structures of differing types, with colours and textures created using the new TerraPlus 2-metre square panels. In Europe, Reinforced Earth UK worked on the construction of the M6 Toll motorway north of Birmingham – the UK’s first toll-paying motorway. 45 kilometres of new roads and several civil engineering works are involved in the project,
of cladding will be used in the construction of T-Rex in the USA.

120,000 m²

with Reinforced Earth UK specifying and supplying 23,000 m² of TerraClass cladding elements and 500,000 metres of galvanised steel reinforcement. In the Netherlands, Terre Armée b.v. designed one-piece panels covered with TerraClass cladding for the abutments of two viaducts carrying the new A5 motorway near Schiphol Airport. A total of 870 m² of panels were applied to the abutments of the two structures. Terre Armée b.v. also supplied 4,063 m² of TerraClass retaining walls to the entire stretch. In Spain, Tierra Armada was involved in building the Las Palmas Bypass in the Canaries. The company designed and supplied all the materials used in constructing abutments with a surface area of 3,600 m². Measuring 24 metres high and 40 metres wide, these structures are amongst the highest of their type ever built. In the USA, Reinforced Earth began its collaboration in the T-Rex (Transportation Expansion) project to extend the freeway and rail networks around Denver in Colorado. The company will design 160 Reinforced Earth retaining structures using 1.5 by 3 metre concrete panels to clad a total area of 120,000 m². Some walls are particularly complex in order to meet specific architectural requirements. The new road network will open to users on 30 June 2008.

Tunnels and underpasses

In Spain, Tierra Armada was involved in the construction of an cut-and-cover tunnel near Villafranca Bierzon in the state of Léon. 170 metres in length, the 2-lane structure is 11 metres wide and 5.50 metres high, with raked openings. The central area of the right-hand carriageway was cast in-situ by mixer trucks, whilst the left-hand carriageway was cast in-situ using a 0.15 metre thick absorptive foam of identical geometry to that of the precast roof sections used at either end. The final 20 metres of each end of the tunnel and the raked openings are totally precast. Also in Spain, Tierra Armada has completed its involvement in the construction of the structure designed to cover metro line 9 at Rivas, near Madrid. This 220-metre long structure was built using precast sections throughout.

Foundations

In April 2002, Freyssinet renovated a shuttered wall to contain an embankment on the RD 58, road near Liévin in the Pas-de-Calais region on northern France, prior to its enlargement. 112 piles were sunk along the full length of the wall, with 220 ties to the main beam.

Soil improvement without additional materials

In Malaysia, Ménard Soltraitement was called in to consolidate the land to be used for the new rail link between Rawang and Ipoh. The methods used included dynamic compaction and vibro-compaction.
In Europe, 2002 was marked by two major projects, the first of which was the extension of the EADS plant in Hamburg (Germany), which was completed in November. Work on this site began in September 2001. Since then, Ménard Soltraitement has consolidated a total surface area of nearly 1,320,000 m², finishing off by using the patented Ménard Vacuum process. The pumping operation is scheduled to last ten months with daily monitoring of settlement.

By the time this project is completed, Ménard Soltraitement will have laid 2,150,000 drains at an average depth of 12.5 metres: a total of 26,850,000 linear metres of drains (excl. Vacuum). The second major project of last year was in France, where Ménard Soltraitement used dynamic compaction to prepare land for the construction of a storage warehouse at Gennevilliers near Paris. The project covered 25,500 m² of land to stabilise the mixture of fills found on the site. At 4 metres, the depth of soil to be treated required the use of a new compacting machine with a 25 metre jib lifting a weight of 20 tonnes. A second crane was then used to compact the remaining loose fill around these heavy impacts.

In North America, Ménard Soltraitement was engaged in a soil improvement project using dynamic compaction as part of the programme to build a public school at Thermal (Palm Springs) on a seismically active area. The aim of the project was to avoid any soil liquefaction in the event of earthquake. The area to be compacted was 40,000 m² (2,080 individual compactions), and the depth of compaction was 12 metres. To achieve this very significant depth, a crane with a 30-metre jib was used, lifting a weight of 25 tonnes.

A second, 15 tonne, crane was used to compact the remaining loose fill created by the initial impacts.

**Soil Improvement with Additional Materials**

In Malaysia, Ménard Soltraitement was involved in a soil improvement project at Putrajaya in preparation for the construction of an interchange. The work carried out involved the use of dynamic replacement and vertical drains.

In Australia, Ménard Soltraitement worked with Austress Freyssinet to improve the stability of a site to be used for the construction of a 32,000 m² supermarket at Bermuda. Dynamic replacement columns were installed to comply with the maximum settlement specification of 15/10,000 mm. The application of extremely accurate controls allowed the company to minimise vibration and noise below permitted levels. In Spain, Ménard Soltraitement consolidated a clay site beneath 17 metres of fill as part of the project to construct the high-speed rail link (AVE) between Cordoba and Malaga. To achieve this objective, 60,000 linear metres of dynamic replacement columns of between 7 and 8 metres in length and 70 cm in diameter were installed in a variable-depth grid pattern using two machines over an area of 20,000 m². One area of this clayey land required the installation of 30,000 metres of drains at a depth of 7 metres using the static method beneath a 7- to 8-metre fill. Ménard Soltraitement also used dynamic replacement columns to improve...
The patented Ménard Vacuum process in use at Hamburg (Germany).

