
Strengthening and Rehabilitation of a Heating Plant Chimney, in Poland

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Abstract: A case study of reinforced concrete chimney repair, strengthening, and finally general modernization is described. The specific local conditions and the changeable decisions of the user caused the application of three different approaches to the reconstruction works.

Keywords: concrete destruction; construction faults; repair methods; reinforced concrete chimney; modernization processes; advanced strengthening methods.

6.1 Introduction

This paper describes a case study of a reinforced concrete (RC) chimney structure, over 80 m high, which has been repaired and reconstructed in a series of actions, particularly in three distinct stages.

The history of the RC chimney in the town heating plant goes back to 1976 when it was erected. From the beginning it had several defects. The chimney is situated in a seaside resort and serves as the only heating plant in the vicinity. The heating plant is responsible for heat and hot water supplies for the town of 45 000 people. The town includes a big spa district.

The chimney was designed and erected as a cylindrical shaped, RC structure of 80.5 m height. The outer diameter was 4.16 m and the inner diameter was 3.20 m. The total thickness of the wall consisted of a RC wall of the chimney carrying shaft 0.22 m thick, a heat insulation layer 0.12 m made of granulated slag, and a constructional reinforced wall of an exhaust gas conduit made of refractory concrete 0.14 m in thickness (*Fig. 6.1*). Both walls were erected simultaneously in double slip-shuttering. This detail influenced the quality of construction. The time of concrete setting in both shells was of particular importance. The contractor of the structure adjusted the speed of the boarding slide to the setting conditions of the refractory concrete in the inner shell. As a result, the concrete in the outer carrying shell showed numerous defects.