

~~SECRET~~

Nº

62

ECONOMIC INTELLIGENCE REPORT

THE CONSTRUCTION INDUSTRY
OF CZECHOSLOVAKIA
1947-60



CIA/RR 104

16 September 1957

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

~~SECRET~~

W A R N I N G

This material contains information affecting the National Defense of the United States within the meaning of the espionage laws, Title 18, USC, Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

S-E-C-R-E-T

ECONOMIC INTELLIGENCE REPORT

THE CONSTRUCTION INDUSTRY OF CZECHOSLOVAKIA
1947-60

CIA/RR 104
(ORR Project 47.1774)

CENTRAL INTELLIGENCE AGENCY
Office of Research and Reports

S-E-C-R-E-T

S-E-C-R-E-T

CONTENTS

	<u>Page</u>
Summary	1
I. Position in the Economy	3
II. Organization	5
A. Government Control	6
B. Division of Responsibility	7
III. Postwar Construction	9
IV. Construction in Major Economic Sectors	15
A. Industry	15
B. Electric Power	19
C. Transportation	22
D. Housing	23
V. Major Inputs	28
A. Manpower	28
B. Materials	31
VI. Equipment and Technology	33
VII. Conclusions	36

Appendixes

Appendix A. Construction Enterprises Subordinate to the Czechoslovak Ministry of Construction and to the Slovak Commissariat of Construction	39
Appendix B. Methodology	43



50X1

S-E-C-R-E-T

Tables

	<u>Page</u>
1. Socialized and Private Enterprises and Employees in Construction in Czechoslovakia, 1949	5
2. Distribution of Construction Output in Czechoslovakia During the Two Year Plan, 1947-48	11
3. Distribution of Construction Output in Czechoslovakia During the First Five Year Plan, 1949-53	12
4. Volume and Growth of Construction in Czechoslovakia, 1938 and 1947-56	13
5. Average Utilization Time of Machinery and Equipment in Construction Work in Czechoslovakia, 1953-55	15
6. Volume of Housing Construction in Czechoslovakia, 1948-56	24
7. Number and Average Size of Dwelling Units and Total Area of Housing Constructed by the State in Czechoslovakia, 1948-55	26
8. Manpower in the Construction Industry of Czechoslovakia, 1947-56	29
9. Production of Cement and Bricks in Czechoslovakia, 1937 and 1948-56	32
10. Consumption of Materials and Period of Construction in Standard and Prefabricated Construction in Czechoslovakia	36

CIA/RR 104
(ORR Project 47.1774)

S-E-C-R-E-T

THE CONSTRUCTION INDUSTRY OF CZECHOSLOVAKIA*
1947-60

Summary

Construction in Czechoslovakia was sharply curtailed during the German occupation in World War II. The Germans concentrated on the repair of war damage, the conversion of plants to war production, the shifting of plants to reduce their vulnerability to air attack, and a limited amount of industrial construction. Construction of housing virtually ceased. As a result of the reduced volume of construction, large numbers of construction workers left the construction industry for other employment, leaving the industry in the early postwar years with a labor force less than half as large as that in prewar years. With the beginning of economic planning in 1947, the industry was nationalized and rapidly expanded, and employment in construction rose from 161,000 in 1947 to 364,000 in 1953, where it has since been stabilized.

The construction industry has played a significant role in the economic development of Czechoslovakia since 1947. During 1947-53, construction accounted for more than 60 percent of total fixed capital investment, and its relative share of the national income rose from 4.7 percent in 1948 to 8.1 percent in 1953. During the Two Year Plan (1947-48), housing and public works received the largest share of construction resources. Industrial construction was limited largely to the rehabilitation of basic industries which suffered war damage or capital depletion during the occupation and did not significantly alter the existing balance between light and heavy industry. Industrial expansion proceeded rapidly with the beginning of the First Five Year Plan (1949-53), with the major emphasis on development of heavy industry as opposed to light and consumer goods industry. Expansion and new construction of facilities for heavy industry since 1948 have fundamentally altered the structure of industry in Czechoslovakia. Within heavy industry, however, serious disproportions had developed by the end of 1953. The machine building industry was expanded disproportionately faster than the fuels, power, and raw materials bases,

* The estimates and conclusions contained in this report represent the best judgment of ORR as of 1 July 1957.

S-E-C-R-E-T

S-E-C-R-E-T

and production bottlenecks resulted. In 1954 and 1955 the rate of expansion of the machine building industry was slowed as greater attention was given to expanding the production base in the basic industries, and this policy is continued in the Second Five Year Plan (1956-60). The most glaring failure in construction since 1948 has been in the field of housing construction, which has suffered from the higher priority accorded to industry in the allocation of construction resources. The backlog of demand resulting from the curtailment of construction of housing during the war and the growing urbanization accompanying industrial expansion combined to create a serious housing shortage in urban areas, and this shortage has prevailed throughout the postwar period. Because of adverse effects on labor efficiency and stability, the shortage of housing continues to be one of the most serious economic problems facing the regime.

In response to the demands of reconstruction and development, the volume of construction increased significantly after 1947. Output in 1948 was 60 percent above the level of 1947, output in 1953 was 130 percent above the level of 1948, and output in 1956 was 18 percent above the level of 1953. Despite this significant growth, however, the volume of construction has consistently failed to meet the goals outlined in the economic plans. The major limitation to further expansion of construction output has been a continuing shortage of construction labor, particularly skilled labor. This shortage has been particularly evident since 1953, when a peak was reached in the size of the labor force. As a consequence, greater efficiency and increased labor productivity have been the keys to continued expansion of construction output since 1953. The construction industry, however, has failed to take full advantage of improved technology as a means of increasing its output. Primarily because of poor organization and management of construction work, machinery and equipment (which has been added in significant amounts) is inefficiently utilized, poorly maintained, and in repair for excessive lengths of time. As a result, the expected increases in labor productivity from increased mechanization of construction work have not materialized.

The development of industrialized methods of construction (that is, the use of prefabricated elements) has been a goal of the construction industry since 1951. By 1955, however, only minor progress had been made in applying the use of prefabricated elements in construction, chiefly because of bureaucratic mismanagement. The experience gained since 1951 in the production and assembly of prefabricated elements nevertheless affords the basis for a rapid expansion in

- 2 -

S-E-C-R-E-T

S-E-C-R-E-T

the use of industrialized methods during the Second Five Year Plan. Experiments have demonstrated that significant increases in labor productivity as well as savings in materials and a reduction in construction time can be achieved through the use of prefabricated elements. The Second Five Year Plan envisages a rapid increase in the application of prefabricated elements in construction. The goal of a 60-percent increase in construction output by 1960 compared with 1955 will depend to a large extent on the success of the construction industry in adapting its operations to industrialized methods of construction.

I. Position in the Economy.

During World War II, construction in Czechoslovakia, except for military purposes, was sharply curtailed. Building activity during the war consisted mainly of conversion of plants to war production, some industrial construction, repair of war damage, and shifting of plants to reduce their vulnerability to air attack. As a result of this reduced volume of construction, large numbers of construction workers were shifted to other types of employment. In 1947 the number of construction workers totaled only about 161,000 compared with 318,000 in 1930.

The demands of reconstruction and industrial development required a rapid expansion of the construction industry, which assumed a vital role in the postwar economic development of Czechoslovakia. After 1947 the Communist regime rapidly proceeded to nationalize the construction industry, and by the middle of 1949 about 93 percent of all construction workers had been organized into large, integrated construction enterprises. Construction manpower rose to 228,000 in 1948 and reached a postwar peak of 365,000 in 1956.

The 228,000 workers employed in construction in 1948 represented about 5.8 percent of the nonagricultural labor force. 1/* Because of the demands placed on the construction industry by the First Five Year Plan (1949-53), the number of workers in construction was increased faster than in nonagricultural employment as a whole, until in 1953

50X1

S-E-C-R-E-T

construction workers accounted for about 7.7 percent of the nonagricultural labor force. Employment in construction has remained relatively stable since 1953, however, and in 1955 the construction sector employed about 7 percent of all nonagricultural labor. 2/

The requirements of postwar reconstruction, the program of industrialization, and the pressing need for housing combined to give the construction industry an important investment role in postwar economic development. Of total planned investment in the Two Year Plan (1947-48), about 55 percent was to be allocated for construction-assembly work. Construction-assembly* work, however, actually accounted for about 64 percent of investment over this 2-year period. 3/ During the period of the First Five Year Plan the share of construction in total investment declined to about 60 percent, 4/ a figure still considered excessive by the regime and high in relation to comparable figures in Western European countries. The principal causes of this high ratio of construction to investment were (1) the tendency to concentrate on large industrial projects which matured slowly; (2) the tendency to have too many projects under way simultaneously, with consequent delays at construction sites and failures to commission projects when planned; and (3) higher actual costs of construction than were envisaged in the economic plans. The share of investment devoted to construction probably declined in 1954 and 1955 as more emphasis was placed on completion of projects under way and less emphasis on starting new projects. According to the Second Five Year Plan, investment is to increase faster than construction. Thus a further drop in the share of construction in investment is to be expected, provided the deficiencies noted above are corrected.

