



Building Systems to be Altered

STRUCTURAL SYSTEM

The Helena is composed of two different load resisting systems, gravity and lateral. For the purpose of this analysis, only the components of the gravity load resisting system will be considered.

The main component of the gravity load resisting system consists of reinforced concrete columns placed around the perimeter of the building as well as throughout the floor plan. The columns are to be made up of normal weight concrete with a 28-day ultimate strength of 8000 psi from the sub-cellar up to and including the 18th floor, 5950 psi from the 19th floor through up to and including the 28th floor, and 5000 psi for all columns at and above the 29th floor.

Supported by the columns in the system is a flat plate slab which makes up the existing floor system for The Helena. The cellar and ground floor are made up of a 12" flat plate slab and all the residential floors are supported by 8" flat plate slabs. Compressive strength for the slabs is to be 5950 psi up to and including the 20th floor and 5000 psi for the 21st floor and above.

Currently, the foundation is designed with spread and monolithic footings. The footings are to bear on undisturbed rock with a capacity of 40 tons per square foot. Some of the footings are also further reinforced with 100-ton rock anchors.

MECHANICAL SYSTEM

The current set up of the mechanical ducts is based on the location of the reinforcement in the flat plate slab. Sizing for the ducts is also based on the ability for the ducts to vertically pass between the bars of reinforcement traveling horizontally in the slab to provide support.
