

Current Support Brief

POOR QUALITY OF CONSTRUCTION IN THE USSR
CONTRIBUTES TO FUTURE PROBLEMS



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POOR QUALITY OF CONSTRUCTION IN THE USSR
CONTRIBUTES TO FUTURE PROBLEMS

The poor quality of construction in the USSR has long been recognized by Soviet authorities to be a significant problem. Recent eyewitness reports by qualified Western observers and surprisingly candid articles in the Soviet press provide fresh insight into the nature of this problem and indicate that the USSR is increasingly aware of the need to improve the materials and technology of construction. Poor construction practices will force the Soviet authorities to make larger outlays for repair and maintenance or to allow buildings to deteriorate and be withdrawn from service earlier than would be normal for well-built and well-maintained structures. Poor construction also gives foreigners a very unfavorable impression and creates a measure of discontent among Soviet citizens. On the other hand, projects of highest priority in the Soviet construction program -- that is, projects of major importance to the development of key industries and advanced weapons systems -- generally would be of relatively good construction, at least functionally.

1. Criticism by US Delegation

The delegation of US construction men who made a 10,000-mile tour of the USSR this year surveying industrial, hydroelectric, housing, highway, and subway projects characterized Soviet construction as being of generally very poor quality.* The delegates, although aware of the painfully unattractive appearance of the monotonous, poorly built structures, were more concerned with making an evaluation of the quality of the basic construction. One delegate stated that with few exceptions the construction which the delegation was shown by the State Committee on Construction Affairs (Gosstroy) would not pass inspection in the US. The quality of materials, skill of labor, availability of power tools and modern

* The photographs in Figure 1 and 2 (following p. 2) are typical of the quality of construction at some of the sites chosen by the USSR to show the US delegation. When the delegates departed from the planned itinerary, they found some construction that was even worse.

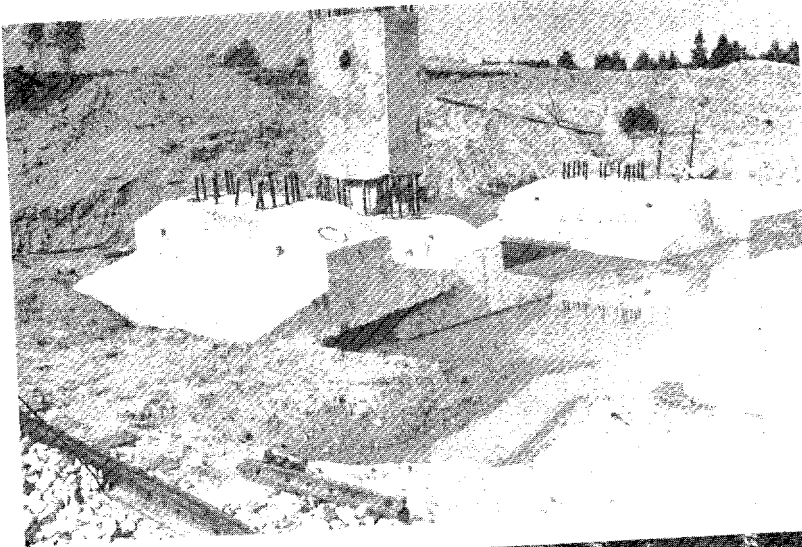
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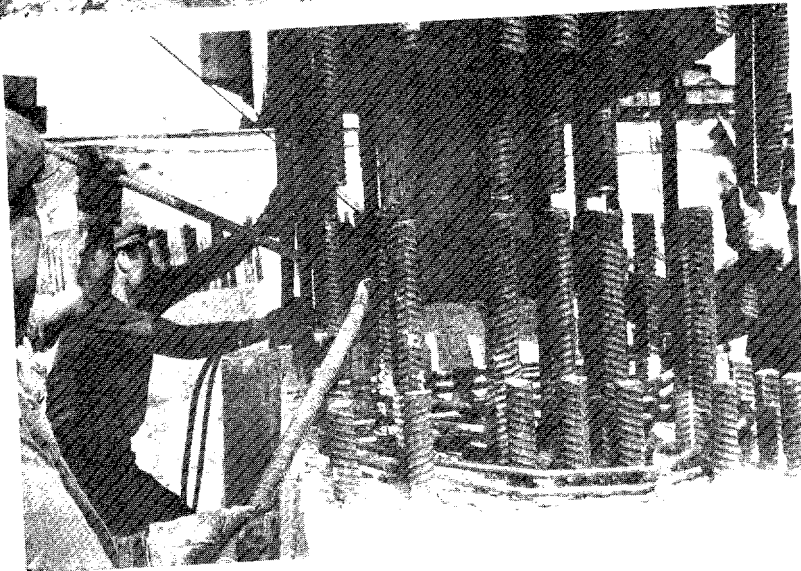
equipment, supervision on site, and quality control were all criticized. The delegates were critical of the basic structure (foundation, walls, and roof), which would require extensive repairs in the future. They did not think, however, that the structures themselves would collapse because of deficient engineering or workmanship. On the other hand, they were harshly critical of the finish (especially outside and inner wall surfaces and flooring) and the plumbing and wiring, contending that the work was so poor that a great deal of expensive repair work and replacement would have to be done in order to maintain the buildings in proper operating condition.