The relative contribution of the construction industry to national income increased steadily from the end of World War II through 1953. In 1953 the proportion of total national income contributed by the construction industry was 72 percent greater than in 1948 and nearly three times as great as in 1937. Net output of the construction industry as a percent of national income is as follows 5/:

<u>1937</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>
3.0	4.7	5.5	6.4	6.9	6.9	8.1

* In the USSR and the European Satellites the cost of construction-assembly includes the cost of installing production equipment (but not the cost of the equipment) in construction costs.

S-E-C-R-E-T

II. Organization.

The prewar construction industry in Czechoslovakia was composed of a large number of small- and medium-sized private enterprises and relatively few large private concerns. Of about 25,861 private enterprises in the construction industry in 1933, 520 were large corporations, 10,191 were partnerships, and the remainder were small personal types of organizations. 6/

Nationalization of the industry proceeded rapidly after the Communists came to power in 1948, with the emphasis on formation of large, centrally directed enterprises. The number of socialized and private enterprises and employees in construction in Czechoslovakia in 1949 is shown in Table 1. By the middle of 1949, about 93 percent of total construction manpower in Czechoslovakia had been organized into 269 socialist enterprises. 7/

Table 1

Socialized and Private Enterprises and Employees in Construction
in Czechoslovakia
1949

<u>Sector</u>	<u>Number of Enterprises</u>	<u>Number of Employees</u>	<u>Employment (Percent of Total)</u>
Socialized			
National	193	214,171	79.2
Communal	55	6,042	2.2
Cooperative	21	2,653	1.0
State and public administration		27,993	10.3
Subtotal	<u>269</u>	<u>250,859</u>	<u>92.7</u>
Private	2,859	19,792	7.3
Total	<u>3,128</u>	<u>270,651</u>	<u>100.0</u>

- 5 -

S-E-C-R-E-T

S-E-C-R-E-T

Of the 2,859 private firms still in existence on 30 June 1949, about three-fourths employed fewer than 11 persons, and about one-third had only 1 or 2 employees. 8/ In 1953 the socialized sector of the industry accounted for 99.7 percent of total construction output in Czechoslovakia. 9/

By the end of 1955 there were 210 large, national construction enterprises and 350 local enterprises. In 1955, national enterprises accounted for 81.2 percent of all construction by the socialized sector, local enterprises for 16.6 percent, and cooperatives for 2.2 percent. In addition to these enterprises, there were about 3,500 private builders operative during 1955. 10/

A. Government Control.

Under the Communist regime, control over all phases of the planning and execution of construction in Czechoslovakia was centered at the ministerial level, a condition which resulted in serious errors in planning and in reduced operational efficiency. Responsibility for the planning and execution of investment construction was widely dispersed among the various economic and defense ministries and the kraj* national committees. Before October 1955, proposals for investment projects in the various economic sectors apparently were prepared in the responsible ministries and submitted to the State Planning Commission for approval. Control of actual construction is similarly divided -- each ministry having responsibility for investment projects maintains construction enterprises under its direct control.

In an apparent move to insure better coordination of investment plans, a State Committee for Construction, with ministry rank, was formed in October 1955. This committee was given authority to coordinate investment plans and to exercise control over all major aspects of construction for the national economy. 11/ In its work of coordinating investment plans the State Committee for Construction is to cooperate closely with the State Planning Commission. As in the USSR the creation of a supraministerial agency with centralized authority to coordinate and control all major construction activity was apparently considered essential to the success of plans for the development of heavy industry in the Second Five Year Plan. 12/ In addition to a chief and three deputy chiefs, the State Committee

* An administrative subdivision.

S-E-C-R-E-T

for Construction has the following five departments, or administrations: (1) mines, foundries, and power station construction; (2) industrial construction; (3) road construction; (4) residential and city construction; and (5) legislative and organizational divisions. 13/ Simultaneously with the creation of the State Committee for Construction, control of construction activity was further centralized with the formation of a Central Administration for Apartment and Public Building to supervise the work of the building departments of the National Committees and the local building enterprises. 14/

Centralization of control over the planning and execution of construction in Czechoslovakia, as well as in other European Satellites, has generally resulted in the formulation of unrealistic plans for investment in construction and has contributed to delays and rising costs of construction. Planners in the economic ministries have tended to be overly optimistic in formulating plans. The plans have consistently underestimated the amount of resources required for construction of investment projects, with the result that actual costs exceeded planned costs. Thus building plans tended to be extravagant, and more projects were started simultaneously than could be adequately supplied with labor and materials. The resulting delays pushed construction costs even further above Plan figures, so that the planned physical volume of construction was often not achieved with allocated investment funds.

Beginning in 1956, considerable attention was given to measures to decentralize control over economic activity in order to give enterprise managers a greater voice in planning and management. Utilization of enterprise managers' technical ability and knowledge of local conditions should result in the more realistic formulation of construction plans. There is not yet, however, any concrete information on the nature, extent, or effects of decentralization measures on the construction industry in Czechoslovakia.

B. Division of Responsibility.

There is little definitive information on the division of responsibility in construction among economic ministries in Czechoslovakia having jurisdiction over construction enterprises. In 1955, enterprises subordinate to the Czechoslovak Ministry of Construction and to the semiautonomous Slovak Commissariat of Construction accounted for about 50 percent of total construction output in Czechoslovakia. 15/

S-E-C-R-E-T

The Czechoslovak Ministry of Construction is organized into eight Main Administrations of National Enterprises with responsibilities in the following fields: (1) construction of large industrial combines, (2) other industrial constructions, (3) special constructions (not identified), (4) residential and other public construction, (5) engineering and hydraulic construction, (6) production and distribution of construction materials, (7) terrain research, and (8) commercial matters. 16/ The Slovak Commissariat of Construction is composed of the following four Main Administrations of National Enterprises: (1) industrial construction, (2) engineering construction, (3) residential and other construction, and (4) the manufacture of construction materials. 17/

Each of these 12 main administrations has under its jurisdiction a number of enterprises which perform construction work in the administration's sphere of responsibility. Of the 210 national enterprises in Czechoslovakia in 1955, 51 were under the jurisdiction of the Ministry of Construction and the Slovak Commissariat of Construction.* 18/ Four special enterprises at Ostrava, Trinec, Kosice, and Svaty Kriz engage in construction of large industrial combines. In addition, 10 other enterprises -- 6 in the Czech Lands (Bohemia and Moravia) and 4 in Slovakia -- engage in other industrial construction. A special enterprise with headquarters at Usti nad Labem engages in construction of chemical plants. Two enterprises in the Czech Lands and one in Slovakia operate in the mining, foundry, and electric power fields. Other enterprises subordinate to the Ministry and the Commissariat engage in construction of apartment houses and workers' settlements, transportation facilities, and engineering and hydraulic installations. 19/

There are numerous scattered references to operations of national construction enterprises subordinate to other economic ministries. Available data do not permit, however, any tabulation of the number of enterprises subordinate to each ministry or their specific functions. The 350 local construction enterprises probably engage for the most part in construction of housing and of communal and municipal facilities for their particular districts. It is also likely that, as in certain other Satellite countries, the local enterprises are available to the Czechoslovak Ministry of Construction and Ministry of Defense for work on projects of national significance within their districts.

* For a detailed list of national construction enterprises subordinate to the Czechoslovak Ministry of Construction and the Slovak Commissariat of Construction, with their functions and locations, see Appendix A.

S-E-C-R-E-T

The Ministry of Defense controls the planning and execution of military construction and the construction of civil defense installations for the military. Construction plans for military installations are prepared by the Institute for Military Projects of the Ministry of Defense. 20/ Actual construction is directed by the Directorate General of Military Construction, which collaborates closely with headquarters of the technical battalions supplying manpower for military projects. The Ministry of Defense also has the following national construction enterprises at its disposal 21/:

1. Konstruktiva, a combined military-civilian enterprise with headquarters at Prague and a number of branches throughout the country.
2. Posista, at Plzen, a special enterprise for the construction of airfields.
3. Armabeton, at Prague and Olomouc, engages in construction of border fortifications and military warehouses.
4. Armaprojekt, at Bratislava and Kosice, engages in airfield and other military construction.
5. Armastav, at Plzen.
6. Severostav, at Hradec Kralove and Liberec.
7. Marastav, at Prerov.
8. Stavoindustry, at Bratislava.

III. Postwar Construction.

By the end of World War II the construction industry of Czechoslovakia had been reduced to only a small fraction of its prewar strength, and construction activity in 1945 and 1946 was at a virtual standstill. With the advent of organized economic planning under the Two Year Plan, construction manpower was expanded rapidly and the volume of construction increased sharply.

