

Anthony Nicastro  
Structural Option  
Advisor: Walter Schneider  
110 Third Avenue  
110 Third Avenue  
New York, NY 10003  
11/21/05



# Structural Technical Report 3

## Lateral System Analysis and Confirmation Design

### 1.1 Executive Summary

This report includes a design study of the lateral system in 110 Third Avenue. In the first technical report, wind and seismic loads were calculated and subsequently, in this report, they will be applied to the building to determine if the lateral resisting system is adequate. In essence, this report is an extension of Technical Report 1 and will examine the details of the lateral resisting system. Each load case and each direction for wind and seismic loading are summarized and analyzed for their affect on the structure. Worst case scenarios are evaluated to determine whether the building can handle the given loading, and serviceability issues are also examined.

A computer model was generated in ETABS to assist in the evaluation of lateral loading on 110 Third Avenue. Upon first glance, 110 Third Avenue appeared to resist lateral loads solely through the use of shear walls. The ETABS model, after producing abnormally large drifts (although strangely still within seismic code limitations), presented serious serviceability issues. Further examination of the lateral system showed that designers must have used a combination system that utilized the slab and columns in a moment frame.

The report shows that the lateral system was competently designed, although using ETABS did not necessarily demonstrate exact loading and resisting conditions. The difference in results using computer models is clearly explained from the different approach a combination system takes. The use of the combined frame and shear wall reduces lateral movement for a given size and reinforcing of shear walls.