In sharp contrast to this general characterization, however, was the view of the delegates that a few high-priority projects which they saw were well executed. The Bratsk hydroelectric power project and the Irkutsk aluminum plant, for example, were rated as relatively good. Clearly these projects reflect the work of well-trained engineers, good designers, and competent organizers and managers, and they demonstrate that Soviet builders have the capability to perform creditable work on almost any kind of selected project. The lack of depth of such a capability, however, is apparent from the observations of routine industrial and civic projects and housing, where the quality of construction decreases in approximate proportion to the decrease in priority.

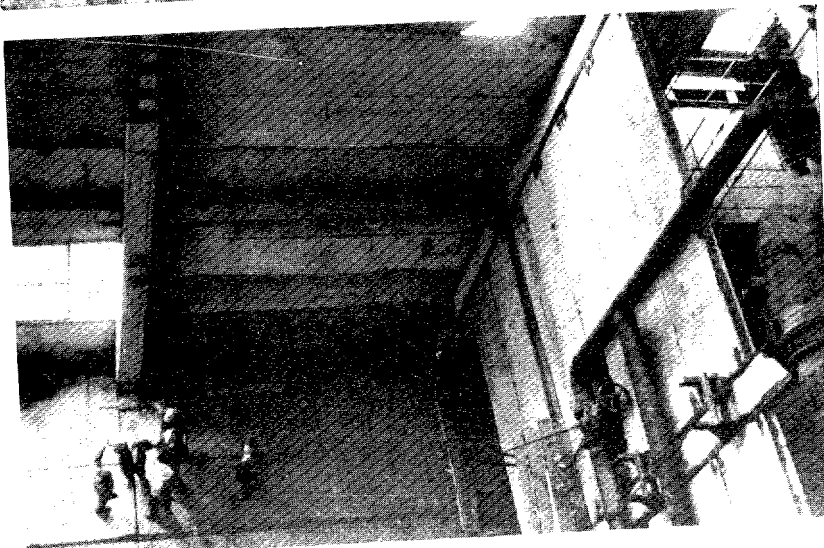
This judgment is consistent with that of earlier delegations, which concluded without reservation that Soviet construction was unbelievably poor. The harsher judgment by previous groups probably is the result of their exposure being limited mainly to housing construction and to the early stages of research and development programs. The 1963 delegation, on the other hand, had the advantage of a schedule calling for exposure to a far broader array of construction, including a number of high-priority projects. In addition, the 1963 delegation profited from the improved international relationships, for their Soviet hosts were much more willing to satisfy spontaneous requests to see projects that had not been included in the schedule. Thus the most recent judgment of US construction men is based on wider observation but nevertheless agrees with earlier judgments.



Thermal Electric Powerplant Under Construction at Konakovo, Kalininskaya Oblast. Note the disorderly house-keeping practices; the use of precast rather than poured-in-place concrete footings; and the failure of the reinforcing bars of the column to match those of the footing, making it difficult to weld the bars together.



Thermal Electric Powerplant Under Construction at Konakovo, Kalininskaya Oblast. Reinforcing bars do not match, and most of them do not even meet, making it impossible to weld the footing to the column properly (it is the usual US practice to provide an overlap equal to 20 times the diameter of the bars; in this case the bars were 1-1/2 inches in diameter).

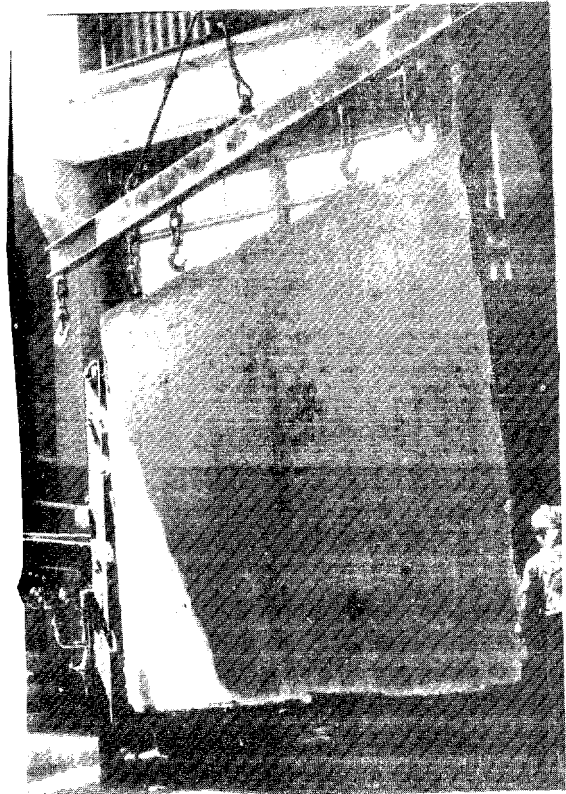


Thermal Electric Powerplant (TETs 21) Under Construction at Moscow. View from the top of the boiler; note the uneven joints of the precast concrete wall panels, a result of inattention to details in casting the panels.