The Two Year Plan called for construction output of 51.7 billion koruny (in Plan prices of 1 January 1947).* 22/ In 1948 it was

* Figures in koruny can be converted to US dollar equivalents at the rate of 50 koruny to US \$1. On 1 June 1953 the koruna was revalued

S-E-C-R-E-T

planned that construction would total 29.2 billion koruny, 23/ about 22 percent above the estimated value of construction in 1938. For the 2-year period, however, the Plan was fulfilled by only 77.4 percent. The planned and actual volumes of construction during the Two Year Plan in prices of 1 January 1947 are as follows 24/:

<u>Year</u>	<u>Value</u> <u>(Billion 1947 Koruny)</u>		
	<u>Planned</u> <u>Construction</u>	<u>Actual</u> <u>Construction</u>	<u>Percent</u> <u>of Fulfillment</u>
1947	22.54	15.41	68.4
1948	29.20	24.66	84.5
Total	<u>51.74</u>	<u>40.07</u>	77.4

Construction in 1947-48 was directed mainly toward housing and public works rather than toward industrial expansion. Industrial construction was largely limited to rehabilitation of such basic industries as coal, power, iron and steel, and the manufacturing industries which suffered capital depletion during the German occupation. Industrial construction accounted for only 18.9 percent of total construction output in 1947-48, with slightly over half of all industrial construction for the light and consumer goods industry. 25/ The greatest single effort was directed to relieving a shortage in housing caused by wartime destruction and a backlog of demand resulting from the sharp curtailment of housing construction during World War II. Housing construction accounted for slightly more than one-third of total construction in 1947-48. 26/ The distribution of construction output among major economic sectors during the Two Year Plan is shown in Table 2.*

The First Five Year Plan provided for capital investment of 336.2 billion koruny, of which construction was to account for 176.9 billion koruny, or 52.6 percent. 27/ As was true during the Two Year Plan,

and the official rate was set up at 7.20 koruny to US \$1. These are not market-determined rates but are official rates set by the government and may not reflect the true dollar value of the currency.

* Table 2 follows on p. 11.

S-E-C-R-E-T

Table 2

Distribution of Construction Output in Czechoslovakia
During the Two Year Plan a/
1947-48

<u>Sector</u>	<u>Percent</u>		
	<u>1947</u>	<u>1948</u>	<u>Planned</u>
Industry	14.5	21.6	18.9
Agriculture	3.2	3.2	3.2
Transportation	20.3	15.5	17.2
Housing	33.3	34.4	34.0
Public works	28.7	25.3	26.7
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

a. 28/

and largely for the same reasons, this planned ratio of construction to investment was exceeded, with construction accounting for about 60 percent of capital investment.

During the First Five Year Plan, emphasis was shifted from development of light industry, which had supported a relatively high living standard and provided the principal exports to the West, to development of heavy industry. According to the original version of the First Five Year Plan published in 1948, industrial construction was to account for 25.2 percent of total construction output as compared with 18.9 percent during the Two Year Plan. The share of total construction going to agriculture was increased to 6.7 percent as compared with 3.2 percent during the Two Year Plan, whereas the proportion of total construction going to housing and transportation was to decline. The planned distribution of construction output during the First Five Year Plan is given in Table 3.*

The original goals of the First Five Year Plan were revised upward sharply in 1951 after the outbreak of the Korean War. The original goal for capital investment was increased to 558 billion koruny, and

* Table 3 follows on p. 12.

S-E-C-R-E-T

Table 3

Distribution of Construction Output in Czechoslovakia
During the First Five Year Plan a/
1949-53

<u>Sector</u>	<u>Value</u> <u>(Billion Koruny)</u>	<u>Percent</u>
Industry	44.6	25.2
Public works	41.1	23.2
Housing	39.3	22.2
Transportation	23.1	13.1
Institutional public buildings	14.4	8.1
Agriculture	11.8	6.7
Trade and other services	1.9	1.1
Building industry	0.7	0.4
Total	<u>176.9</u>	<u>100.0</u>

a. 29/

the structure of investment was altered to increase the emphasis on development of heavy industry, particularly engineering. 30/

50X1
50X1

In the economic Plans for 1954 and 1955, under the impetus of the "new course," the growth rate of heavy industry was reduced, and a larger share of investment funds was applied to housing, agriculture, and other measures to improve living standards. The new Five Year Plan beginning in 1956, however, restores the priority position of heavy industry in the development of the economy.

50X1

Data on the actual value of construction output achieved in the various sectors since 1948 are not available. The relatively low degree of Plan fulfillment in housing and agricultural construction in comparison with over-all Plan fulfillment indicates, however, that scarce construction resources were probably diverted from these areas to targets in industry having higher priority. Thus it is likely that industry received a larger share of construction output than was envisaged in the economic Plans.

S-E-C-R-E-T

The construction industry in Czechoslovakia has achieved a significant growth in volume of construction output since 1947. Construction output increased by 60 percent from 1947 to 1948. An increase in output of 130 percent was achieved during the First Five Year Plan, and in 1956 a further increase of 18 percent above the level of 1953 was achieved. The volume and growth of construction in Czechoslovakia, 1938 and 1947-56, is shown in Table 4.

Table 4

Volume and Growth of Construction in Czechoslovakia
1938 and 1947-56

<u>Year</u>	<u>Index ^{a/}</u> <u>(1955 = 100)</u>	<u>Value</u> <u>(Billion Koruny) ^{b/}</u>	<u>Percent of Increase</u> <u>over Previous Year</u>
1938	42 ^{c/}	7.7 ^{d/}	
1947	25 ^{d/}	4.6 ^{d/}	
1948	40	7.3	60
1949	51	9.4	28
1950	61	11.2	20
1951	67	12.4	10
1952	80	14.6	19
1953	92	16.8	15
1954	96	17.6	5
1955	100	18.3	4
1956	109 ^{e/}	20.0 ^{f/}	9 ^{g/}

b. Believed to be in terms of 1953 prices, because the increase in 1953 above the level of 1948 in the preceding source is identical to that given in the 1949-53 Plan fulfillment report, which was given in 1953 prices. (See Methodology, Appendix B.) On 1 June 1953 the koruna was revalued, and the official rate was set at 7.20 koruny to US \$1.

c. ^{33/}

d. See Methodology, Appendix B.

e. ^{34/}

f. ^{35/}

g. ^{36/}

50X1

S-E-C-R-E-T

Despite the continued growth in construction output, the construction industry persistently failed to fulfill its Plan goals. Only in 1952 and 1953 is there any evidence that the construction plan was fulfilled. Plan fulfillment reports for these years indicate fulfillment by enterprises subordinate to other ministries. The degree of fulfillment of the plan for construction output in 1950-51 and 1954-55 is as follows:

<u>1950</u>	<u>1951</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>
95.0 <u>37/</u>	92.5 <u>38/</u>	94.5 <u>39/</u>	93.0 <u>40/</u>	92.0*

Failure by the construction industry to fulfill Plan goals is to some extent a reflection of the unrealistic goals assigned it by the economic planners. The practice of having simultaneously more projects under construction than could be adequately supplied with the necessary resources resulted in numerous delays in construction. Probably more significant, however, were poor organizational work in the industry, a high rate of labor turnover, and excessive absenteeism, along with shortages of materials. The industry failed to make the most efficient utilization of resources and thus failed to achieve the desired levels of productivity. This failure is clearly illustrated by figures in Table 5** which show the average utilization time of machinery and equipment on construction in Czechoslovakia, 1953-55.

Perhaps more significant than the low rate of utilization of machinery shown above is the failure to achieve any significant improvement for most types of machinery from 1953 to 1955. This failure to utilize efficiently available machinery can be attributed to poor organization of construction work, inadequate maintenance, and the excessive time required for repairs. 42/

The Second Five Year Plan calls for an increase in the over-all volume of construction of 60 percent by 1960. The construction enterprises of the Ministry of Construction are apparently to assume a greater role in the industry because the planned increase in output for these enterprises is 85 percent. 43/ About four-fifths of the increase in total output is to be achieved by increased labor

50X1

* Computed from the planned increase of 18 percent in 1956 and the actual increase of 9 percent shown in Table 4
(p. 13, above).

50X1

** Table 5 follows on p. 15.

S-E-C-R-E-T

Table 5

Average Utilization Time of Machinery and Equipment
in Construction Work in Czechoslovakia a/
1953-55

<u>Type of Machinery</u>	<u>Percent</u>		
	<u>1953</u>	<u>1954</u>	<u>1955</u>
Shovel excavators	46.7	43.9	49.9
Scrapers	43.2	35.2	34.6
Bulldozers	50.0	46.2	53.9
Dumpers	42.3	32.2	33.6
Cement mixers (over 500 liters)	37.7	33.2	35.3
Loaders	35.3	44.7	49.5
Unloaders	24.9	29.8	33.6
Cranes	51.8	52.9	51.9

a. 44/

productivity, which must rise by 54 percent according to the Plan. 45/
It is planned to increase the number of workers in construction by
only 20 percent by 1960. 46/

IV. Construction in Major Economic Sectors.

A. Industry.

Certain branches of heavy industry in Czechoslovakia, particularly machine building, were expanded by the Germans during World War II to produce war materials. Production of consumer goods, on the other hand, was restricted, so capital depletion in consumer goods industries was not large. These developments, together with the exodus of the Sudeten Germans, left Czechoslovakia at the end of the war with a relatively high per capita stock of capital. 47/ Thus the need was not felt for an extensive program to develop industry in the earlier years of economic planning, and a greater portion of new investment was directed to housing, public works, and light industry than in the other European Satellites.

