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Repairs of Vertically Deflected Buildings

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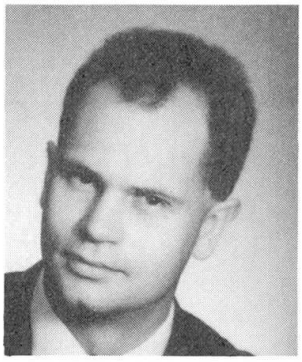

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Summary

The paper presents methods of rectifying vertically deflected buildings and particularly rectifications with the use of hydraulic jacks. The paper contains the characteristic of the method, its comparison with other methods used so far as well as depicts the scope of works necessary to perform rectification. Both the cost-benefit study and the social aspect speak for rectifying buildings by means of the method presented in the paper.

Keywords: deflected buildings, deflections eliminating, surface deformation

1. Methods of eliminating deflections

Mining exploitation results in surface deformation - deformation of a continuous character. The deformations are represented by a number of parameters. The most essential of them influencing the mining area buildings are: strain, mining subsidence, slope, curvature.
Due to its special character , deflection has always been a problem difficult to solve.
Methods of eliminating deflections can be divided into two groups. The first one consists in ground removal from under the part of the building which is placed higher (Fig. 1a), the other one - in lifting with the help of servo-motors (Fig. 1b).
Within the second method of rectifying deflected buildings two ways were practically used.
The first one is rectification with the help of individually operated hydraulic servo-motors. In that method the servo-motors are centrally operated from one oil pump and the steering takes place through force extortion in each jack individually. Precision is crucial in that process, since the success of the operation depends on the experience and the intuition of the person operating the jack. Up to 1997, 20 family houses had been rectified in the Rybnik Mining Company area by using that method.
The other way in the group of methods being discussed is the usage of computer operated hydraulic jacks to rectify buildings. By means of apparatus specially designed for that purpose, proper relocation is forced in each of the jacks. The last four years saw 80 buildings rectified that way in the Rybnik Mining Company area. Two of the above described methods of building rectification are being used side by side, therefore they will be described in detail.

2. Building rectification through lifting

Each object meant for rectification requires a number of preparatory works. The pre-rectification works last about a week and comprise hewing out the servo-motor recesses, cutting off the central heating, gas and water-sewage systems, propping the window- and door- heads and building in the jacks in the cellar storey.
For the time of the rectification the building is specially protected. The most common protection

is two channel bars running on both sides of the torn walls. Fig.2 shows built in jacks in cellar storey.

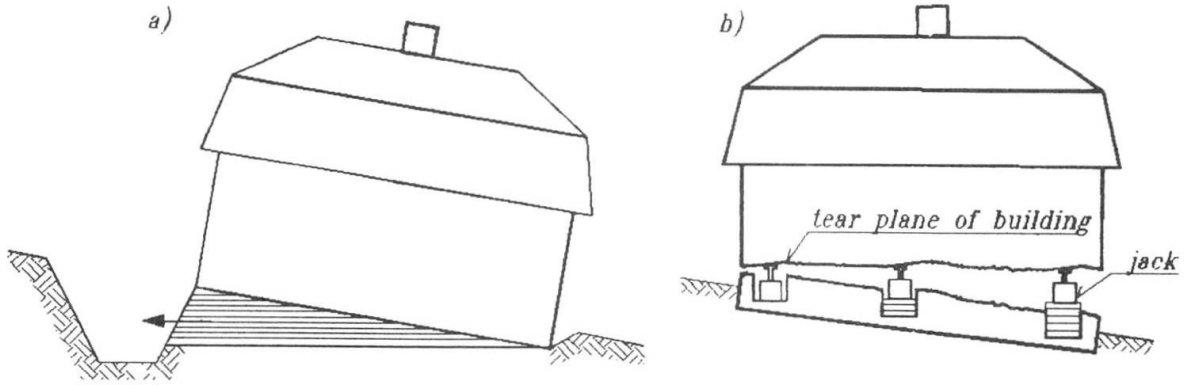

Fig.1 Methods of buildings rectifications

Fig.2 Built in jacks in cellar storey

The process of rectification of the building comprises three stages. During stage one the building is being torn. Stage two is parallel lifting. Levelling stage is the essential rectification stage and it resolves itself into non- uniform lift of the building.
Rectification of buildings is a very interesting issue from the technical point of view. One should keep in mind, however, that it is mainly a social problem. So far, buildings deflected by more than 7% had been dislodged and demolished. Nowadays, thanks to the rectification prospect, they are not demolished but their utility value is fully restored. Thus, there is no need to rehouse people. Inhabitants of Silesia can keep living in their households which , very often, they had built by themselves.
Presented method of rectifying buildings through lifting allows to quickly and faultlessly eliminate mining damage effects such as building deflection, thus preventing them from being demolished or collapsing.
The rectification process is cost-effective both from the economical and the social point of view.