Figure 1. Illustrations of Faulty Construction Practices at Konakovo and Moscow, USSR (CONFIDENTIAL)



Cancer Research Center Under Construction at Leningrad. Mortar joints are not filled and pointed, thus allowing moisture to collect between the bricks where the freeze-thaw cycle will cause damage to the exterior wall. Note also the large batch of mortar dumped on the ground and the piles of rejected bricks -- further evidence of shoddy workmanship and sloppy housekeeping.



Precast Concrete Plant in Tashkent. The precast concrete wall panel has an uneven surface and rough edges, a result of improper concrete mix and dirty forms.



Road Under Construction at Bratsk. Wooden forms and crude screen are used; the concrete mix is delivered in an open truck; soil compaction is being performed only 300 feet in advance of the concrete.

Figure 2. Illustrations of Faulty Construction Practices at Leningrad, Tashkent, and Bratsk, USSR (CONFIDENTIAL)

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2. Soviet Criticism

Soviet criticism of domestic construction, although frequent, usually is less harsh and not so general as that of the US delegation; therefore, it is significant that two recent articles imply that construction of poor quality is both widespread and current. The first article, from the December 1962 issue of Na stroikakh Rossii (At the Construction Sites of Russia), discusses six structural failures of apartment houses in 1961 and five such failures in 1962 at widely scattered locations in the RSFSR. The second article, from the April 1963 issue of Stroitel'stvo i arhitektura (Construction and Architecture), gives details of the structural failure of an apartment house in Odessa and refers to the failure of industrial buildings in more than three locations in the Ukrainian Republic (see Figures 3 and 4*).

In the first article the structural failures are attributed mainly to incorrect practices in laying brick in the winter time, to a series of poor construction practices, and to substandard materials. The failure occurred in the spring because of the poor quality of the mortar and because of inadequate temporary shoring of the load-bearing members. Other deficiencies probably just as applicable to year-round construction as they are to winter work include poor joining of structural units, close load tolerances, revision of design on the site, inadequate use of cement in the mortar, and brick that failed in 30 to 40 percent of the checks to meet specifications. Also noted is laxness in on-site testing of materials and supervision of construction.

Although the second article deals with only one failure, its applicability is considerably broader because it suggests that the detailed analysis of that failure should serve as a lesson to builders, clients, and quality-control personnel; because the failure was not related to construction in winter time; and because of the pointed connection with the several "serious collapses" of industrial structures. The article summarizes the reason for the failure as "the flagrant violation of the technical conditions and regulations in construction and the divergence from the design." "Taken together," the article continues, "these factors led to the sharp reduction

* Following p. 4.

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of the load-bearing capacity of the pillars of the first floor, which collapsed and caused the subsequent collapse of the central section of the building." Specific charges revealed weak organization and supervision, the use of brick that was more than 25 percent below specification, extremely poor masonry work, careless reinforcing work, and shimming with weak materials of the bearing surface of major structural members. In addition, a number of other defects uncovered by the investigation probably could be regarded as not unusual even though they were not related to the failure.

Backing up these two articles concerning structural failures are many more articles from the Soviet press that are critical of the quality of selected aspects of construction in the USSR. From these articles it can be concluded that the general level of Soviet construction is at least as poor as the US delegates judged it to be.

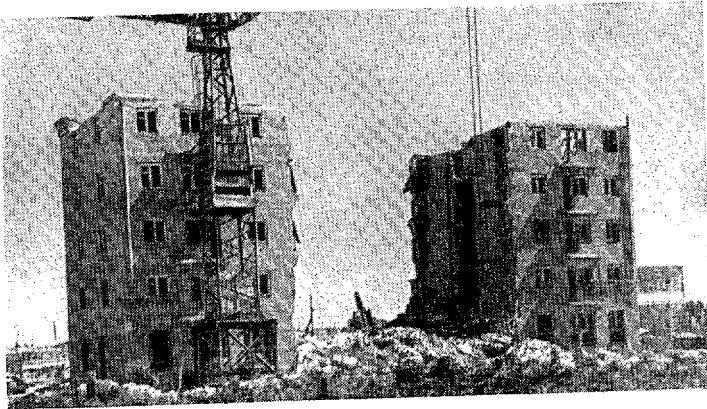
In the past the Soviet leaders have acknowledged that the quality of construction in their country was poor and have recognized the need to effect improvement. They decided, however, that there was an overriding short-run need for industrial structures and housing, and, therefore, they allowed the continuance of construction of poor quality. This policy was restated by a Soviet engineer, who confided to a member of the recent US delegation that the aim in the USSR has been to put up buildings that would serve for at least 10 years, after which it was expected that the rapidly growing construction industry would be more able to cope with the requirements for new construction. Thus the situation in the USSR is roughly similar to that prevailing in the US during World War II, when quality was sacrificed for speed in construction.