S-E-C-R-E-T

The program of industrial expansion initiated by the First Five Year Plan required a construction effort of considerable magnitude, with the major emphasis on construction of facilities for heavy industry. Expansion and new construction of production facilities in heavy industry have fundamentally altered the structure of Czechoslovak industry. By 1953, production in the machine building industry had increased 3.3 times above 1948 production, compared with an increase in gross industrial production of 102 percent. 48/ In addition to the reconstruction and expansion of existing plants, 24 new machine building plants were constructed during the First Five Year Plan alone. 49/

Production capacity in the metallurgical industry was expanded significantly during the First Five Year Plan. Partly through improved production technique, but for the most part through the construction of new capacity, production of major products in ferrous metallurgy was increased during the First Five Year Plan as follows: pig iron, 69 percent; raw steel, 67 percent; rolled materials, 73 percent; steel tubing, 74 percent; and ferroalloys, 380 percent. 50/ In 1949-53, 6 blast furnaces, 9 open hearth furnaces, 8 electric furnaces, 6 roll trains, 2 pipe rolling stands, and other equipment were constructed and put into operation. 51/ The most important construction project in the field of ferrous metallurgy was the Nove Hute Klementa Gottwald Iron and Steel Works at Kuncice, near what is presently the largest such works in the country at Vitkovice. This project is to be expanded during the Second Five Year Plan (1954-58) to become the largest iron and steel works in Czechoslovakia. 52/ Construction of another large metallurgical combine at Kosice, in Eastern Slovakia, was started during the First Five Year Plan. Economically this projected combine was poorly located in an area having only soft coal and no large deposit of iron ore. Furthermore, difficulties in construction resulted from the fact that the soil was unsuitable for the heavy structures required for the project. 53/ Construction activity was curtailed in 1953, and early in 1954 technicians at the project were assigned to other projects, 54/ indicating that construction may have been permanently abandoned. Significant achievements in the development of nonferrous metallurgy since 1948 include the construction of an aluminum factory at Svaty Kriz nad Hronom, the first in Czechoslovakia, 55/ and a large magnesium plant in the Gemer region of central Slovakia. 56/

A significant portion of industrial construction since 1949 has been that for the chemical industry, which by the end of the First Five Year Plan had increased its production 138 percent above the 1948 level. 57/

S-E-C-R-E-T

A plastics plant at Bratislava, a cellophane and paper factory at Ruzomberok, and an oxygen plant at Podbrezova were constructed during the First Five Year Plan, and a plant at Novaky producing poison gas, plastics, and caustic soda was expanded. In 1952, construction was started at Podunajske Biskupice, near Bratislava, on what is to be the largest refinery in Czechoslovakia. 58/ Two new factories for the production of synthetic fibers were constructed, and a number of others were rebuilt or expanded. 59/ In 1955 a large cellulose plant to produce cellulose from beechwood was put into operation in Hencovce. 60/ In addition, new facilities were provided for the production of penicillin and other drugs, sulfuric acid, and phosphate and nitrogenous fertilizers.

A serious shortcoming in the industrial buildup of Czechoslovakia during the First Five Year Plan was the failure to increase production in the basic materials and power industries sufficiently to meet the needs of an expanding industrial economy. This failure reflects both deficiencies in planning and construction work and the higher priority assigned to machine building and metallurgy in the allocation of construction resources. In the mining of coal and iron ore the primary emphasis was given to mechanization and to improving the efficiency of utilization of existing facilities. 61/ Planned construction in the coal mining industry, although relatively small, was only 70 percent fulfilled during the First Five Year Plan. 62/ The regime has attributed the low fulfillment of the construction plan largely to a lack of proper geological research and to poor performance by the construction industry. It is probable, however, that an unwillingness to divert construction resources from the priority sectors of machine building and metallurgy was a significant factor contributing to the underfulfillment of the plan. Increases in capacity in coal mining were accomplished mainly by reconstruction and expansion of existing facilities. Only 2 brown coal mines and 1 lignite mine were constructed and put into operation during the First Five Year Plan. 63/

Beginning in 1954, measures were taken to overcome the serious production lags which had developed in basic industries as a result of the priority given to the development of the machine building industry. In 1954 and 1955 the rate of development in machine building was reduced, and greater attention was directed to building up the fuels, power, and raw materials base. 64/

S-E-C-R-E-T

Although a large number of new installations have been constructed for light industry, this sector has consumed a minor portion of construction resources since 1948. A significant portion of construction activity in this sector has been devoted to mechanization and installation of new equipment in existing plants rather than to construction of new facilities. Among the more important new installations constructed for light industry were 5 flax-breaking plants and 2 flax-retting plants, among others, for the textile industry. For the woodworking industry, eight sawmills and a number of facilities for the manufacture of furniture were constructed. The construction of 10 large freezing plants, 46 operational refrigeration plants, 30 dairies, 5 milk-drying plants, 9 large slaughterhouses, 7 large bakeries, and 1 sugar factory helped to promote an increase in production by the food industry of 83 percent during the First Five Year Plan. 65/

The Second Five Year Plan continues the emphasis on expanding production in heavy industry as the basis for the rapid development of the national economy. The previous pattern of investment in heavy industry is altered, however, to favor the buildup of basic industries. Planned increases in production by the machine building industry are to be accomplished mainly by increased mechanization and specialization of production rather than by construction of new capacity. During the Second Five Year Plan the basic task of investment construction is to provide new productive facilities for the fuel, power, chemical, iron and steel, and building materials industries. 66/ Planned investment in these basic industries is more than 80 percent above actual investment in the period 1951-55, compared with an increase in total planned investment of 61.5 percent. 67/

The Second Five Year Plan calls for a volume of investment in the solid fuels industry 115 percent greater than in the period 1951-55. 68/ Planned construction includes 6 new mines for coking coal and 4 coal washing plants in the Ostrava-Karvina region. Ten new mines are to be constructed in the Most area. In the Sokolovo district, 3 coal mines, 1 sorting plant, and 2 briquette plants are to be built. In addition, 9 lignite mines are to be constructed in southern Moravia and 4 in Slovakia. 69/

In the metallurgical industry, 6 rolling mills with a capacity of 1.3 million tons,* a pipe mill with a 70,000-ton capacity, 2 blast

* Tonnages are given in metric tons throughout this report unless otherwise indicated.

S-E-C-R-E-T

furnaces, 5 open-hearth furnaces, and 2 coke batteries are to be constructed during the Second Five Year Plan. In addition, construction will begin on a continuous sheet rolling mill and a plant for production of cold rolled strips. 70/ Of the above installations, the 2 blast furnaces, the 5 open-hearth furnaces, the 2 coke batteries, and 4 rolling mills will be constructed at the Nove Hute Klementa Gottwald Plant at Kuncice. 71/

Construction of the refinery at Podunajske Biskupice, which was started in 1952, will continue to be a priority project of the chemical industry during the Second Five Year Plan. Present plans call for the first section of the refinery to begin operations in January 1958, but the entire combine will not be completed until 1962. 72/ Another priority objective is the completion of the Slovak National Uprising Plant for the production of alumina at Ziar nad Hronom, near the new aluminum plant at Svaty Kriz nad Hronom. 73/ Production of synthetic fertilizers will be substantially increased by the construction of new plants to produce ammonia and phosphate and nitrogenous fertilizers. 74/ Among other important construction projects planned for the chemical industry are a plant for production of polyamide fibers for the textile industry, a cord silk plant at Lovosice, a plant for the production of synthetic rubber, and a benzol and tar-processing plant. 75/

B. Electric Power.

The rapid industrial expansion in Czechoslovakia since World War II has required an extensive construction program to increase the capacity for production of electric power. Primarily through the construction of new powerplants, the production of electric power was increased roughly two and one-half times between 1945 and 1955.* In 1948, the last year of the Two Year Plan, production reached 7.7 billion kilowatt-hours (kwh), about 74 percent more than in 1945. 76/ By 1955, production of electric power had reached 15.0 billion kwh, about 95 percent more than in 1948. 77/

Although capacity for generating electric power has been increased substantially, production throughout the postwar period has

* Figures for the increase in installed capacity, if available, would be a better measure of the extent of construction activity, because production figures reflect changes in utilization time of equipment. It is believed, however, that annual utilization time did not change significantly, and that production figures reflect reasonably accurately the relative increase in installed capacity.

S-E-C-R-E-T

failed to meet the requirements of the economy and the population. This failure has most often been attributed by the authorities to weaknesses in the construction industry. A common complaint has been that construction time is too long and that new plants are not put into operation when planned. Such basic weaknesses in the construction industry as poor organization of work, absenteeism, labor turnover, and inefficient use of equipment have been limiting factors in electric power construction as in all other types of construction. The electric power sector, however, offers a particularly good example of the harmful effects of overplanning. Relatively large amounts of manpower and materials are required for construction of electric powerplants, particularly hydroelectric powerplants. Supplies of construction manpower and materials were not sufficient to assure continuous operation on the numerous plants under construction simultaneously. The results were delays in construction, higher costs than anticipated, and failure to commission projects when planned. Furthermore, completion of projects was sometimes delayed by the inability of the machine building industry to deliver the necessary equipment.