The soil prior to construction of the future Castorama store at Gdańsk in Poland. The 15,000 m² building is being built on fills that exceed 15 metres in places. An additional geotechnical survey conducted using the Ménard pressure meter revealed very poor ground consistency down to 7 metres, improving to average/good at lower depths. It was to cope with this situation that the solution of building on dynamic replacement pillars was adopted.

In June 2002, as part of the project to build a waste processing centre at Villers-Saint-Paul in France, Ménard Soltraitement used Controlled Modulus Columns to stabilise the soil. The columns were drilled to a depth of 7.5 metres in 3-metre square grids. The work was completed in just four months using 2 machines to install the total number of 1,800 columns used in the project.

In San Diego (California, USA), Ménard Soltraitement was involved in the southern extension of quay 24-4 at the National City Marine Terminal. The extension project involves enlarging the shoreline by sinking sheet piling to form caissons and backfilling with earth. A 340-metre long, 25-metre wide pontoon will be constructed above and outside the site and will be used for unloading containers from ships alongside. To ensure the stability of the system and the effective retention of the new pontoon, the specification of the material used to fill the caissons and embankments beneath the pontoon was optimised using the vibro-replacement method and the bottom feed system (which introduces ballast through the end of the vibrating probe), designed to operate in offshore conditions.

**Decontamination**

In August 2002, Ménard Soltraitement was engaged to carry out soil improvement and decontamination works on the site of the future CORA hypermarket to the east of Bucharest in Romania. The soil treatment work was complete in four months using two ballasted column rigs fitted with 12-metre and 18-metre vibrating probes and a compacting crane. By the end of the project, over 5,220 dynamic replacement columns had been sunk to a depth of 15 metres, 750 dynamic replacement pillars had been installed and 800 compacting impacts had been made. Having solved the foundation problems, Ménard Soltraitement began at the end of last year to apply the same venting technique that proved so successful on the Stade de France project. This technique consists of using a network of drains to circulate fresh air through the contaminated soil. This dilutes the decomposition gases to the point where they cease to be noxious. The networks, which are installed beneath the future building (40,000 m²), involve approximately 14,000 metres of drains and 5,600 metres of manifolds.

AUSTRALIA

Austress Freyssinet Pty Ltd
Seven Hills
Reinforced Earth Pty Ltd
Hornsby

NEW ZEALAND

Freyssinet New Zealand Ltd
Reinforced Earth Ltd
Auckland

OCEANIA

THE FREYSSINET GROUP AROUND THE WORLD
## Consolidated Balance Sheet

### Assets

<table>
<thead>
<tr>
<th>Item</th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intangible assets other than goodwill</td>
<td>4,497</td>
<td>7,482</td>
</tr>
<tr>
<td>Goodwill</td>
<td>19,999</td>
<td>23,937</td>
</tr>
<tr>
<td>Tangible assets</td>
<td>26,113</td>
<td>25,780</td>
</tr>
<tr>
<td>Financial assets</td>
<td>5,157</td>
<td>7,154</td>
</tr>
<tr>
<td><strong>Subsidiaries and affiliates</strong></td>
<td>1,910</td>
<td>2,444</td>
</tr>
<tr>
<td><strong>Other financial assets</strong></td>
<td>3,247</td>
<td>4,710</td>
</tr>
<tr>
<td><strong>Total fixed assets</strong></td>
<td><strong>55,766</strong></td>
<td><strong>64,353</strong></td>
</tr>
<tr>
<td>Inventories and work in progress</td>
<td>25,728</td>
<td>37,916</td>
</tr>
<tr>
<td>Trade notes and accounts receivables</td>
<td>147,668</td>
<td>144,274</td>
</tr>
<tr>
<td>Others receivables</td>
<td>27,746</td>
<td>22,757</td>
</tr>
<tr>
<td>Deferred tax asset</td>
<td>3,017</td>
<td>126</td>
</tr>
<tr>
<td>Short-term financial receivables and other investments securities</td>
<td>7,021</td>
<td>10,792</td>
</tr>
<tr>
<td>Cash</td>
<td>15,919</td>
<td>17,430</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>227,099</strong></td>
<td><strong>233,295</strong></td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>282,865</strong></td>
<td><strong>297,648</strong></td>
</tr>
</tbody>
</table>