3. Conclusions

The USSR is compounding its problems by overlooking or ignoring needed repair and maintenance work on existing buildings. This tendency, which has been reported frequently by numerous Western observers, also is characterized by the low ratio of expenditures for repair and maintenance to those for new construction, probably no higher than 1 to 6 in the USSR compared with a ratio of more than 1 to 3 in the US.

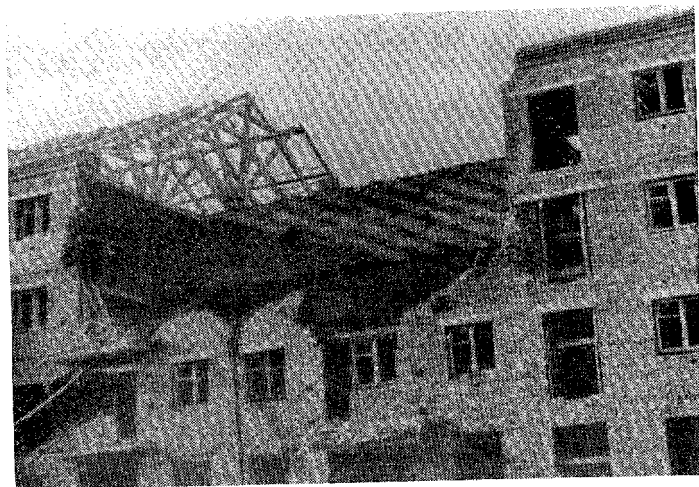
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Partial collapse of an apartment house in Kovrov

Collapse of the central part of an apartment house in Kuybyshev



Collapse of part of the wall and floors of an apartment house in Vladimir

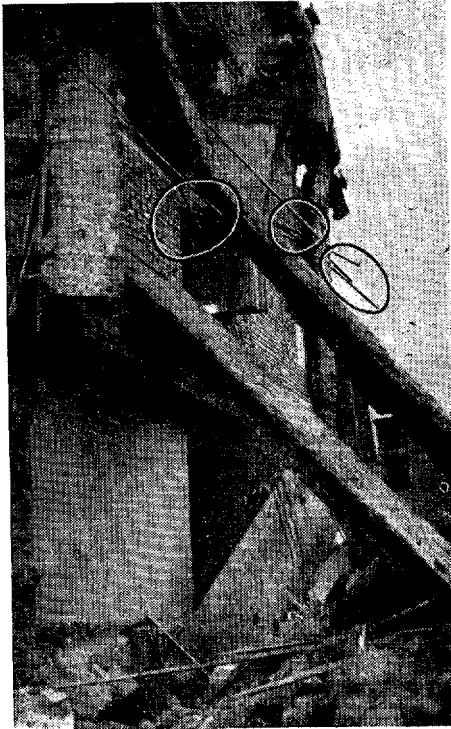
Figure 3. Illustrations of Faulty Work in the Soviet Construction Journal *Na stroikakh Rossii*, December 1962 (UNCLASSIFIED)



The structural failure at Odessa



The absence of a tie-in of the cross wall to the outside wall at the Odessa failure



Rods that were not welded at the reinforcement joint between stories at the Odessa failure



Careless bricklaying in a first-floor pillar at the Odessa failure

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Recent changes in the quality of construction in the USSR are difficult to evaluate because of the differences in the itineraries and personnel of the 1960 and 1963 delegations and the inconsistency of Soviet publication policy. Furthermore, the trends are even more difficult to ascribe to a specific cause. A careful comparison of the judgments of US delegations and the contents of Soviet construction journals, however, indicates that at most only a negligible increase in the quality of construction has been achieved during the past 3 years. It is significant that no notable improvement was made in spite of the conclusions by US delegates in both 1960 and 1963 that there was ample room for improvement, much of which could be effected cheaply. The probable cause of the lack of progress was the extreme pressure to reduce costs and at the same time to increase the volume of construction. In the years to come it appears that strains caused by the continued effort to meet the urgent need for more construction -- housing and industrial -- will hinder any serious attempts to make substantial improvements in the quality of Soviet construction.

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