During the Second Five Year Plan, measures are to be taken to overcome the bottleneck in production of electric power. A greater proportionate share of construction effort and resources than in previous years is to be devoted to construction of power facilities, and the production of power-generating equipment is to be increased to supply the new facilities. 78/ The Plan calls for the construction of 2,300 megawatts (mw) of new capacity in the period 1956-60, thereby enabling an increase in production of electric power of 68.5 percent to more than 25 billion kwh in 1960. 79/

Thermal electric powerplants constitute the bulk of the new electric power capacity constructed and put into operation through 1955. Thermal electric plants have provided nearly nine-tenths of total production of electric power throughout the postwar period. 80/ In addition to numerous small plants to supply individual industrial enterprises, six large thermal electric powerplants were constructed before the beginning of the Second Five Year Plan. Among these the most important were at Porici (Porici I), Hodonin (Hodonin I), Novaky (Novaky I), and Bron. 81/

50X1

The largest thermal electric powerplant in Czechoslovakia, with a capacity of 300 megawatts, is to be constructed at Opatovice. The first 50-mw turbo-aggregate is scheduled to go into operation at this plant in 1959. 83/

50X1

- 20 -

S-E-C-R-E-T

S-E-C-R-E-T

During the First Five Year Plan, Czechoslovakia initiated a long-range program for development of its unharnessed potential for production of hydroelectric power. Between 1949 and 1955, construction of a number of major hydroelectric projects was started, mainly on the Vltava and Vah Rivers. Of 6 hydroelectric powerplants constructed before 1956, the 2 most important were a plant at the Slapy Dam on the Vltava and another on the Orava River, a tributary of the Vah. 84/ The Slapy plant, with a capacity of from 120 to 140 mw, is the first hydroelectric plant in Czechoslovakia with a capacity of more than 100 mw. 85/ On the Vltava, major hydroelectric powerplants are presently under construction at the Lipno and Orlik dams. The Lipno plant, to be completed during the Second Five Year Plan, is to have a capacity of 120 mw. 86/ Initial operations at the Orlik plant, which will be the largest in Czechoslovakia, are scheduled to begin in 1961. 87/

Extensive development of hydroelectric power has been under way on the Vah River to improve the power supply in Slovakia. Under construction at the beginning of 1956 and scheduled for completion during the Second Five Year Plan were plants at Nosice, Skalka, Krpelany, and Sucany, with a combined capacity of 140 mw. 88/ Major powerplants are to be constructed and put into operation on the Vah at Lipovec and Madunice during the Second Five Year Plan. In addition, the Hricov, Miksova, and Povazska Brystrica cascades on the Vah and the accompanying Ruzin hydroelectric powerplant are to be developed during the Second Five Year Plan. 89/

The program of hydroelectric power construction, although impressive, will not significantly alter the proportions of total power supplied respectively by hydroelectric and thermal electric powerplants by 1960. New plants planned for completion during the Second Five Year Plan will increase the installed capacity of hydroelectric powerplants by only about 400 mw, 90/ or about 17 percent of the total planned increase in electric power capacity of 2,300 mw.

Considerable advantage could have accrued from a more rapid development of production of hydroelectric power in the form of lower production costs per kilowatt-hour and, more significantly perhaps, reduced pressure on overburdened coal supplies. As a matter of economic necessity, however, the development of hydroelectric power has had to be pursued as a long-range project. The rate of expansion of hydroelectric power facilities has probably been controlled largely by the following two considerations: (1) hydroelectric plants require

S-E-C-R-E-T

more manpower and materials for constructed units of installed capacity, a longer period of construction, and higher initial costs than do thermal electric plants; and (2) with the shorter period required for construction, thermal electric plants could more quickly meet the pressing demand for electric power.

C. Transportation.

Increases in the volume of rail traffic in Czechoslovakia since the end of World War II have been accomplished mainly through improved efficiency of operations and greater utilization of existing facilities. In Czechoslovakia, as in the other European Satellites, the practice has been to achieve the maximum degree of utilization with the least possible capital outlay. From the end of the war until 1955, there was no appreciable expansion of the railroad network in Czechoslovakia. 91/ Construction activity in rail transport has been directed primarily to strengthening, modernizing, and double tracking existing lines rather than to construction of new routes. Economically, the most important achievement was the double tracking of the "Friendship Line" from Zilina in western Slovakia to Cierna on the Soviet border. 92/ Before World War II the only direct rail connection between eastern and western Czechoslovakia was the single-track, low-capacity line between Zilina and Kosice. Construction of the second track of the "Friendship Line" was completed in 1955 93/ and provided a first-class east-west link between Prague and Cierna. In view of the industrialization of Slovakia and the reorientation of Czechoslovak foreign trade toward the USSR, the "Friendship Line" is of major economic importance.

During the First Five Year Plan a program for electrification of railroads was begun, but no great progress had been made by 1955. The only major section electrified was the 165-kilometer (km) section of the "Friendship Line" between Zilina and Spisska Nova Ves. This project was started in June 1949 and commissioned in February 1956. 94/ Electrification of the 165-km Prague - Ceska Trebova line (a part of the Prague-Cierna line) was started in 1951 and was scheduled for completion in 1954. 95/ Numerous difficulties were encountered in construction, however, and electrification of this line is now scheduled for completion in 1958. 96/

Construction in the field of rail transportation during the Second Five Year Plan will be concentrated on electrification and continued improvement of existing lines. The Plan calls for

S-E-C-R-E-T

the electrification of 750 km of railroad lines in the period 1956-60. 97/ Effort will be directed mainly to the electrification of the entire Prague-Cierna line, which is to be completed by 1960. 98/ Other lines to be electrified include the following: Hranice-Bohumin, Prague - Usti nad Labem, Usti nad Labem - Nymburk - Kolin, and Nymburk-Poricany. 99/ During the Second Five Year Plan, new rails capable of withstanding axle loads of from 18 to 20 tons are to be installed on 3,860 km of line, 100/ and automatic block signaling is to be installed on 282 km of line. 101/ The yearly volume of general repair of lines is to increase from 600 to 900 km during the Second Five Year Plan. 102/

Construction of new highways in Czechoslovakia since the end of the war has been of only minor significance. Activity has been confined almost entirely to modernization, improvement, and maintenance of the existing road net, a pattern which is to continue during the Second Five Year Plan. Principal measures planned for improvement of the highway net in the period 1956-60 are the paving of 15,000 km of roads, improvement of 50 percent of the existing gravel roads, and increasing the percentage of dust-free roads from 24 percent to 26 percent of the road network. 103/

D. Housing.

Czechoslovakia faced a serious housing shortage at the end of World War II. War damage to housing was comparatively light, amounting to only about 3 to 4 percent of existing housing stocks. The major cause of the shortage was the almost complete halt of renovation and new construction during the war years. As a result of the rapid industrialization of Czechoslovakia in the postwar years, the shortage of housing became particularly acute in urban areas, as workers migrated from the countryside to the growing industrial centers. The continuing shortage of housing, because of its adverse effects on labor efficiency and stability, is a major economic problem confronting the regime in Czechoslovakia.

The most significant failure of the construction industry in Czechoslovakia since the war, in terms of Plan fulfillment, has been in the field of housing construction. New housing constructed since 1947 has fallen far below the needs of the country as estimated in the economic plans. Not until 1952 did the dwelling units constructed

S-E-C-R-E-T

reach the level of the immediate prewar years.* Available statistics indicate that the number of dwelling units made available in the entire postwar period has kept pace only with the needs created by population growth. Moreover, the major indexes of quality of housing -- size of apartments, residents per apartment, residents per room, and average area per resident -- declined between 1950 and 1955. 104/

The bulk of all housing constructed in the postwar period has consisted of workers' housing (apartments or dwelling units) constructed by the socialized sector, primarily in industrial areas. Failures in the state housing construction program led, however, to increased emphasis on private construction by individuals beginning in 1954. The total volume of housing constructed in Czechoslovakia, 1948-56, is shown in Table 6.

Table 6

Volume of Housing Construction in Czechoslovakia a/
1948-56

<u>Thousand Dwelling Units</u>			
<u>Year</u>	<u>State Sector</u>	<u>Private Sector</u>	<u>Total</u>
1948	11.9	9.8	21.7
1949	19.6	9.5	29.1
1950	29.1	9.1	38.2
1951	22.3	8.6	30.9
1952	30.3	8.9	39.2
1953	29.7	9.3	39.0
1954	27.8	10.4	38.2
1955	35.2	15.4	50.6
1956	32.0 <u>b/</u>	17.0	49.0 <u>b/</u>

a. 105/. These data do not represent net additions to housing stock, because no account is taken of withdrawals. Czechoslovak figures reveal, for instance, that in 1950-55, 1 dwelling unit was wrecked for every 5.7 which were built. 106/

b. 107/

* The number of dwelling units constructed in 1950 actually reached the prewar level, but declined sharply in 1951. Only since 1952 has the number of units constructed equalled or surpassed the prewar level on a sustained basis.

S-E-C-R-E-T

Plan goals for construction of workers' housing by the socialized sector have been underfulfilled by substantial margins since 1950. The original version of the First Five Year Plan called for construction of state housing at the average rate of 26,000 dwelling units per year, 108/ a goal which assessed fairly realistically the capabilities of the construction industry. As indicated in Table 6,* new construction by the state in the years 1949 and 1950 averaged 24,350 dwelling units annually, about 94 percent of the planned annual average for the 5 years of the Plan. The Plan was revised sharply upward in 1951, however, assigning the following goals, in number of dwelling units for the years 1951-53 109/:

<u>Year</u>	<u>Number of Dwellings</u>
1951	37,000
1952	44,000
1953	52,000
Total	<u>133,000</u>

This upward revision of housing goals reflected the need for new workers' housing which would result from the accelerated industrial development provided for in the 1951 Plan revision. Actual construction by the state during the period 1951-53, however, amounted to only 82,300 dwelling units (see Table 6*), or about 62 percent of the Plan goal of 133,000 dwelling units.

