CONSERVE METALS IN CONSTRUCTION!

B. S. Fedorov

In Moscow from June 6 to 9, an All-Union conference/seminar was held on questions of conserving ferrous metals, in the light of resolutions of the Twenty-Fifth Congress of the Communist Party of the Soviet Union (CPSU) and the December 1977 Plenary Session of the Central Committee (CC) of the CPSU convened by the State Construction Committee (Gosstroi) of the USSR, by the CC of the Trade Union of Construction Workers, and the Central Directorate of the Scientific-Engineering Branch (SEB) of the Construction Industry, aimed at exchanging up-to-date experience and exploring possibilities of reducing the consumption of metalwork on projects, and a rational utilization of rolled steel sections and steel pipes in construction.

Participating in the conference were I. N. Dmitriev, Chief of Construction of the CC of CPSU; G. A. Karavaev, Minister of Construction of the USSR; A. M. Tokarev, Minister of Industrial Construction of the USSR; B. V. Bakin, Minister of Installation and Special Works of the USSR; B. E. Shcherbina, Minister for Construction of Undertakings of Petroleum and Gas Industries; M. S. Zotov, Chairman of the Directorate of the State Bank for Financing Construction (Stroibank); I. I. Ishchenko, Chairman of the Central Directorate of the SEB of the Construction Industry and Deputy Chairman of Gosstroi of the USSR; O. D. Opekunov, Secretary of the CC of the Trade Union of Construction Workers and Construction-Materials Industry; managers and leading specialists of Ministries and Departments of the USSR, State Civil Construction Committee (Gosgrazhdanstroi), State Construction Committees of Soviet Republics, scientific-research, design, construction-installation organizations; undertakings of the construction industry, construction materials and ferrous metallurgy.

The opening address was given by I. T. Novikov, Deputy Chairman of the Council of Ministries of the USSR and Chairman of Gosstroi of the USSR.

Managers of several scientific-research and design institutes who spoke at the conference, also the Deputy Minister of Ferrous Metallurgy of the USSR, indicated measures for reducing consumption of ferrous metals in construction and for minimizing losses due to corrosion.

V. E. Dymshits, Deputy Chairman of the Council of Ministers of the USSR, also spoke at the conference.

There are still great possibilities for effecting economy in metals used in foundation engineering, and this must be placed at the disposal of industry.

Guided by the resolution of the CC of CPSU, "On the organizational and political work of the Chelyabinsk Provincial Committee of the Party on the conservation of ferrous metals in undertakings and on construction in the province in the light of the requirements of the Twentieth-Fifth Congress of the CPSU," Party and trade-union organizations of scientific and design agencies working in the field of foundation engineering are taking all possible measures for the further expansion of investigations in this direction and the most rapid introduction of scientific achievements into construction practice.

As the leading institute on bases, foundations, and underground structures, the Scientific-Research Institute of Bases and Underground Structures (NII Osnovanii) fully recognizes the whole measure of the responsibility it bears in ensuring a high standard and reliability of buildings and structures, with regard to the wide variety of natural-climatological and engineering-geological construction conditions in the expanses of our great Motherland.

Expenditure on construction of the underground parts of buildings and structures amounts to up to 10% of the total construction cost and, with regard to materials and labor input, they range not infrequently up to 20%. With a capital expenditure in 1978 amounting to 125,500 million rubles, they represent a very large outlay; therefore, technical progress in foundation engineering is of great importance in construction as a whole.

In recent years considerable success has been achieved in the field of foundation engineering by scientific-research, design, and industrial organizations. The main results of this work were reflected in the Construc-

Introduction of only the first two to replace the outdated chapters secures an annual saving of over 100 million rubles. The most important problem for design and construction organizations is the obligatory observance of the requirements of SNIP, which ensures considerable economy in cement, concrete, and, primarily, metals.

The total volume of piled foundations used in construction in the country amounts to 6 million m³ at the present time. Concealed here is a great possibility of conserving steel, which can be effected by adopting progressive pile designs (piles without transverse reinforcement, pyramidal and rhombic types, post piles, cast-in-place, et al.).

In 1977, 839,000 m³ of piles with reduced usage of steel were utilized, which enabled 15,800 tons of reinforcement to be saved.

Unfortunately, progressive designs of piles amount to only 25% of the total volume of piled works in the USSR. Although several agencies, particularly the Ministry of the Construction Industry (Minpromstroi) and Ministry of Construction (Minstroi) of the USSR, realized the significance of progressive pile designs and are increasing their usage volume annually, nevertheless, such piles are being introduced only gradually. The wastefulness of steel should be suppressed, and the proportion of piles with a reduced steel consumption used in construction should be raised to 80%. It is essential that all construction Ministries and agencies establish firm targets for the introduction of such piles, which should amount to 1.2 million m³ in 1978 and 1.5 million m³ in 1980, with the object of raising their volume in future to 4 million m³.

The position with regard to the adoption of progressive pile designs is particularly poor in the construction organizations of the Moscow City Executive Committee (Mosgorispolkom). The Moscow City Main Directorate of Industrial Construction Materials (Glavmospromstroimaterialy) produces 200,000 m³ of piles annually, but only 5000 m³ without transverse reinforcement, of which the construction organizations of the Moscow City Soviet (Mossovet) use only 2000 m³. Meanwhile the Reinforced-Concrete Products factory No. 13 has mastered the technology well, produces piles of a high standard, and could supply this output to construction works in Moscow in the required quantities.

Construction organizations in Moscow should give serious consideration to the technology of driving piles, their transport, and storage. In many cases the technical conditions are not observed, and this leads to big losses.

A very promising method of constructing underground structures, which, in particular, enables large savings of steel to be made (up to 20 kg/m³), is the "wall-in-ground" method which, in recent years, has been developed very well, is widely publicized in the press, and has become well known to all construction men. This method can be used to construct the most important underground structures, which have a supporting, protective, or antiseepage function, and for protecting the environment.

In recent times Gosstroi of the USSR has approved the necessary standards, documents, handbooks on the design and execution of works by this method. Nevertheless, this method is being introduced very slowly.

In 1978 it is planned to build only 160,000 m² of structures by the "wall-in-ground" method. This is quite insufficient. The Ministry of Construction and Road Machine Building (Minstroizdormash) did not, during the Ninth Five-Year Plan, fulfill the plan for the manufacture and issue of equipment for digging trenches in using the "wall-in-ground" method, although the engineering requirements based on tests of experimental specimens were supplied in time. And the position in the Tenth Five-Year Plan is no better. In 1978 it is planned to deliver only two such machines, but life today demands a wide application of this equipment. One must render their dues to the Ministry of Special Installation Construction (Minmontazhspetsstroi) of the USSR, the Ministry of Power and Electrification of the USSR, and to Ukrainian construction engineers who, without waiting for Minstroizdormash to fulfill its obligations, are manufacturing the equipment themselves as required, and constructing bearing and antiseepage "walls-in-the-ground." The Moscow Main Directorate of Engineering Construction (Glavmosinzhstroi), on the other hand, has to buy this basically simple tractor-mounted equipment in France and Japan, expending a large amount of currency.

Exploitation of the underground space of large cities and protection of the environment in the vicinity of industrial undertakings requires application of the "wall-in-ground" method on a large scale. In the construction of cleaning buildings of the Ostashkovsk leather factory alone, application of this method enabled the driving of