### Equity and Liabilities

<table>
<thead>
<tr>
<th>Item</th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital stock</td>
<td>15,625</td>
<td>15,625</td>
</tr>
<tr>
<td>Consolidated reserves - group share</td>
<td>37,468</td>
<td>24,429</td>
</tr>
<tr>
<td>Net income of the period - group share</td>
<td>-11,951</td>
<td>-559</td>
</tr>
<tr>
<td><strong>Shareholder’s equity</strong></td>
<td><strong>41,142</strong></td>
<td><strong>39,495</strong></td>
</tr>
<tr>
<td>Minority interests</td>
<td>5,237</td>
<td>6,056</td>
</tr>
<tr>
<td>Provision for liability</td>
<td>30,574</td>
<td>23,264</td>
</tr>
<tr>
<td>Long-term financial debt</td>
<td>30,310</td>
<td>27,059</td>
</tr>
<tr>
<td><strong>Total long-term capital</strong></td>
<td><strong>107,263</strong></td>
<td><strong>95,874</strong></td>
</tr>
<tr>
<td>Down-payments from clients</td>
<td>9,779</td>
<td>5,898</td>
</tr>
<tr>
<td>Trade notes and accounts payable</td>
<td>92,633</td>
<td>92,259</td>
</tr>
<tr>
<td>Others payables</td>
<td>42,754</td>
<td>47,699</td>
</tr>
<tr>
<td>Deferred tax liabilities</td>
<td>841</td>
<td>595</td>
</tr>
<tr>
<td>Short-term financial debt</td>
<td>29,595</td>
<td>55,323</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>175,602</strong></td>
<td><strong>201,774</strong></td>
</tr>
<tr>
<td><strong>Total equity and liabilities</strong></td>
<td><strong>282,865</strong></td>
<td><strong>297,648</strong></td>
</tr>
</tbody>
</table>
## Consolidated Income Statement

**(In thousand of euro)**

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>430 488</td>
<td>388 649</td>
</tr>
<tr>
<td>Other income</td>
<td>8 910</td>
<td>9 064</td>
</tr>
<tr>
<td>Total income</td>
<td>439 398</td>
<td>397 713</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>-436 163</td>
<td>-380 466</td>
</tr>
<tr>
<td><strong>Operating income</strong></td>
<td><strong>3 235</strong></td>
<td><strong>17 247</strong></td>
</tr>
<tr>
<td>Financial expenses</td>
<td>-4 198</td>
<td>-5 336</td>
</tr>
<tr>
<td>Depreciation and provisions, financial items</td>
<td>-270</td>
<td>1 286</td>
</tr>
<tr>
<td><strong>Net financial income/(loss)</strong></td>
<td><strong>-4 468</strong></td>
<td><strong>-4 050</strong></td>
</tr>
<tr>
<td>Pre-tax income before extraordinary items</td>
<td>-1 233</td>
<td>13 197</td>
</tr>
<tr>
<td>Exceptional items</td>
<td>-925</td>
<td>-4 702</td>
</tr>
<tr>
<td>Depreciation and provisions</td>
<td>-5 433</td>
<td>-5 488</td>
</tr>
<tr>
<td><strong>Net exceptional income/(loss)</strong></td>
<td><strong>-6 368</strong></td>
<td><strong>-10 190</strong></td>
</tr>
<tr>
<td>Amortisation of goodwill</td>
<td>-3 714</td>
<td>-1 522</td>
</tr>
<tr>
<td>Current taxes</td>
<td>-3 026</td>
<td>-1 875</td>
</tr>
<tr>
<td>Deferred taxes</td>
<td>2 616</td>
<td>0</td>
</tr>
<tr>
<td><strong>Net income from consolidated companies</strong></td>
<td><strong>-11 725</strong></td>
<td><strong>-390</strong></td>
</tr>
<tr>
<td>Group share in equity interest</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Minority interests</td>
<td>-226</td>
<td>-169</td>
</tr>
<tr>
<td><strong>Net income (group share)</strong></td>
<td><strong>-11 951</strong></td>
<td><strong>-559</strong></td>
</tr>
</tbody>
</table>

## Past three years

**(In thousand of euro)**

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2001</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>430 488</td>
<td>388 649</td>
<td>377 480</td>
</tr>
<tr>
<td>Foreign sales</td>
<td>330 483</td>
<td>289 672</td>
<td>279 176</td>
</tr>
<tr>
<td>Net income - group share</td>
<td>-11 951</td>
<td>-559</td>
<td>7 121</td>
</tr>
<tr>
<td>Shareholders’ equity including income of the period</td>
<td>41 142</td>
<td>39 495</td>
<td>43 101</td>
</tr>
<tr>
<td>Provisions for liabilities</td>
<td>30 574</td>
<td>23 264</td>
<td>33 291</td>
</tr>
<tr>
<td><strong>Cash flow generated from operations</strong></td>
<td><strong>8 678</strong></td>
<td><strong>398</strong></td>
<td><strong>15 567</strong></td>
</tr>
<tr>
<td>Capital expenditure and financial investments of the period:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>15 280</td>
<td>18 540</td>
<td>19 442</td>
</tr>
<tr>
<td>Acquisition of financial investments</td>
<td>11 863</td>
<td>13 825</td>
<td>12 340</td>
</tr>
<tr>
<td>3 417</td>
<td>4 715</td>
<td>7 102</td>
<td></td>
</tr>
<tr>
<td>Average number of employees</td>
<td>2 918</td>
<td>2 788</td>
<td>2 552</td>
</tr>
</tbody>
</table>