Apparently under the impetus of the "new course" policy originated in the Soviet Bloc in 1953, the regime announced that in 1954 housing construction by the state would total 40,000 dwelling units, 110/ an increase of slightly more than one-third above actual achievement in 1953. The Plan was fulfilled by only about 70 percent, however, and fewer dwelling units were constructed than in 1953. It appears that an original Plan for construction of 48,000 dwelling units in 1955 was revised downward to 40,000 111/ as a result of the poor performance in 1954. Even this reduced Plan goal, however, was fulfilled by only 88 percent.

The regime has been able to provide even this inadequate number of new apartments only by progressively building smaller units.

* P. 24, above.

S-E-C-R-E-T

The number of total square meters (sq m) of dwelling units constructed affords a better measure of the physical volume of state housing construction than does the number of dwelling units. The average size of state-constructed apartments, measured in terms of inhabitable space, was reduced from 57.1 sq m in 1948 to 35.4 sq m in 1955. The total area of inhabitable space in dwelling units constructed by the state in Czechoslovakia, 1948-55, is shown in Table 7.

Table 7

Number and Average Size of Dwelling Units and Total Area of Housing Constructed by the State in Czechoslovakia a/ 1948-55

<u>Year</u>	<u>Number of Dwellings (Thousand Units)</u>	<u>Average Inhabitable Space b/ (Square Meters)</u>	<u>Total Inhabitable Space c/ (Thousand Square Meters)</u>
1948	11.9	57.1 <u>d/</u>	679.5
1949	19.6	N.A.	N.A.
1950	29.1	53.0	1,542.3
1951	22.3	48.0	1,070.4
1952	30.3	39.5	1,196.9
1953	29.7	37.7	1,119.7
1954	27.8	35.9	998.0
1955	35.2	35.4	1,246.1

50X1

b. Rooms measuring 4 sq m or more in area and kitchens measuring 12 sq m or more in area are included as inhabitable space in this table. The usage is somewhat ambiguous because, for example, a 3-room apartment may include 3 rooms with no kitchen, 3 rooms and a kitchen less than 12 sq m in area, or 2 rooms with a kitchen 12 or more sq m in area.

c. Obtained by multiplying columns 1 and 2.

d. 113/

The poor performance in the field of state housing construction reflects the low priority assigned to this sector in the allocation of construction resources, particularly manpower. The Plan goals

S-E-C-R-E-T

for housing construction were apparently predicated on a rapid advance in construction technology -- the use of assembly-line methods, panel construction using prefabricated sections, and increased mechanization -- as a means of raising productivity and overcoming the labor shortage. The proposed advances were not achieved, however, either in the development of technology or in the production of prefabricated elements. In addition, the standard deficiencies such as labor turnover, excessive absenteeism, and inefficient utilization of resources contributed to the low incidence of Plan fulfillment in state housing construction.

In an attempt to offset to some extent the deficiencies in state housing construction, the regime in recent years provided increased incentive to individuals to build their own homes, as indicated by the sharp rise in the number of private houses constructed since 1954. Such incentives take the form of bank loans at low interest rates, materials supplied by the state at wholesale prices, and technical assistance. 114/ This policy is intended as a measure to secure needed housing without putting an additional strain on short supplies of construction manpower, because the individual must supply his own labor and cannot employ workers from the socialized construction sector. 115/

There appears to be little possibility of improvement in the basic indexes of quality of housing in Czechoslovakia by 1960. Although the Second Five Year Plan calls for the construction of roughly 50 percent more dwelling units than were constructed in the period 1951-55, achievement of this goal will do no more than maintain the indexes at the unsatisfactory levels prevailing in 1955. It has been estimated that a minimum yearly average of 62,000 dwelling units must be constructed in the period 1956-60 to meet the needs created by the estimated growth in the number of households. 116/ The Second Five Year Plan calls for construction of 300,000 dwelling units (250,000 by the state and 50,000 by individuals), 117/ a yearly average of 60,000 dwelling units. The 1956 Plan provided for construction of 42,000 dwelling units by the state, an increase of nearly 20 percent above achievement in 1955.* It appears that the Plan was revised downward to 35,600 dwelling units in March 1956, 119/ probably as a result of poor Plan fulfillment during the first quarter. Even this

* Estimated from the announced Plan for construction of 1.5 million sq m of dwelling space as reported in source 118/, on the assumption that the average size of dwelling units remained the same as in 1955 (35.4 sq m).

S-E-C-R-E-T

revised goal was fulfilled by only about 90 percent, however, as only 32,000 dwelling units were constructed in 1956.

V. Major Inputs.

A. Manpower.

The program of reconstruction and industrial expansion in Czechoslovakia beginning in 1947 required a rapid growth in the size of the construction labor force, which had been badly depleted during World War II. Average yearly employment in construction increased sharply in 1947 and 1948 and then grew at a declining rate through 1953. Over-all employment in construction increased by about 60 percent from 1948 to 1953. The number of workers engaging in actual production work increased by only a little more than 50 percent, however, and employment in planning, design, and administration more than doubled. In 1955, average yearly employment in construction had dropped to about 3 percent below the 1953 level, with the entire decline being absorbed by the production sector. Manpower in the construction industry in Czechoslovakia, 1947-56, is shown in Table 8.*

The increase of approximately 50 percent in construction manpower since 1948 has been far from sufficient to meet construction requirements as outlined in the economic plans. A persistent shortage of labor, and particularly skilled labor, is officially recognized as the major limitation to a more rapid growth in the volume of construction output in the postwar period. The inability of the construction industry to retain adequate numbers of skilled workers or to increase significantly the proportion of skilled workers in the total has seriously impeded efforts to develop a stable and efficient construction labor force. At the beginning of 1955, skilled workers constituted only about one-third of total construction workers, compared with percentages ranging from 50 to 80 percent in other sectors of industry. 120/

The stagnation in the growth of employment in construction in recent years has resulted not so much from the lack of new recruits as from the inability of the construction industry to retain workers in industry once they are recruited. A major shortcoming of the construction industry is an excessive rate of labor turnover, with its disrupting effects on the production process. For example,

* Table 8 follows on p. 29.

S-E-C-R-E-T

Table 8

Manpower in the Construction Industry of Czechoslovakia a/
1947-56

Thousand Workers

<u>Year</u>	<u>Production Workers</u>	<u>Other <u>b/</u> Workers</u>	<u>Total</u>
1947	N.A.	N.A.	161 <u>c/</u>
1948	194	34	228
1949	237 <u>d/</u>	N.A.	N.A.
1950	258 <u>d/</u>	N.A.	N.A.
1951	277 <u>d/</u>	N.A.	N.A.
1952	291 <u>d/</u>	N.A.	N.A.
1953	294	70	364
1954	288	75	363
1955	277	76	353
1956	287	78	365
1st quarter	265	76	341
2d quarter	287	76	363
3d quarter	299	78	377
4th quarter	298	79	377

[Redacted]

50X1

b. Probably refers to employees in planning, design, and administration.

c. 122/

[Redacted]

50X1

it was reported that in 1954 90,000 workers were recruited by the construction industry, but 100,000 workers left the industry for other employment. In the period January - October 1955, 64,000 workers were recruited, but 74,000 left the industry. 124/

S-E-C-R-E-T

A number of factors contribute to the high rate of labor turnover in construction, the foremost of which is probably concerned with wages. Available information indicates that as a rule average wages in construction compare unfavorably with those in certain other branches of industry. Workers are thus lured from construction by the prospect of higher wages in other types of employment. As an example, it is reported that in the Ostrava industrial region, average wages in construction of from 1,400 to 1,500 koruny per month compare with rates of from 2,000 to 2,100 koruny per month for steel workers and from 2,500 to 3,000 koruny per month for coal miners. 125/ Within the industry itself a further disrupting factor is the wide variation in wage rates for similar types of work between different construction projects. 126/ Apparently it has been the practice to offer above-average wages for workers on high-priority projects, thus giving rise to disrupting labor movements within the industry itself. Furthermore, a wage system which was inequitable with regard to relative payments for skilled and unskilled labor has created discontent, particularly among skilled workers. For example, it is reported that in 1955 a mason earned 23 percent more than a temporary worker and only 3.5 percent more than a digger (not further identified, but presumably common labor). Before World War II a mason earned 30 percent more than a temporary worker and 20 percent more than a digger. 127/

During 1956 the regime took steps to correct the inequities in the wage structure in the construction industry. Early in 1956 the Minister of Construction conceded that existing work norms were unrealistic, because they were based on the assumptions and experience of 1952. A new wages and norms system, purporting to provide qualitatively better work norms, was put into effect on 1 June 1956. 128/ The new program provided for increases in both work norms and wages. The announced purpose of the new system was to remove inequities in the wage structure by providing qualified workers with the opportunity to earn higher wages. There is evidence, however, that the new program was not accepted with enthusiasm by construction workers. There have even been reports that protest strikes were called by workers in various locations in the belief that the new system might in fact result in lower wages. 129/

The seasonal nature of construction is another major factor contributing to instability in the construction labor force. Large numbers of construction workers are released during the first quarter of the year, when construction activity is seasonally low, and are difficult to bring back after finding other employment. Other possible

S-E-C-R-E-T

factors contributing to the high rate of labor turnover are poor housing and cultural facilities for construction workers, the necessity of moving from project to project, and dissatisfaction over excessive idle time resulting from poor organization and management at construction sites.

In view of the limited possibilities for increasing employment in construction, increased productivity of labor has been of vital importance as a means of expanding construction output. The fact that the volume of construction increased by 130 percent during the First Five Year Plan, and construction manpower was increased by only a little over 50 percent, indicates the significant contribution of increased labor productivity to the growth in construction output. Worker productivity increased by 52 percent during the First Five Year Plan. 130/ Further increases of 6.8 percent, 8.8 percent, and 8.4 percent were reported in 1954, 1955, and 1956, respectively. 131/ Increases in labor productivity since 1948 have been accounted for primarily by greater mechanization and improved technology in construction. The rapid movement of skilled workers in and out of the construction industry seems to indicate that improvements in the technical levels of workers have not contributed significantly to the increase in labor productivity.

Growing mechanization, the greater use of assembly-line methods, and the increased use of prefabricated elements are the basis for projected increases in productivity during the Second Five Year Plan. In addition, increased attention is to be given to securing more efficient use of machinery and equipment by improving organizational work. The Second Five Year Plan envisages an increase in labor productivity by 1960 of 54 percent above the level of 1955, 132/ or an average annual increase of about 9 percent. Increased productivity is expected to account for four-fifths of the growth in construction output during the Second Five Year Plan. 133/

B. Materials.

Production of construction materials in Czechoslovakia has been expanded significantly since 1948 to meet the needs of expanding construction output. In 1955, production of cement and bricks, the two major construction materials, was 74.4 percent and 59.6 percent, respectively, greater than in 1948. The increases in production, however, have persistently failed to meet planned

S-E-C-R-E-T

goals. The original version of the First Five Year Plan called for a 62.5-percent increase in production of cement, from 1.7 million tons in 1948 to 2.6 million tons in 1953. In the 1951 Plan revision the 1953 goal for production of cement was raised to 3.4 million tons, an increase of 112.5 percent above the level of 1948. ^{134/} Actual production in 1953, however, reached only 2.3 million tons, 40 percent greater than in 1948 and only 68 percent of the revised Plan goal. Further increases in production of 10.4 percent, 12.9 percent, and 8.9 percent were achieved in 1954, 1955, and 1956, respectively, but the increase in each year failed to meet the production goal established in the economic Plan. ^{135/} Production of bricks by 1953 had reached the volume envisaged in the original version of the First Five Year Plan (there is no information on a revised goal for brick production), but production plans were not fulfilled in 1954 and 1955. ^{136/} Production of cement and bricks in Czechoslovakia, 1937 and 1948-56, is shown in Table 9.

Table 9

Production of Cement and Bricks in Czechoslovakia
1937 and 1948-56

<u>Year</u>	<u>Cement</u> <u>(Thousand Metric Tons)</u>	<u>Brick</u> <u>(Million Units)</u>
1937	1,273 ^{a/}	836 ^{a/}
1948	1,658 ^{a/}	924 ^{a/}
1949	1,761 ^{b/}	889 ^{b/}
1950	1,991 ^{b/}	1,015 ^{b/}
1951	2,112 ^{b/}	1,108 ^{b/}
1952	2,288 ^{b/}	1,278 ^{b/}
1953	2,320 ^{a/}	1,212 ^{a/}
1954	2,562 ^{a/}	1,320 ^{a/}
1955	2,892 ^{a/}	1,475 ^{a/}
1956	3,148 ^{a/}	1,592 ^{a/}

a. ^{137/}

b. ^{138/}

S-E-C-R-E-T

The degree to which production of building materials, particularly cement, fulfills domestic requirements is difficult to assess. Production in 1953 of only 68 percent of envisaged requirements for planned construction would appear to indicate that cement production has constituted a major bottleneck in the construction industry. As previously noted, however, construction plans have been overly optimistic, exceeding the capabilities of the economy not only with respect to materials production, but also with respect to the availability of manpower. It seems significant that official statements concerning over-all performance by the construction industry seldom refer to materials shortages as a major deficiency inhibiting fulfillment of construction plans. Although there are numerous references to cement shortages at individual construction sites, it is possible that such shortages result largely from maldistribution and/or excessive waste of cement at the site. Available evidence indicates that cement production has been adequate to meet the requirements of investment construction in the socialized sector but has not met the demand from prospective builders of private housing and farm buildings in the private sector of agriculture. It should be noted, however, that "requirements of investment construction," as used in this connection, refer to the quantity of cement that the construction industry was able to consume rather than to the quantity that would have been required to fulfill investment construction plans.

The Second Five Year Plan calls for continued expansion of production of building materials. Production of cement is planned to reach 4.5 million tons in 1960, 56 percent above the level of 1955, and production of bricks is to increase by 63 percent. 139/ Fulfillment of these plans for increased production of cement and bricks will be assured if the average annual rate of increase can be maintained at the level achieved in 1956. To support the planned increase in production of cement, production of installations for cement plants is to be increased by 197 percent by 1960, to 22,000 tons. 140/

VI. Equipment and Technology.

As the rate of growth in construction manpower in Czechoslovakia declined after 1950, mechanization of construction and improved technology became increasingly important in assuring the continued growth in construction output. Only by these means can Czechoslovakia attain the increases in productivity necessary to offset the lack of available manpower. The quantity of machinery and equipment supplied to the construction industry increased significantly by 1953. In that year,

S-E-C-R-E-T

compared with 1948, enterprises of the Ministry of Construction had twice as many dredges, 4 times as many scrapers, 2-1/2 times as many bulldozers, and 37 times as many cranes. 141/ The extent of mechanization achieved in certain basic operations in construction by 1955 is shown in the following tabulation 142/:

<u>Operation</u>	<u>Percent</u>
Earthwork	79.5
Plank and board work	22.4
Interior work	38.0
Assembly of prefabricated parts	73.7
Masonry work	37.0
Plastering	20.2
Concrete mixing	90.0 <u>143/</u>

Stocks of machinery and equipment in the construction industry will continue to increase during the Second Five Year Plan, but the main effort in this area will be to assure more efficient utilization by construction enterprises. Performance in this request has been exceedingly poor. Excessive idle time of available machinery and equipment has resulted from poor organization and management, as indicated in Table 5.* Improper maintenance and the excessive time required for repairs further contributed to the low rate of utilization of existing equipment. 144/ Thus despite significant additions to the equipment park, labor productivity increased at a rate slower than planned, and envisaged reductions in construction costs were not realized. 145/

The industrialization of construction has been a primary goal of the Czechoslovak construction industry since 1951. The large-scale application of prefabricated elements in construction affords the best possibility for increased labor productivity which, because of the scarcity of construction manpower, is vital to the continued expansion of construction output. A basic requisite of large-scale industrialization of construction is standardization, both of building plans and of specifications for prefabricated construction elements. Institutes of the Ministry of Construction began intensive research in 1951 looking to the development of standardization, particularly in the field of housing construction. 146/ Achievements in this field have been limited, however, by bureaucratic mismanagement. By the end of

* P. 15, above.

S-E-C-R-E-T

1955, standardization had not developed sufficiently to support a large-scale program of production and assembly of prefabricated elements, and the program remained largely in the experimental stage. The regime claims the construction with prefabricated wall panels of only 255 apartment units in 1955, and only 905 were planned for 1956. 147/ Experience gained in this field since 1951, however, should provide the basis for a large-scale development of industrialized construction during the Second Five Year Plan.

Successful application of industrialized methods of construction on a large scale is perhaps the primary task of the construction industry during the Second Five Year Plan. Czechoslovak experience has demonstrated that construction with prefabricated elements requires fewer workers and significantly increases labor productivity, a condition which is counted on strongly to compensate for the shortage of manpower. In addition, this method of construction affords other significant advantages in the form of reduced consumption of materials and shorter construction time. Table 10,* based on Czechoslovak experience, compares consumption of materials and construction time on similar projects constructed by standard and by industrialized methods. Further, prefabrication, by eliminating the wet-concrete process, will allow a greater volume of construction during the severe winter months of the first quarter of the year. By thus moderating the seasonal nature of construction, the use of prefabricated elements should contribute materially to greater stability and efficiency in the construction labor force.

Increased labor productivity and shorter periods of construction, however, were not accompanied by the expected reduction in construction costs where prefabricated elements were applied. In 1956 the cost of producing and transporting construction elements remained so high as to offset gains from greater productivity. 148/

The Second Five Year Plan envisages a rapid expansion in the application of industrialized methods of construction. It is planned that 21,000 apartment units (multiple unit buildings) will be built in 1960 with prefabricated sections and large wall panels, of which 7,000 will be completely prefabricated. 149/ Although construction with prefabricated elements has to date been oriented mainly toward housing construction, it is planned to apply this method on a broader scale to industrial construction as the Second Five Year Plan progresses.

* Table 10 follows on p. 36.

S-E-C-R-E-T

Table 10

Consumption of Materials and Period of Construction
in Standard and Prefabricated Construction in Czechoslovakia a/

Specifications	Kilograms per Cubic Meter	
	Standard Construction 11-Story House (Brick)	Prefabricated Construction 11-Story House (Assembled with Wall Panels)
Weight	600.0	380.0
Consumption of steel	6.4	3.0
Consumption of cement	30.0	35.0
Consumption of bricks	60.0	
Period of construction (months)	18.0	5.0

a. 150/

Production of prefabricated blocks and panels is to increase significantly to support the planned program of industrialization of construction. The principal emphasis will be on the expansion of construction with large wall panels. 151/ Large, complete wall panels are less costly to produce and can be assembled more cheaply and in less time. With the development of large-scale production and assembly of large wall panels, costs of construction with these elements may be expected to decline. Press statements by construction officials indicate that the problem of transporting large wall panels will be solved by developing production in plants near construction sites, particularly in the major industrial areas having a large and long-range demand for new construction. The success of the construction industry in achieving the construction goals of the Second Five Year Plan will depend to a very large extent on the degree of success in adapting its operations to industrialized methods.

VII. Conclusions.

Throughout the postwar period the investment construction program of Czechoslovakia has been characterized by faulty planning, a condition attributable largely to the centralization of authority over all

S-E-C-R-E-T

investment construction plans in the government ministries. The central planners in Czechoslovakia, as in most other Satellite countries, have tended to be overly optimistic concerning the capabilities of the economy in the field of investment construction. Central authorities were inclined to give more weight in economic plans to construction of large, new industrial enterprises than to modernization and expansion of existing facilities, and throughout the postwar period too many new projects were put under construction simultaneously. Thus not only were construction resources excessively dispersed, with the consequent delays in construction and higher costs, but also large amounts of resources were tied up in projects which could only mature over a long period of time. The contribution of the construction industry to the growth of the national economy in Czechoslovakia, although significant, would have been greater had the industry been able to concentrate its resources on a smaller number of projects which could more quickly be brought into production.

Faulty planning, however, has been only partly responsible for the persistent underfulfillment of construction plans. The growth in construction output since 1951 would have been greater had the construction industry taken full advantage of opportunities to increase its operational efficiency. Little was done, however, to improve the organization and management of construction or to more fully utilize machinery and equipment and improved methods of construction. The deficiencies in management largely accounted for the failure to achieve reductions in construction costs. The apparent lethargy of many enterprise managers in adopting technical advances and in assuring more efficient use of equipment cannot be adequately explained. A possible explanation, however, may be that the high degree of centralization of authority over most aspects of construction work is not conducive to initiative on the part of managers and foremen.

The directives of the Second Five Year Plan indicate a more realistic approach to the problems of investment construction than has prevailed in the past. Considerably more attention is to be given to the possibilities of increasing production by modernization, mechanization, and expansion of existing facilities. In the sphere of new construction, work will be concentrated on fewer projects and will thus make a more timely contribution to production. Such a program, if carried out, will result in a better allocation of resources and improved efficiency in the operations of the construction industry.

S-E-C-R-E-T

The goal of a 60-percent increase in construction output during the Second Five Year Plan does not appear excessive. Construction output in 1956, although it failed to fulfill the annual Plan, nevertheless increased to a greater extent (9 percent above the level of 1955) than in any year since 1953. An average annual increase of 10 percent in the years 1957-60 will assure the over-all 60-percent increase envisaged for the Second Five Year Plan. The decentralization program begun in 1956 should lead to improved planning, organization, and management of construction. With the improved technology now available, it appears probable that the construction industry will fulfill its assigned tasks by the end of the Second Five Year Plan.

S-E-C-R-E-T

APPENDIX A

CONSTRUCTION ENTERPRISES SUBORDINATE TO THE CZECHOSLOVAK MINISTRY OF CONSTRUCTION AND TO THE SLOVAK COMMISSARIAT OF CONSTRUCTION*

Enterprise	Location	Function
Ministry of Construction		
Main Administration for Industrial Construction		
Vystavba rudnych dolu a huti	Prague	Construction of ore mines and foundries
Vystavba duhnho a energetickoho zarizeni	Ostrava	Construction of mining and power installations
Vystavba chemickeho prumyslu	Usti nad Labem	Construction of chemical plants
Prumstav	Pisen	Industrial construction
Prumstav	Most	Industrial construction
Prumstav	Pardubice	Industrial construction
Prumstav	Brno	Industrial construction
Prumstav	Prostejov	Industrial construction
Teplotechna	Prague	Construction of central heating installations
Main Administration for Construction of Combines		
Vitkovicke stavby	Ostrava	Construction of large industrial complexes
Trinicke stavby	Trinec	Construction of large industrial complexes
Hukostav	Kosice	Construction of large industrial complexes
Hron	Svaty Kriz	Construction of large industrial complexes
Main Administration for Special Industrial Construction		
Stredoslovenske stavby	Zvolen	} these enterprises construct special industrial installations such as police installations, atomic installations, and plants with secret production plans.
Prumstav	Turc Svaty Martin	
Armabeton	Prague	
Prumstav	Vsetin	
Stavobet	Semin	

* 152. This list of 51 enterprises is based on information obtained in 1951. It is possible that enterprise names have been changed and that organizational shifts have occurred. Reports in 1955, however, still referred to the 51 enterprises under the jurisdiction of the Ministry of Construction and the Commissariat of Construction. Thus it is believed that the above list reflects reasonably accurately the number and functions of construction enterprises subordinate to these agencies. The indication of the function of the subordinate enterprises gives an approximate translation of the Czech and Slovak designations of these enterprises.

S-E-C-R-E-T

S-E-C-R-E-T

Enterprise	Location	Function
Ministry of Construction (Continued)		
Main Administration for Residential and Other Construction		
Bystove stavby	Most	Residential construction
Stavby sidlist	Ostrava	Residential construction
Pozemni stavby	Prague	Above-ground construction, probably including housing, public works, and possibly certain industrial structures
Pozemni stavby	Ceske Budejovice	
Pozemni stavby	Teplice	
Pozemni stavby	Havlickuv Brod	
Pozemni stavby	Brno	
Pozemni stavby	Gottwaldov	Installation works, possibly finishing work such as plumbing and wiring
Pozemni stavby	Opava	
Instalacni zavody	Plzen	
Main Administration for Engineering Construction		
Vodni stavby	Tabor	Hydraulic construction
Dopravni stavby	Prague	Transportation construction
Dopravni stavby	Havlickuv Brod	Transportation construction
Ingstav	Prague	Engineering construction
Ingstav	Brno	Engineering construction
Main Administration for Manufacture of Construction Materials		
Prefa	Prague	Manufacture of construction materials, types unknown
Prefa	Brno	Manufacture of construction materials, types unknown

S-E-C-R-E-T

S-E-C-R-E-T

Enterprise	Location	Function
Ministry of Construction (Continued)		
Main Administration of Supplies		
Staviva Staviva	Prague Bratislava	{ Possibly responsible for distribution of construction materials
Slovak Commissariat of Construction		
Main Administration for Industrial Construction		
Vystavba rudnych bani	Poprad	Construction of ore mines
Priemstav	Bratislava	Industrial construction
Priemstav	Zilina	Industrial construction
Priemstav	Kosice	Industrial construction
Main Administration for Residential and Other Construction		
Pozemni stavby	Bratislava	{ Above-ground construction, probably public works and possibly certain industrial structures
Pozemni stavby	Hitra	
Pozemni stavby	Banska Bystrica	
Pozemni stavby	Zilina	
Pozemni stavby	Presov	Installation works, possibly finishing work such as plumbing and wiring
Bratislavske instalacni zavody	Bratislava	
Main Administration for Engineering Construction		
Hydrostav	Bratislava	Hydroconstruction
Trat druzby	Kosice	Railroad construction
Ingstav	Bratislava	Engineering construction

Enterprise	Location	Function
Slovak Commissariat of Construction (Continued)		
Main Administration for Manufacture of Construction Materials		
Prefa	Bratislava	Manufacture of construction materials, type unknown

S-E-C-R-E-T

APPENDIX B

METHODOLOGY

An index of construction in Czechoslovakia for the period 1948-55, with 1948 as the base year (1948 = 100) [redacted] is apparently based on data for the value of construction output in constant prices of 1953. [redacted] in 1948-55 total construction and assembly work amounted to 107.5 billion koruny.

50X1

50X1

The given index was first converted to a 1955 base (1955 = 100). Index numbers for the 8 years, 1948-55, were then totaled, and the index number for each year was computed as a percentage of the total. This percentage was then applied to the figure 107.5 billion koruny to determine the value of construction output for each year at 1953 prices.

[redacted] construction output in 1948, at constant prices of 1947, was 60 percent greater than in 1947. This ratio was used to link values for 1947 to the index. The figure for the value of construction output in 1938 was determined from the relationship of the index numbers for 1938 and 1947.

50X1

S-E-C-R-E-T

Page Denied

Next 8 Page(s) In Document Denied

SECRET

SECRET